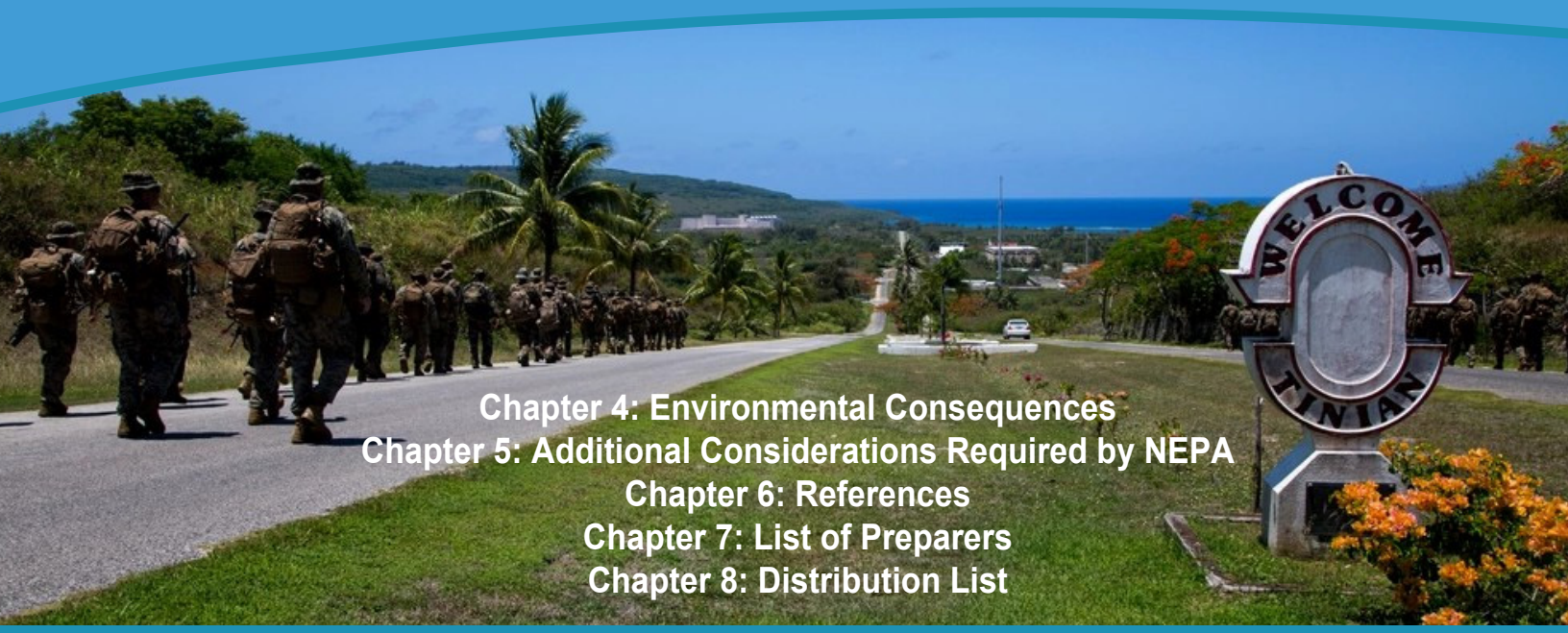
Revised Draft Environmental Impact Statement

Commonwealth of the Northern Mariana Islands Joint Military Training



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Revised Draft Environmental Impact Statement in Support of the Commonwealth of the Northern Mariana Islands Joint Military Training Environmental Impact Statement

CHAPTER 4 ENVIRONMENTAL CONSEQUENCES
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June 2025

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4 ENVIRONMENTAL CONSEQUENCES

This chapter describes potential direct, indirect, and cumulative environmental consequences associated with the No Action, and Proposed Action Alternative 1 and Alternative 2. This chapter is divided into 14 resource areas as discussed in Chapter 3. Management measures are described as appropriate in each and how they serve to lessen impacts. Management measures include avoidance and minimization measures, best management practices, and standard operating procedures. Management measures would be incorporated into the Proposed Action and are common to all alternatives (refer to Appendix D).

4.1 Public Access

Public access to the Military Lease Area on Tinian has been identified as an economic issue of importance to the local community, as it supports subsistence activities, tourism, recreation, ranching, and cultural traditions. The Proposed Action would involve conducting training events in the Military Lease Area throughout the year that vary in size, frequency, and duration (Table 2.1-1) and that take place in different training areas (Figure 2.1-2). In general, small events would occur most frequently throughout the year and have a relatively short duration (approximately one to two weeks or less), medium events would occur less frequently (approximately once per quarter) and also last approximately one to two weeks, and large events would be the least frequent (approximately 2 to 4 times per year) but have a longer duration of approximately two to four weeks. Small, medium, and large training events may overlap, with up to 1,000 service members participating in training on Tinian at any one time. While training events would necessitate temporary and controlled access restrictions for public safety, these limitations would be intermittent, and efforts would be made to minimize disruptions. This chapter examines the potential impacts of the Proposed Action on public access and outlines measures designed to reduce disruptions while supporting military training objectives.

4.1.1 Approach to Analysis

This analysis focuses on the effects of military training on public access within the Military Lease Area and offshore surface danger zones associated with training at the Multi-Purpose Maneuver Range. This analysis of public access considers the potential impacts of temporary access controls on fishing, boating, subsistence, tourism and recreation, ranching, and cultural activities given training frequency, duration, and geographic extent.

4.1.2 No Action Alternative

Under the No Action Alternative, there would be no change to the type, frequency, or duration of ground and aviation training within the Military Lease Area. The public would be able to access the Military Lease Area with current restrictions, and training events would be conducted with the same advanced notice provided to the public as currently occurs. Subsistence activities, tourism, recreation, ranching, and cultural practices could continue to be conducted as needed with no change to the existing availability of the Military Lease Area for public access.

4.1.3 Alternative 1

4.1.3.1 Training

Under Alternative 1, land-based training events would continue and would increase over the No Action Alternative by approximately 15 percent. This alternative would introduce temporary and controlled access restrictions to the training areas and live-fire ranges within the Military Lease Area to ensure public safety during military training events. Because training units need the ability to operate in darkness and low-light conditions, training events could extend over a 24-hour period. All controlled access restrictions would be temporary and intermittent, lasting only as long as required for the training activity taking place in that area.

As described in Chapter 2 of this Revised Draft EIS, the Military Lease Area would be divided into eight smaller training zones (Figure 2.1-2) to allow Range Control to designate selective closures to safely accommodate both training and public access. On any given day, the location and duration of controlled access could vary considerably with some training zones in the Military Lease Area remaining accessible to the public even while training is being conducted in others. For example, larger training events could result in controlled access to multiple and/or adjacent training areas at one time and/or for portions of multiple days. Medium and smaller events could require controlled access to one training area or even require no access restrictions. The duration of restrictions to access could range from hours within one day to multiple full days, depending on training requirements. The USMC anticipates that some non-live fire ground training could be safely accomplished without any restrictions within the Military Lease Area.

When live-fire training is scheduled at the Multi-Purpose Maneuver Range, the USMC would activate a surface danger zone that extends over both land and offshore waters at the northern tip of Tinian (Figure 4.1-1). These restrictions are necessary to protect public safety, particularly when live ammunition is in use. The surface danger zone in effect would depend on the type of ammunition used:

- 5.56 millimeter ammunition: surface danger zone extends about 1.1 miles offshore (used approximately 70 percent of the time)
- 7.62 millimeter ammunition: surface danger zone extends about 2.5 miles offshore (used approximately 20 percent of the time)
- 0.50 caliber ammunition: surface danger zone extends about 3.2 miles offshore (used approximately 10 percent of the time)

This tiered surface danger zone approach ensures that only the minimum necessary area is restricted during each event. A combination of radar feeds and spotters would be used during training events. Should spotters observe a non-participating boater, vehicle, or person approaching the surface danger zone, or an aircraft approaching in the overlying airspace, all live-fire training in the Multi-Purpose Maneuver Range would cease until the non-participant is out of the area. When the Multi-Purpose Maneuver Range is active, access restrictions would include:

- Access restrictions when the Multi-Purpose Maneuver Range is active include controlled entry into training area D and portions of training area C (Figure 2.1-2), with temporary limitations on hunting, foraging, and recreational use.
- Fishing and boating restrictions in the offshore surface danger zones would require vessels to reroute around the surface danger zone (Figure 4.1-1).

Similarly, when the Explosives Training Range is in use, the areas surrounding the surface danger zone would be closed to public access (Figure 4.1-1). In some of these cases, other areas of the Military Lease Area could be open to the public but would require a different access route to avoid the surface danger zone. When the Explosives Training Range is active, access restrictions could include:

- Temporary access restrictions on subsistence activities such as hunting and foraging in training areas B2 and A2.
- Controlled access to some tourism and recreational areas in training areas B2 and A2.

The ammunition holding areas are designated sites within the Military Lease Area where live ammunition and explosives are temporarily staged before being used in training exercises. Due to the potential hazards associated with staging live ordnance, explosive safety quantity distance arcs are established around the ammunition holding areas to protect the public. These restrictions would be temporary and localized to the explosive safety quantity distance arcs surrounding the holding areas. Staging live ammunition at the Base Camp ammunition holding area (AHA 2) would not result in additional public access restrictions because the explosive safety quantity distance arcs are fully within the boundary of the Base Camp. When live ammunition is staged at the ammunition holding area near the Multi-Purpose Maneuver Range (AHA 1), the areas encompassing the explosive safety quantity distance arc would be closed to public access (Figure 4.1-2). When live ammunition is staged at AHA 1, access restrictions could include:

- Controlled access within the explosive safety quantity distance arcs.
- Temporary restrictions on subsistence activities (e.g., hunting, foraging, and gathering of culturally significant plants) within the explosive safety quantity distance arcs.
- Temporary closures or detours of roads located within the explosive safety quantity distance arcs.

Fishing and Boating

As discussed above, when live-fire training is occurring in the Multi-Purpose Maneuver Range, the military would activate one of three surface danger zones that extend over the ocean surface northwest of Tinian. The resulting in restrictions on fishing and boat traffic in that area for the duration of the training event (Figure 4.1-1). The temporary closure of offshore waters during live-fire events could result in rerouting vessel traffic by approximately 2 to 4 miles, potentially increasing fuel use, travel time, and exposure to rougher seas. However, local mariners often already avoid these nearshore areas due to natural hazards, including shallow reef structures and strong currents and around Puntan Taddong at the northern tip of the island (Marianas Visitors Authority 2025; R. Dela Cruz Jr., Personal Communication, 2025; R. Sablan, Joint Region Marianas, Personal Communication, 2025). Many boats typically navigate at safe distances ranging from 500 feet to over a mile offshore, which often coincides with or exceeds the boundaries of the smallest surface danger zone used. To minimize these impacts the USMC would provide advance notification through multiple channels, ensuring that fishers and boaters can plan around closures and minimize disruptions to their activities. In addition, USMC would collaborate with the CNMI and Tinian leadership to identify dates and locations for fishing tournaments or other events requiring use of the offshore areas surrounding the Military Lease Area.

Figure 4.1-1 Surface Danger Zones

Figure 4.1-2 Explosive Safety Quantity-Distance Arcs

Restored Public Access

During operation of the USAGM facility on Tinian, shore fishing along Lamanibot Bay from Puntan Lamanibot Sanhilo (Sanhilo) to Puntan Lamanibot Papa was restricted due to hazards from electromagnetic radiation. With USAGM closing operations and USMC utilizing the site for Base Camp, access to fishing in these areas would no longer be restricted.

Subsistence

Subsistence activities occur throughout the Military Lease Area and locations vary depending on seasons and weather. Access to hunting and foraging areas may be temporarily restricted when training events are active, which could temporarily affect the ability to gather coconut crabs, wild yams, medicinal plants, and other culturally significant resources, depending on the training zone closed and the location of these natural resources. To minimize disruptions, access controls would be lifted as soon as possible after training concludes, and coordination with the local community would ensure training schedules align as much as possible with important subsistence activities. For more information about scheduling and temporary closures see section 2.1.8.3.

Tourism and Recreation

Live-fire training at the Multi-Purpose Maneuver Range would not restrict public access to the historic Atomic Bomb Loading Pits and beach access areas would remain largely open, such as Marine beach, Unai Chulu, and Unai Chiget. However, there may be brief and infrequent disruptions during active training periods. The surface danger zones would not affect popular dive sites around the island. However, as described in the Fishing and Boating section above, the temporary closure of offshore waters during live-fire events may result in rerouting vessel traffic by approximately 2 to 4 miles further offshore to safely navigate around restricted areas, resulting in minor increases in travel time and fuel use.

Tourism events such as the Tinian Hot Pepper Festival in February, the San Jose Fiesta in May, the Chief Taga Festival in October, and World War II commemorative events may utilize the Military Lease Area for hunting and gathering of food leading up to the event or for specific activities in the Military Lease Area during the event. USMC would collaborate with the CNMI and Tinian leadership to identify dates and locations for significant events requiring use of the Military Lease Area.

Agriculture and Ranching Activities

Current ranching activities would be minimally affected by training events. Ranchers would continue to have access to their cattle, and training operations would not alter or interfere with actively used agriculture areas. To minimize disruptions, the USMC would ensure that training activities do not interfere with grazing cattle and would provide clear detour information to affected ranchers during active training periods.

Access to Memorials, Sacred Sites, and Traditional Event Locations

Access to memorials, sacred sites, and traditional event locations in the Military Lease Area that are used by the community may be temporarily restricted when training is underway, depending on the type of training being conducted and the need to safely separate civilian access. For example, during live-fire training at the Multi-Purpose Maneuver Range, the public would be unable to access the memorial at Puntan Taddong. Some access-controls may alter travel routes to

avoid locations of military training. To reduce public access impacts to memorials, sacred sites, and traditional event locations, the on-island Range Control staff would work with local leaders to schedule training around major cultural events and ensure that access is restored as quickly as possible. For additional information on impacts to Cultural Resources, please see Section 4.5.

Minimizing Impacts to Public Access

The Proposed Action was developed by first identifying the training requirements necessary to support joint military operations. In coordination with the CNMI, the USMC then refined the training approach to minimize the effects of temporary and intermittent controlled access restrictions on civilian use of the Military Lease Area during training. Specifically:

- The Multi-Purpose Maneuver Range and the Explosives Training Range were sited within the Military Use Area such that public access would be allowed to the atomic bomb loading pits within the North Field National Historic Landmark. Public access to recreational beaches (e.g., Unai Chulu) within the Military Lease Area would be allowed when such access could be safely accommodated.
- The division of the Military Lease Area into eight separate range areas (Figure 2.1-2) would allow Range Control to schedule discreet areas of the Military Lease Area while allowing safe public access in all other areas where training activities would not be occurring.
- The establishment of an on-island Range Control would provide centralized management of the Military Lease Area. Range Control would be responsible for scheduling training, monitoring the conduct of training, and communicate the training schedule within the Military Lease Area to the community through various media. Public access to the specific training areas or zone within the Military Lease Area would be allowed and only restricted when access cannot be safely accommodated.
- During live-fire activities at the Multi-Purpose Maneuver Range, the surface danger zone activated would be based on the types of ammunition that would be used. It is anticipated that the smallest surface danger zone corresponding to 5.56 ammunition would be the most frequently activated because 5.56 ammunition is the most consistent training requirement. Should a non-participating boater, vehicle, or person approach the surface danger zone, or an aircraft approach in the overlying airspace, a combination of surface radar and spotters would notify the Officer in Charge to cease live-fire training until the non-participant is safely out of the surface danger zone.
- The USMC would employ an adaptive management approach—a structured and flexible decision-making process that allows for adjustments over time based on new information and changing conditions. This approach would be used to refine the scheduling of training within the Military Lease Area.

Summary

In summary, under Alternative 1, training would continue and would increase over the No Action Alternative by approximately 15 percent. The size of a training event and the type of training to be conducted would be some of the factors that Range Control would use in determining the locations within the Military Lease Area that the public could safely access when training is actually occurring. Larger training events, which would occur only two to four times per year,

would require larger portions of the Military Training Area and would likely involve the most controlled access. Some training could be conducted without any access controls.

With advanced notification of where, when, and how long training would occur, the public would be aware of and could plan around any temporary access controls imposed in the Military Lease Area. In addition, the local government would be able to work with Range Control to identify holidays, festivals, or other important days for which public access is needed. Moreover, the use of adaptive management by Range Control in scheduling training would allow the military to efficiently and effectively balance safe public access with military training needs. The DoD would maintain paved and unpaved roadways used for training within the Military Lease Area to address any deterioration related to training, which would have a beneficial impact for the public who would also use these roadways.

The Proposed Action would not introduce new military training activities at the Saipan USAGM site. As this area is already subject to access restrictions due to its existing use and security requirements, no changes to current public access limitations are anticipated. The intended use of the site would remain similar, and the level of access restrictions would remain consistent with current conditions. In summary, there would be less than significant impacts to public access from training, with implementation of Alternative 1.

4.1.3.2 Construction

Construction under Alternative 1 would be completed in phases over approximately 10-15 years. Construction would be dispersed throughout the Military Lease Area with most work occurring at the ranges and the Base Camp. Construction activities would slightly increase vehicular delays on roadways and would include temporary detours and/or road closures within the Military Lease Area. These temporary detours and/or road closures would reduce or delay access to publicly used sites in the Military Lease Area. However, any delays would be temporary, intermittent, coordinated with the community, and notice provided in advance. It is anticipated the public would still have access to recreation and cultural sites, agricultural use areas within the Military Lease Area, and roads for hiking, biking, or vehicle use during the construction period. The clearing and improvement of roads in the Military Lease Area would provide additional access to all parts of the Military Lease Area and would enhance both visitor and local experiences driving, hiking, or biking in the Military Lease Area. No construction would be required at the USAGM site on Saipan. As such, Alternative 1 would result in less than significant impacts to public access during construction.

4.1.4 Alternative 2

4.1.4.1 Training

Under Alternative 2, training would continue and would increase over the No Action Alternative by approximately 5 percent and impacts to public access would be similar in type and nature to those described for Alternative 1. As Alternative 1 would have less than significant impacts to public access during training events, and Alternative 2 would have 10 percent fewer training events than Alternative 1, Alternative 2 would result in less than significant impacts to public access during training. Additionally, the minimization measures described for Alternative 1 such as would apply under Alternative 2, which would reduce potential impacts related to public access to the Military Lease Area for tourism, recreation, and subsistence uses as well as access by fishers and

boaters in the waters north of Tinian. Therefore, Alternative 2 would result in less than significant impacts to public access during training events.

4.1.4.2 Construction

Because there would be no difference in the proposed facilities between Alternative 1 and Alternative 2, construction impacts would be the same for Alternative 2 as described for Alternative 1.

4.2 Land Use and Recreation

4.2.1 Approach to Analysis

The analysis of land use and recreation impacts focuses on the compatibility and consistency of the Proposed Action with existing land use plans and policies and recreational uses in and outside of the Military Lease Area.

Compatibility and consistency with existing land use plans, policies, and other agreements was analyzed by comparing land use and management under the Proposed Action to the requirements of: (1) *The Covenant to Establish a Commonwealth of the Northern Mariana Islands in Political Union with the United States of America* (The Covenant), which was approved and became effective on March 24, 1976; (2) the *Technical Agreement Regarding Use of Land to Be Leased by the United States in the Northern Mariana Islands* (Technical Agreement) signed on February 15, 1975; (3) the 1983 Lease Agreement, subsequently amended in 1988, 1994, 1999, and 2023, (4) the 1999 Conservation Agreement in relation to Fish and Wildlife Service Biological Opinion 1-2-98-F-07 and signed in conjunction with the 1999 Lease Amendment, and (5) the 2019 Commonwealth Ports Authority Lease as amended in 2023. This analysis considered proposed land uses identified in the 2019 CNMI Public Land Use Plan Update as the baseline for comparison. Analysis of impacts to recreation considered restrictions on public access to the Military Lease Area from training, along with potential disruptions from construction activities.

4.2.2 No Action Alternative

Under the No Action Alternative, impacts of training on land use would continue consistent with The Covenant, Technical Agreement, and leases. Public access for recreation would not change. As a result, there would be no impact on land use or recreation.

4.2.3 Alternative 1

4.2.3.1 Compatibility and Consistency with Existing Land Use Plans and Policies

Training

Under Alternative 1, the entirety of the Military Lease Area would be used as a training area. Training events would continue and would increase over the No Action Alternative by approximately 15 percent. Ground and aviation training events that would occur in the Military Lease Area would be the same or similar to those currently authorized for Tinian under prior environmental analyses. Alternative 1 would expand training infrastructure to include two live-fire ranges (Multi-Purpose Maneuver Range and an Explosives Training Range), improvements to North Field, 13 Landing Zones throughout the Military Lease Area, and the establishment of a Base Camp, surface radar towers, and other supporting infrastructure.

Non-live-fire training could occur throughout the Military Lease Area. Live-fire training would only occur in the Multi-Purpose Maneuver Range and the Explosives Training Range. No training areas would include the former Tinian Mortar Range and designated areas to protect natural and cultural resources (Figure 4.2-1). Should the proposed Atgidon Landfill site be constructed and permitted, no training would be allowed in that area.

Proposed training in the Military Lease Area and creation of a Live-Virtual-Constructive training environment would be compatible and consistent with Sections 802 and 803 of the Covenant, the Technical Agreement, and the 1983 Lease Agreement, as amended. The Covenant and these agreements specifically provide that the Military Lease Area on Tinian is made available to the U.S. to enable it to carry out its defense responsibilities. In addition, the two proposed live-fire ranges would be located wholly within Military Lease Area, remote from the residential and commercial land uses in the village of San Jose.

The use of 110 acres of cleared area within the former USAGM property for a Base Camp would be consistent with the authorized military use of the Military Lease Area. Training in the Military Lease Area under Alternative 1 would be compliant with existing agreements and would be consistent with the Comprehensive Public Land Use Plan Update (CNMI Department of Public Lands 2019) which identifies this area as set aside for military use and not for public uses.

Some of the proposed Landing Zones and the Base Camp well fields were specifically sited to avoid existing agricultural uses. In addition, the closest training area to the southern Military Lease Area border, Landing Zone 1, is approximately 1.5 miles from private residential property and the potential future homesteads planned for the Kastiyu and Carolina neighborhoods.

Three project components would be located outside of the Military Lease Area: the aircraft shelter, the biosecurity site, and communication towers on Saipan. The aircraft shelter would be consistent with adjacent land uses of the U.S. Air Force Divert airfield facilities and TNI. The biosecurity site at the Port of Tinian would be in an area that is designated as Grant of Public Domain Land and would require a new lease or other agreement with the CNMI Commonwealth Ports Authority. The biosecurity site would function to prevent the spread of invasive pests from incoming vessels. Therefore, the biosecurity site would be compatible with other uses along the port frontage.

The USAGM site on Saipan already contains communications equipment and additional communication equipment at the site would be compatible with the existing land use. Once USAGM functions cease at the Saipan site, a new lease from the CNMI would be required for this location, which is designated as public land.

As described above, project components both inside and outside of the Military Lease Area would be compatible and consistent with existing land use plans, policies, and agreements and would not result in changes to land uses. As a result, training under Alternative 1 has no impact to land use plans and policies.

Figure 4.2-1 Restricted (No Training) Areas Within the Military Lease Area

Construction

Construction of facilities and vegetation clearing under Alternative 1 would not occur within current agricultural areas in the Military Lease Area or near the future homestead areas planned in the Kastiyu and Carolina areas located outside of the Military Lease Area. Existing land use plans and policies allow for construction of military facilities within the Military Lease Area. Therefore, construction and vegetation clearing activities would be compatible and consistent with existing plans. Construction of the aircraft shelter would require negotiation of additional rights under the 2019 Commonwealth Ports Authority lease and amendment of the TNI Airport Layout Plan. The biosecurity site at the Port of Tinian would require negotiation of additional rights with the Commonwealth Ports Authority but would be located on land that has already been cleared, would be compatible with existing surrounding port uses, and would not impede use of the small boat ramp and marina. Placement of additional communication equipment at the former Saipan USAGM site would be consistent with the existing communications infrastructure at the site.

Proposed Landing Zones 2 and 6 (both 600 feet by 600 feet), a new access road to Landing Zone 6 (24 feet wide by 458 feet in length), and a new access road to the Explosives Training Range (24 feet wide by 2,800 feet in length) would be constructed within the 936-acre Natural Resources Conservation Area (Figure 4.2-2). Approximately 19 acres, or 2 percent of the conservation area land use would be affected by the Landing Zones and roads. This impact to the Natural Resources Conservation Area would be coordinated through consultation with the U.S. Fish and Wildlife Service. Habitat impacts are discussed in Section 4.4 Biological Resources.

With successful adoption of new leases and agreements, Alternative 1 construction would be compatible and consistent with existing land use plans and policies and would not result in changes to land use within or outside the Military Lease Area. Therefore, the impact to land use would be less than significant.

4.2.3.2 Recreation

Training

Under Alternative 1, training would continue and would increase over the No Action Alternative by approximately 15 percent, resulting in temporary restrictions on public access to portions of the Military Lease Area. These temporary restrictions could affect visitors' ability to participate in recreation activities within training areas that are temporarily closed for training events. For example, training events conducted on the Multi-Purpose Maneuver Range would result in the temporary closures of land and sea space within the surface danger zones. These closures could affect access to, and use of, recreation sites such as cultural sites, public coastal areas (in-water and shoreline areas), scenic viewpoints, and beaches located within those surface danger zones. During these temporary closures, visitors and boaters would still have access to other beaches, scenic viewpoints, cultural sites, and fishing locations for recreation use. Surface danger zones would not impact popular dive sites around the island (Figure 4.2-3). However, when the Multi-Purpose Maneuver Range is active, boaters may need to traverse around the surface danger zone.

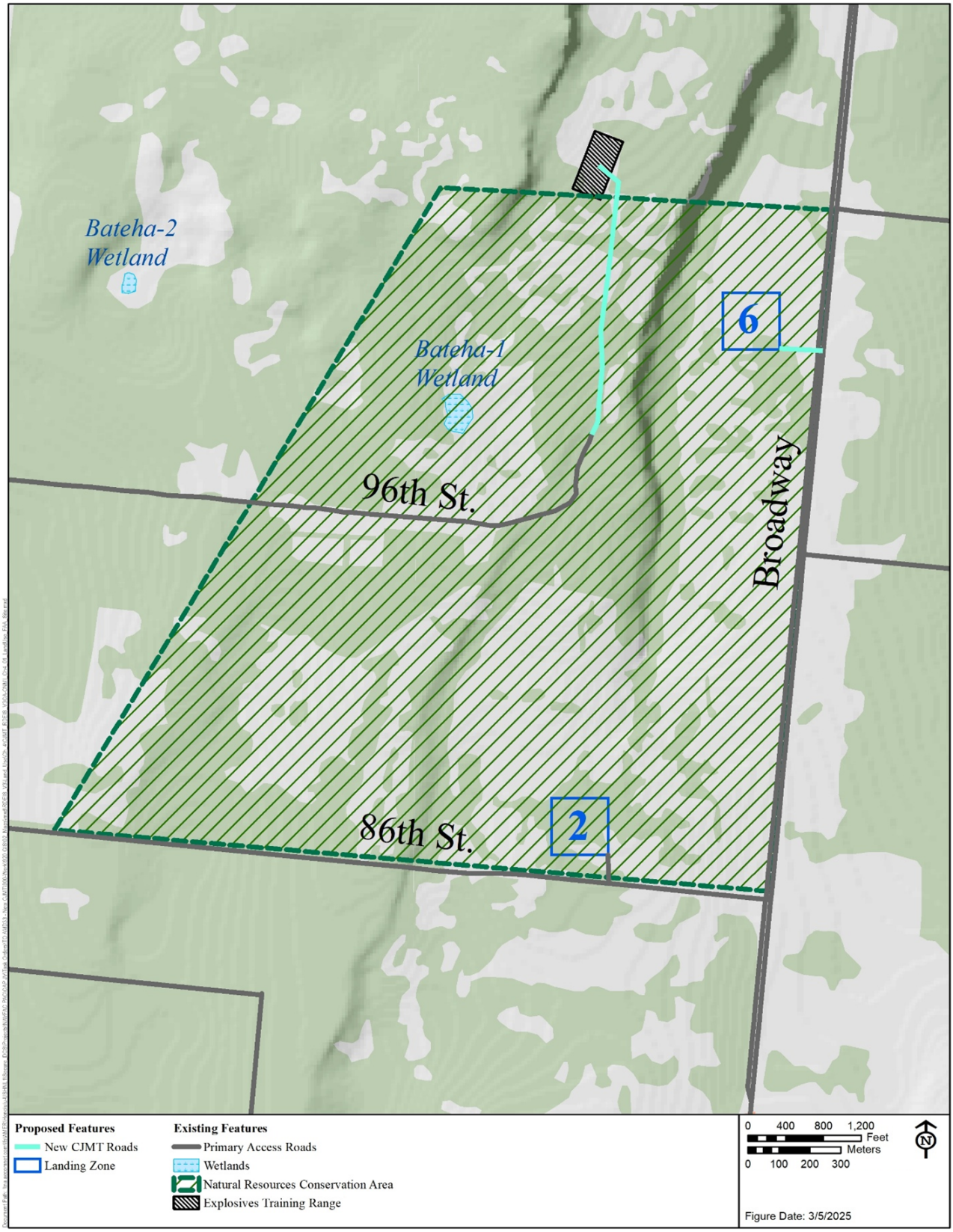

Figure 4.2-2 Proposed Action Features Within the Natural Resources Conservation Area

Figure 4.2-3 Proposed Action Features Near Tinian Dive Sites

Though recreation sites may be open and accessible during training events, the presence of training personnel or equipment may alter the experience for visitors at shrines and memorials, cultural sites, shoreline fishing areas, beaches, and scenic viewpoints. The presence of personnel and/or equipment near any one recreation site would be intermittent and would temporarily change the ability of visitors to participate in public recreation uses. However, there would be other recreation areas unrestricted to the public. As a result, training under Alternative 1 would result in less than significant impacts to recreation.

Construction

Construction under Alternative 1 would not change public recreation uses. However, construction activities, particularly at the Multi-Purpose Maneuver Range, Explosives Training Range, and surface radar sites, may affect visitor experiences at recreational, cultural, or scenic sites where there is a natural and undeveloped recreational setting. These construction impacts under Alternative 1 would be intermittent and temporary, resulting in a less than significant impact on recreation.

4.2.4 Alternative 2

4.2.4.1 Compatibility and Consistency with Existing Land Use Plans and Policies

Training

Under Alternative 2, training would continue and would increase over the No Action Alternative by approximately 5 percent, which is approximately 10 percent less than Alternative 1. Therefore, like Alternative 1 training, Alternative 2 training would also be compatible and consistent with existing land use plans, policies, and agreements and would not result in changes to land uses. Training under Alternative 2 would have no impact to land use plans and policies.

Construction

There would be no difference in facilities construction between Alternative 1 and Alternative 2, so construction impacts would also be less than significant for Alternative 2. Alternative 2 construction impacts would be compatible and consistent with existing land use plans, policies, and agreements and would not result in changes to land use in the Military Lease Area.

4.2.4.2 Recreation

Training

Alternative 2 training would continue and would increase over the No Action Alternative by approximately 5 percent, which is approximately 10 percent less than Alternative 1. This would result in the public experiencing a decrease in the frequency and duration of temporary access restrictions to areas within the Military Lease Area compared to Alternative 1. No other changes to training, including location and types of training, would result from Alternative 2. Alternative 2 would result in less than significant impacts to recreation during training events.

Construction

There would be no difference in facilities construction between Alternative 1 and Alternative 2. Therefore, construction impacts to recreation would also be less than significant for Alternative 2.

4.3 Socioeconomics

4.3.1 Approach to Analysis

The focus of this socioeconomic analysis is on potential changes to economic and social conditions on the island of Tinian with implementation of the Proposed Action. Both qualitative and quantitative techniques were used. Due to the need to maintain flexibility in scheduling proposed training throughout the year, the USMC is unable to estimate the number of days or specific locations of where temporary access controls would occur on an annual basis, and thus a quantitative analysis of specific economic impacts (e.g., potential gain or loss in revenue, amount of additional commuter flights to and from Tinian, number of hotel rooms) would be speculative. Specific information on future hiring or expenditures (e.g., job titles, salary, construction costs) is also not available at this stage of the planning process. Potential economic expenditures from the limited and distributed nature of the construction projects that are proposed to occur over a 10- to 15-year period would be similarly speculative, and thus are addressed qualitatively. Where appropriate, the analysis also identifies where effects could extend more broadly to the CNMI region. The available published data was supplemented by interviews with CNMI government and local agencies.

Specifically, the analysis considers potential impacts to population and demographics; economic activities including shipping, tourism, commercial ranching, fishing, and agriculture; and subsistence activities. Population change alone is generally not viewed as either an adverse or a beneficial impact, but the underlying effect of population change is often noted for its influence on other aspects of socioeconomics. Thus, impacts on social cohesion and public services, namely healthcare and public safety, are also assessed. These economic and social elements were chosen for analysis due to their importance to the local economy and the social fabric on Tinian and within the CNMI at large.

Tourism and commercial ranching or agriculture are important economic activities on the island. Fishing continues to be a way of life and a source of subsistence and revenue for many residents of the CNMI (National Marine Fisheries Service 2018; Western Pacific Regional Fishery Management Council 2023), along with harvesting of land-based natural resources. Many of these resources are found within the Military Lease Area and off the coast of Tinian. Changes in the ability of residents to access the Military Lease Area and the nearshore as a result of the Proposed Action could result in socioeconomic impacts.

The potential impacts from training and construction-related noise to the human environment are discussed in Section 4.8 Noise. Impacts related to air quality are discussed in Section 4.9 and public health and safety impacts from training and construction activities are addressed in Section 4.10.

4.3.2 No Action Alternative

Military training has a decades-long history in the Military Lease Area on Tinian. In recent years, training events have included large and medium events (e.g., Valiant Shield and Cope North) and smaller events. In addition to the service members, training and environmental monitors would arrive at the beginning of events and depart from Tinian when the events are completed.

Access restrictions are generally few and center around North Field, with closure of the taxiway between runways Able and Baker and the two ends of runway Baker. No one is permitted to enter

runway Baker during aviation operations and airdrops. Military camping is conducted on the existing concrete open area north of runway Able, called the North Ramp. The important features in the North Field National Historic Landmark remain open for tourism, including runway Able (M. Cruz, Joint Region Marianas, Personal Communication, 2024).

During training events under the No Action Alternative, the public would maintain the ability to access the Military Lease Area, and Tinian residents would be able continue to conduct commercial ranching activities and gather resources when access restrictions are not required for the safety of the public and the military. Activities in the nearshore area (e.g., fishing) would have no restrictions except in proximity to the two ends of runway Baker while aviation operations are occurring during training. Training events under the No Action Alternative would be conducted at the same tempos as evaluated in previous NEPA documents (DON 2010a, 2015b) and associated consultations and authorizations. With the closure of the USAGM transmitting station on Tinian, USAGM would remove its physical improvements and equipment and restore the site to its previous condition; thus, the site would revert to DON control. Military training would occur within the 300-acre fenced area that was formerly a no training area, and public access in this area would be restored, including shore fishing along Lamanibot Bay from Puntan Lamanibot Sanhilo (Sanhilo) to Puntan Lamanibot Papa.

Construction associated with the U.S. Air Force Divert project (U.S. Air Force 2016, 2020) would continue until complete, estimated by 2026, with the associated short-term direct beneficial impacts to the local economy along with short-term impacts on housing and public services from the construction personnel. After that time, the new infrastructure and facilities at TNI would be used for military divert operations, humanitarian assistance staging, exercises, and other aircraft support activities, which would continue at a similar tempo to the existing training that occurs on Tinian.

Additionally, projects under the U.S. Air Force's Agile Combat Employment program would also continue, which would include the clearance of vegetation and restoration of the runway and other engineered surfaces at North Field. These projects are scheduled to receive funding through fiscal year 2025 and the North Field runways and surrounding area would have the appearance of a working airfield, allowing easier ground and aircraft access to better maintained surfaces with less dense jungle vegetation in and around the immediate runway areas. Improved access to cultural sites in the Military Lease Area, especially related to the North Field National Historic Landmark, would provide a modest benefit to tourism and local residents who would access the area for subsistence practices and enable social cohesion from these practices. Thus, there would be a modest benefit to tourism from improved roadway conditions and setting for those visiting the Military Lease Area, specifically the North Field Historic Landmark, under the No Action Alternative.

For the reasons described, there would be less than significant long-term impacts to socioeconomics under the No Action Alternative.

4.3.3 Alternative 1

4.3.3.1 Training

Population and Demographic Changes

Under Alternative 1, small, medium, and large training events throughout the year would cause short-term and temporary population increases. The number of personnel participating would vary as shown in Table 2.1-1. Large events would be the least frequent on Tinian, occurring approximately 2 to 4 times per year for approximately 2 to 4 weeks at a time (e.g., Valiant Shield) with up to 1,000 service members involved in training on Tinian at any one time. Small and medium events would likely occur more frequently, could overlap, and involve up to 250 personnel.

In the long-term, the hiring of 30 to 50 personnel to manage training events and operate and maintain the facilities and infrastructure in the Military Lease Area (e.g., repair targets and maintain vegetation), could result in a less than significant increase in population, although the USMC intends to hire locally for these permanent positions, wherever possible, based on labor availability and contracting requirements. Hiring would be phased over the approximate 10 to 15-year period as construction projects are completed and the training infrastructure becomes operational, to include the Base Camp, communications system, live-fire ranges, and Landing Zones. Initially, however, approximately 2-5 positions may be filled on a rotating basis by Marine Corps Base Camp Blaz Range Control staff or other federal civilians.

It is anticipated there would be a locally available labor pool of approximately 28 people on Tinian that formerly would have supported the USAGM facilities on Tinian. The USAGM site on Saipan had a small number of full time staff as well, who could also potentially present a locally knowledgeable labor force to support the Range Control towers at the Saipan site. The local economy would experience a modest benefit from the employment related to Range Control and maintenance operations, regardless of whether local or off-island labor is hired. Should local residents be hired, the implementation of CJMT training and the operation of the Base Camp are not expected to induce additional demand for housing or public services. If off-island labor is hired, it would occur gradually over time as the infrastructure in the Military Lease Area becomes operational. During larger or medium training events when additional staff are needed for a short period of time, additional staff could be provided on a temporary basis to support specific needs. Thus, potential long-term impacts to Tinian's housing supply or school enrollment would be less than significant due to the anticipated gradual or phased nature of the hiring.

Effects on Economic Activities in the Military Lease Area

Under Alternative 1, military training would continue to be conducted within the Military Lease Area on Tinian and training activity would increase over the No Action Alternative, by approximately 15 percent. Due to the need to maintain flexibility in scheduling proposed training throughout the year, any quantitative estimates on the number of days or specific locations of closures would be highly speculative in nature. The USMC is committed to ensuring the community can continue to access the Military Lease Area safely while allowing training requirements to be met, to the extent feasible. Depending on the type of training being conducted and the location where training is occurring within the Military Lease Area, residents and others could experience temporary access restrictions in the Military Lease Area and surrounding waters.

These temporary access restrictions could affect members of the community recreating within the Military Lease Area or individuals that depend on the resources available in the Military Lease Area for subsistence gathering and hunting to barter or trade (DON 2018). Under Alternative 1, restrictions on public access to the Military Lease Area would be instituted only when necessary to protect public safety (e.g., provide safe separation from aircraft, military vehicles, or specific hazardous training activities).

The total area affected, location, and duration of access restrictions on any given day would vary and be determined by the type of training scheduled. An important variable that would affect the amount, location, and duration of public access restrictions in the Military Lease Area under Alternative 1 would be the size of the training events. Larger training events could result in public access restrictions to multiple and adjacent smaller training areas at one time and multiple full days, while medium and smaller events could restrict access to one training area or may require no access restrictions. Timing of these access restrictions could range from hours within one day to multiple full days, depending on training requirement needs. It is possible that members of the public could expect to see service members moving through an area on foot, military vehicles parked on access paths, military aircraft flying overhead, or hear noise related to training (e.g., aircraft and weapons firing) when training events are scheduled in the Military Lease Area.

New live-fire training would only occur at the Multi-Purpose Maneuver Range and Explosives Training Range, in addition to the limited small arms training that currently occurs using steel bullet traps within existing structures. As described in Section 4.1.3, for safety purposes when these two ranges are being used for live-fire training, the public would be temporarily restricted from accessing land and ocean areas encompassed by the surface danger zones. Live-fire training events may occur during the daytime or at night. The activation of these surface danger zones would affect economic activities requiring access to the Military Lease Area or any area within a surface danger zone including tourism, shore fishing, and boats fishing or transiting in the waters north of Tinian. The activation of surface danger zones over land at the Multi-Purpose Maneuver Range or the Explosives Training Range would not completely restrict access to Tinian's tourist areas in the North Field National Historic Landmark. Additionally, Range Control would coordinate with local officials regarding the flight schedules for the Tinian and Saipan airports to avoid firing and explosions at live-fire ranges during these times and thus would avoid impacts to commercial air travel during live-fire training.

The portion of the surface danger zone for the Multi-Purpose Maneuver Range that extends over the ocean waters to the northwest of Tinian would result in short-term, temporary restrictions on boat traffic and fishing in that area as long as live-fire training is occurring (Figure 4.1-1). As a result, boat transits from Saipan to the west side of Tinian may incur increased fuel use and travel time to avoid the surface danger zone, as described in Section 4.1.3.1. This restriction could result in fishers choosing to fish in less ideal locations during time of closure or boaters having to transit further north and west of Tinian.

To minimize the potential for adverse impacts on fishing and boating, the USMC has identified three surface danger zones based on the types of ammunition that would be used during live-fire training. It is anticipated that the smallest surface danger zone would be the one activated the most by the military. As described in Section 4.1.3 Public Access, the surface danger zones extend approximately 1 to 4 miles from the northern tip of Tinian. Fishers or boaters would be required

to shift by approximately 2 to 4 miles to avoid this area when the surface danger zone is activated, but potential impacts such as distances, travel times, and associated costs would vary depending on the typical routes and speeds used by a given vessel and the objective of the trip (e.g., recreational boating, transiting between islands, or fishing in a target location within the surface danger zones). A fisher or boater traveling from Saipan's Sugar Dock to the Port of Tinian's boat ramp may typically take approximately 1 hour to travel around 17 nautical miles at a speed of 15 knots when traveling close to the western coast of Tinian. When the largest surface danger zone is active, this trip could involve an additional distance of 10 miles and approximately 40 minutes to travel around the boundary of the surface danger zone, instead of straight through the area, to reach the same location at the same speed. However, when the smallest surface danger zone is activated, the travel distance and time remains fairly similar to existing conditions, requiring only 1 to 2 additional miles and a minimal difference in travel time. While Range Control would activate the smallest surface danger zone most frequently (refer to Section 4.1.3.1 Public Access) and the restrictions would only occur while live-fire training is occurring, the effects of the additional travel time or costs may be potentially significant to fishers and boaters.

Under Alternative 1 the military would not train in areas currently fenced and occupied by cattle. However, noise produced by aircraft approaching Landing Zones and detonations at the Explosives Training Range would occur intermittently during the year and would be audible in the areas where cattle have been known to graze (refer to Section 4.8.1 Approach to Analysis for a description of the noise modeling and metrics used for the impact analysis). Of these activities, explosives use at the Explosives Training Range is anticipated to produce the highest noise levels, generating single event peak sound levels of between 115 and 130 decibels that extend over areas where cattle may be present (refer to Section 4.8 Noise and Appendix J, *Noise Study*). Use of explosives would typically occur during large or medium training events and include approximately 20 charges of 1.25 pounds net explosive weight. When using the largest charge training would involve only one detonation per event, and this would occur 2 to 4 times per year.

As described in Appendix J, *Noise Study*, Attachment 1 (refer to Section 1.3.12.1 Domestic Animals), many studies have concluded that there is no evidence that aircraft overflights affect feed intake, growth, or production rates in domestic animals, and that cattle are able to adjust their behavior to changes in ambient noise levels. Noises above 90 decibels may cause a startle response, freezing (i.e., becoming temporarily stationary), and fleeing from the sound source. However, exposures to sound levels above 90 decibels from impulsive noise would be brief, lasting only for a fraction of a second per charge.

Training in the Military Lease Area where ranching most often occurs would not change the amount of land currently available to ranchers. The USMC would provide access to water for active ranchers to provide water for ranching needs at tank dispensing sites. Allowing additional access to water in these locations would provide a benefit, and may minimize the distance some ranchers may need to travel to obtain water, which would present a modest savings in time and money.

Other impacts from the proposed training may occur beyond access restrictions to the Military Lease Area, such intermittent and temporary disturbance to subsistence activities. Noise from training events may cause hunted species to temporarily relocate but they would return once the noise has ceased (refer to potential impacts to Terrestrial Wildlife in Section 4.4.3.2 Biological

Resources). This would be most likely to occur during medium or large events, which would occur less frequently throughout the year than small training events. As a result, the subsistence resources may be temporarily less available or more difficult to locate.

In summary, the size of a training event would largely dictate the amount, duration, and locations where public access may be restricted in the Military Lease Area under Alternative 1. Larger training events, which would occur only 2 to 4 times per year for 2 to 4 weeks at a time, would result in more access restrictions than medium or small events. Range Control would provide advanced notification of access restrictions related to training to the public and schedule training so that certain areas of the Military Lease Area can remain safely open for tourism, commercial ranching and agriculture, fishing, and subsistence activities while training is occurring. Safety and informational signage would also be posted in San Jose. In addition to communication efforts, the USMC would work with the Marianas Visitors Authority to promote travel opportunities to CNMI for service members living in Guam and Japan. Temporary activation of surface danger zones north of Tinian could significantly affect fishing and boating. However, this initial determination relies on limited data, primarily information gathered through personal communications. The USMC is therefore requesting public input to help refine this assessment. The Final EIS would reflect any revisions based on this input. All other socioeconomic impacts from Alternative 1 are anticipated to be less than significant.

Impacts on Other Economic Activities on Tinian

New employment opportunities and the acquisition of supplies required to operate and maintain the Military Lease Area Range Complex would provide a modest benefit to Tinian's economy. Spending would likely include payments to the Commonwealth Utilities Corporation for electrical and communications infrastructure, the purchase of fuel from local distributors for non-tactical vehicles, and local purchase of goods and supplies for vegetative control and other facilities maintenance-type activities, where permissible under federal government contracting requirements. In addition, as service members and supporting personnel are arriving to or departing from the CNMI during training events, they would have the opportunity to recreate in San Jose and spend money in town at shops and restaurants. This spending would have an indirect beneficial impact generated by training throughout the year, although it would, in turn, likely provide a benefit to the economy of Tinian and the supply chains throughout the CNMI.

In addition, there could be impacts to the availability of air transportation to the island and hotel rooms on Tinian during larger training events. During training, participating service members would arrive on the island by miliary transport and would camp within the Base Camp or in training areas for the duration of the event. However, there may be a limited number of personnel who arrive on-island to support certain training events (i.e., federal civilian employees, rotating Range Control personnel from Marine Corps Base Camp Blaz). These personnel may take commercial air taxi flights, which would increase the demand on the number of flights that travel to Tinian on those days they arrive and depart. These personnel would stay in local hotel accommodations during their visit, which would reduce the number of hotel rooms available to tourists when this occurs. However, training events would not be scheduled during the previously identified important local events to avoid undue pressure on hotel and car rental services. Thus, rental of local hotel rooms and vehicles would result in a beneficial impact to economic activity.

To minimize impacts to economic activities from training events, Range Control would provide notification to the public in advance of access restrictions related to training, and schedule training so that areas of the Military Lease Area can remain safely open to the public while training is occurring. Range Control would coordinate with the CNMI and Municipality of Tinian to ensure transparent scheduling of training events and ongoing communication with the public about temporary access restrictions. The USMC would utilize adaptive management to review how well the Range Control process is working, including the effectiveness of public notification methods, and would make adjustments as needed. Therefore, there would be a less than significant impact to economic activities as a result of training under Alternative 1.

Public Services

The USMC would coordinate with the CNMI and Municipality of Tinian regarding fire, police, and emergency response services. Coordination could include mutual aid agreements or memoranda. Mutual aid agreements could also help coordinate increased security for both the military and Tinian residents. Once utilities are installed, water trucks and hydrants would be located at the Base Camp (and, when necessary, pre-staged in the Military Lease Area) and at the live-fire ranges to supply water to extinguish fires. The existing rainwater catchment system at the USAGM Tinian site would continue to be utilized for fire protection. In addition, a Range Wildland Fire Management Plan would be developed. The plan would incorporate fire access roads and a firebreaks around the edges of the ranges as wildfire management measures. Prior to any live-fire training taking place during the dry season an assessment of moisture content would occur, in accordance with the requirements to be established in the Wildland Fire Management Plan. Live-fire activities would only be conducted after the fire danger rating has been confirmed by Range Control.

Military personnel training on Tinian should have little to no impact on the capacity of Tinian public health services because training units would provide medical and first aid capabilities via medics for each training event, with serious medical emergencies evacuated off island for care. The training unit would coordinate response and communications as part of training event planning. The USMC would contact U.S. Coast Guard Forces Micronesia/Sector Guam joint rescue sub-center or the CNMI Emergency Operations Center in the event of an emergency.

There would be at most 30 to 50 new permanent staff required to support Range Control. As described previously, hiring would be phased over the 10 to 15-year period as construction projects are completed and initially approximately 2-5 positions may be filled on a rotating basis by Marine Corps Base Camp Blaz Range Control staff or other federal civilians. The USMC intends to hire locally to fill Range Control positions, wherever possible, based on labor availability and contracting requirements. With the phased increase in population, availability of medics that would be on-island to accompany each training unit, and evacuation plans for serious medical events, there would be less than significant impacts public health services under Alternative 1.

4.3.3.2 Construction

Population and Demographic Changes

Under Alternative 1, the reuse and modification of equipment and facilities at the USAGM site on Saipan would not require new construction or vegetation clearing and there would be less than significant impacts from construction at that location. On Tinian, construction of training ranges

and support facilities would require an average of 50 workers per year beginning in 2026 and lasting for 10 to 15 years in phases. With this schedule, construction related to Alternative 1 would likely begin as the construction for the U.S. Air Force Divert Project is scheduled to conclude. Wherever possible, the USMC would prefer to hire locally for these temporary construction positions on the island. As a result, it is estimated that 20-30 percent of construction employees would likely be Tinian residents, which is similar to the numbers seen with the U.S. Air Force Divert project. Construction contractors would be expected to utilize local worker to the maximum extent practicable; use of non-immigrant foreign labor is generally not authorized unless efforts to recruit locally and in the U.S. are unsuccessful. However, because Tinian is anticipated to continue having a limited construction workforce into the future, and because it is very difficult to attract workers from the U.S. mainland to the CNMI, it is likely that most of the remaining construction workforce would be foreign workers on nonimmigrant H-2B visas as long as statutory authority for such use remains available. The current authority for H-2B construction workers in the CNMI expires at the end of 2029. As mentioned above, the U.S. Air Force Divert Project is scheduled to be complete by 2026 and Alternative 1 would be implemented in a phased approach. So, there is a possibility that construction workers could transition to work on Alternative 1 construction after the U.S. Air Force Divert Project is complete.

As mentioned above, the closure of the USAGM site has likely increased the available local workforce by approximately 28 people on Tinian. Additionally, utilization of the former USAGM site for the Base Camp would create minimal construction impacts since it is already developed, has facilities and infrastructure that could be reused and modified versus requiring new construction, and would require no additional clearing of vegetation, which may limit the number of construction staff that would need to be hired from off-island to construct those project elements. Vegetation maintenance and other restoration projects at North Field by the U.S. Air Force Agile Combat Employment Program is also anticipated to be ongoing through at least 2025, but this program has relied on service member labor to complete the majority of the work in its initial phases and that would be anticipated to continue.

Ideally all construction workers would be local to the CNMI. However, based on the recent U.S. Air Force's Divert project, a portion of the workforce would likely be migrant workers that would temporarily reside on Tinian when construction projects occur. Due to the intermittent and phased nature of construction under Alternative 1, up to 40 construction workers would reside in local hotels or longer-term rental lodging, such as the four dormitory-style accommodations (known as the "Triple J Dormitories") that have been used by the U.S. Air Force Divert project's construction personnel, instead of renting residential properties and relocating family members to the island during construction periods. The Triple J Dormitories can accommodate approximately 40 people (or around 10 people per dormitory building) with shared amenities, such as bathroom and laundry facilities, recreation, and food preparation areas (CNMI Bureau of Environmental and Coastal Quality 2023; Black Micro Corporation, Personal Communication, 2023). If this workforce-type rental housing is utilized, then the approximately 40 off-island workers needed for construction under Alternative 1 would result in less than significant impacts to housing availability on Tinian.

With regard to the migrant workforce, it is anticipated that most of their income would be remitted outside the CNMI, and would likely have limited activity in the local economy for food and daily support requirements. They would also have opportunities to spend time and money in town at

shops and restaurants. As a result, the influx or continuation of available construction jobs and slight increase in activity on Tinian would provide a modest economic benefit to the CNMI.

Economic Activities

While construction is underway, the demand for flights and port traffic from Saipan would increase temporarily to accommodate additional workers and construction equipment and supplies. The movement of goods through the Port of Tinian and TNI would create an economic benefit for Tinian during the construction period. Additionally, as described above, assuming the off-island construction workers are able to reside in the dormitory buildings instead of other local hotel accommodations typically used by tourists or other short-term visitors to Tinian, there would be a less than significant impact to the availability of hotel rooms on the island during the construction period.

Construction would result in an increase in noise, equipment and materials that may be visible to tourists or members of the public, and increases in vehicles transporting construction workers from their lodging to work sites on roads outside of and within the Military Lease Area. Both these impacts would be temporary and would be concentrated within specific areas of the Military Lease Area based on the project (refer to Section 2.1.11 Construction Phasing). To address the increase in construction vehicles on deteriorating local roads, DoD would work to improve road conditions for key routes within the Military Lease Area. This effort would also subsequently improve travel conditions to and from tourism and commercial ranching sites. Construction workers may also increase the number of visitors to popular tourism sites and beaches over this same time period during off-work times. Over the 10 to 15-year construction period there would be temporary and localized impacts in specific locations throughout the Military Lease Area where construction projects would occur (i.e., the Multi-Purpose Maneuver Range and surface Radar Towers, Explosives Training Range, utilities interconnections outside the Base Camp).

For safety during construction, local residents and visitors may be restricted from accessing the immediate area where construction is occurring or may choose to avoid areas where construction activities may be heard or seen. Noise and visual disturbance from construction activities may be present near agricultural areas or areas where subsistence activities occur. However, these effects would be localized and would last only until the construction project is complete. Impacts to cattle would be similar to those described for training. Namely, cattle and wildlife would be anticipated to adjust behavior to these temporary changes in their environment and return to the areas when construction is complete. As construction is anticipated to be limited to land-based work, there would be no impacts areas where commercial fishing or proposed aquaculture would occur. Therefore, there would be a less than significant impact to economic activities from construction under Alternative 1.

Public Services

As described for training under Alternative 1, the USMC would coordinate with the CNMI and Municipality of Tinian regarding fire, police, and emergency response services. If this coordination results in mutual aid agreements between the military and local community that are established to support training, there may be a modest increase in availability of emergency services on Tinian. While the construction workforce would rely on Tinian fire, police, and emergency services, the construction contractor would be required to have safety and emergency plans per guidelines set

forth by the U.S. Occupational Safety and Health Administration (e.g., project-specific Health and Safety Plan and Accident Prevention Plan). These plans would specify where the contractor would take their staff if an injury occurred that could not be treated on Tinian. As the construction contractor would be required to plan for and potentially augment services with staff hired to support construction, impacts to public services are anticipated to be less than significant.

While new or continued construction worker populations on the island would slightly decrease Tinian's police response staff to population ratio (12 officers per 1,000 residents), the ratio on Tinian far exceeds the average in the U.S. (2 per 1,000 residents). The amount of construction workers would vary over the 10-year construction period, and the phasing of the construction projects would help lessen potential strain on emergency staff capacity. The relatively small number of construction workers that would be needed on island at one time would not exceed the capacity of available public services and would result in less than significant impacts to public services.

4.3.4 Alternative 2

Under Alternative 2, training would continue and increase over the No Action Alternative by 5 percent. Socioeconomic impacts under Alternative 2 would be similar to those described under Alternative 1. As described above, impacts to population and demographics and public services are not influenced by training tempo and thus would be the same as described for Alternative 1. Impacts to economic activity under Alternative 2 would be similar to Alternative 1, primarily resulting from temporary restrictions to public access within the Military Lease Area. However, throughout the year, public access would remain unrestricted in the Military Lease Area where it could safely occur concurrent with the type of training scheduled, as determined by Range Control. The impacts consider the number of training areas involved, the duration of time restrictions would be in place, and whether live-fire training is occurring that would affect access to the in-water area north of Tinian. The same measures would be in place as described under Alternative 1 to minimize these impacts on economic activity, and there would be a modest economic benefit to the CNMI from additional jobs resulting from both training and construction. Therefore, there would be less than significant impacts to socioeconomics under Alternative 2.

4.4 Biological Resources

4.4.1 Approach to Analysis

The focus of this biological resource analysis is on the impacts that proposed training events and construction may have on terrestrial and marine resources. Terrestrial resources includes terrestrial vegetation, wildlife, and special status species, and marine resources includes marine communities and marine special status species. Factors used to assess potential impacts to biological resources include: (1) the type of resource (i.e., legal, commercial, recreational, ecological, or scientific); (2) the proportion of the resource that would be affected relative to its occurrence in the region; (3) the sensitivity of the resource to proposed activities; and (4) the duration or ecological ramifications of the impact(s).

Impacts to biological resources would be significant if there would be: fragmentation or permanent loss of a terrestrial or marine community to a level that would alter the overall biological function of the community in the region; if there would be physical loss of or exclusion of a species from required habitat, a significant decrease in productivity of native wildlife populations, or a

significant decrease in population size or distribution of regionally important native wildlife species; or if the Proposed Action were to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of habitat critical to the survival of the species.

The native species and habitats of Tinian are susceptible to the impacts of non-native, invasive species due to the island ecosystem and relatively small area of the island. Although certain highly invasive species such as the brown tree snake, coconut rhinoceros beetle, and little fire ant (*Wasmannia auropunctata*) have not been recorded on Tinian, these species have affected other islands in the region, such as Guam, and preventing the introduction of such species on Tinian is a high priority. As a result, the Proposed Action includes the construction of biosecurity facilities and implementing protocols to minimize the potential introduction of such invasive species, as described in Section 2.1.9.2 and further detailed in Appendix D.

4.4.2 No Action Alternative

Under the No Action Alternative, there would be no change to ground and aviation training. All existing best management practices and natural resources mitigations agreed to in previous consultations, including identified off-limits and limited training areas, forest enhancements, and Integrated Natural Resources Management Plan projects would continue. Because no change would occur under the No Action Alternative there would be no change to biological resources.

4.4.3 Alternative 1

4.4.3.1 Terrestrial Plant Communities

Under Alternative 1, plant communities could be impacted directly by proposed construction, vegetation maintenance and training events, and indirectly through the potential increase in the spread of invasive plant species over time or increased risk of potential fire, both of which can lead to changes in habitat composition. The plant communities directly impacted are presented in Table 4.4-1, and locations of impacts are shown on Figure 4.4-1, Figure 4.4-2, and Figure 4.4-3.

Under Alternative 1, up to 343 acres of vegetation would be removed, and those surfaces would then be maintained (mowed/trimmed). Of the impacted vegetation, over 81 percent is attributed to two types of plan communities. The two types of plant communities that would be most impacted are Leucaena forest and secondary limestone forest. Direct loss of up to 229.7 acres of Leucaena forest would represent an approximate 2.8 percent decrease in the total 8,283 acres of Leucaena forest on Tinian. Direct loss of up to 50.9 acres of secondary limestone forest would represent an approximate 0.8 percent decrease in the 6,207 acres of secondary limestone forest currently on Tinian. Alternative 1 would not impact the three most sensitive and ecologically valuable terrestrial plant communities on Tinian: limestone coastal scrub, limestone native forest, and wetland.

Under the Proposed Action, Landing Zones 2 and 6 and a new access road to Landing Zone 6, would be within the Natural Resources Conservation Area (part of the wildlife conservation area set aside in 1999 for Tinian Monarch conservation). Approximately 19 acres (2 percent of the Natural Resources Conservation Area) would be cleared for construction of the Landing Zones and access road. As part of developing the Landing Zones and road within the conservation area, the USMC is consulting with the U.S. Fish and Wildlife Service and would conduct appropriate measures in the DoD Conservation Area to mitigate for the approximately 19 acres of vegetation clearing in the Natural Resources Conservation Area. In addition, there are approximately 45.1

acres of secondary limestone forest (in the Military Lease Area, but outside of the Natural Resources Conservation Area) that would be directly impacted during construction, for which the USMC plans to conduct appropriate mitigation measures in the Pina Plateau region of Tinian.

As discussed in Section 2.1.9.2 Biosecurity Facilities and outlined in Appendix D, Joint Services would continue to comply with all existing biosecurity protocols applicable to the Proposed Action to reduce the spread of non-native vegetation species. Construction and training related activities by DoD Commands are ongoing on Tinian. Biosecurity protocols and facilities are currently being implemented and constructed to support DoD activities. The USMC is committed to complying with existing biosecurity protocols and expanding biosecurity facilities on Tinian to prevent the introduction and reduce the spread of invasive species, with emphasis on the brown tree snake. The USMC would coordinate with CNMI and federal agencies on pre-planning actions associated with biosecurity and would ensure adequate interdiction and early detection/rapid response resources and capabilities are available to support construction and training actions. In addition, the USMC proposes to construct a wash rack and brown tree snake barrier at Tinian Port to support interdiction of invasive species.

The risk of wildfire would increase with the occurrence of training events related to the use of live-fire ranges, aircraft, and ground vehicles. Such potential would be reduced through vegetation removal during construction and continued vegetation management within the Military Lease Area at live-fire ranges, Landing Zones, and roadways. Under Alternative 1, and as part of the USMC's Conservation Program, a Wildland Fire Management Plan would be developed. The Wildland Fire Management Plan would identify a comprehensive approach to reduce the frequency of wildland fires and lay out specific guidance, procedures, and protocols for the prevention and suppression of wildland fires and minimize wildland fire frequency, severity, and size. Notably, there are no records of wildfires on Tinian resulting from training events (NAVFAC Pacific 2014).

Figure 4.4-1 Plant Communities and Proposed Action Features (North)

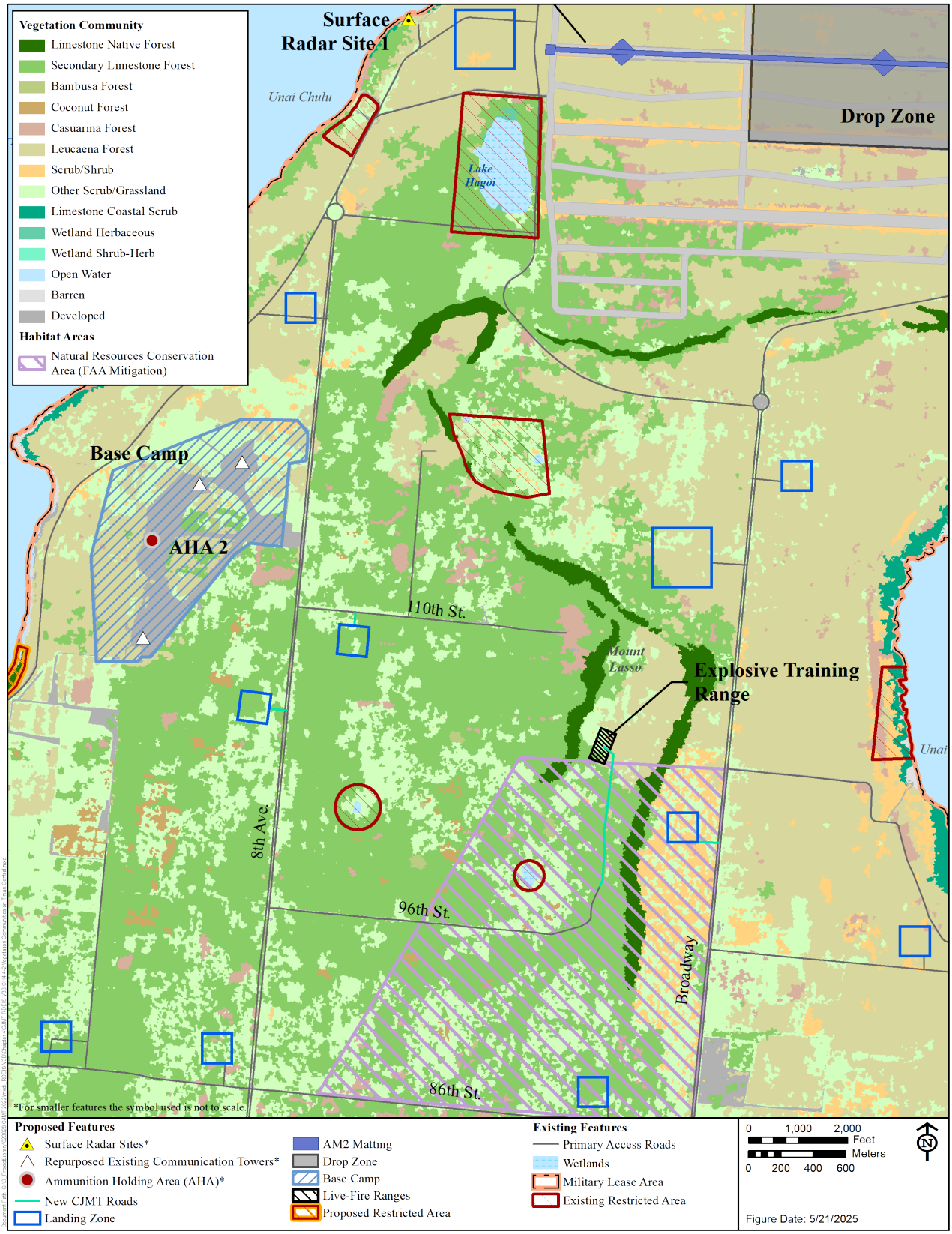

Figure 4.4-2 Plant Communities and Proposed Action Features (Central)

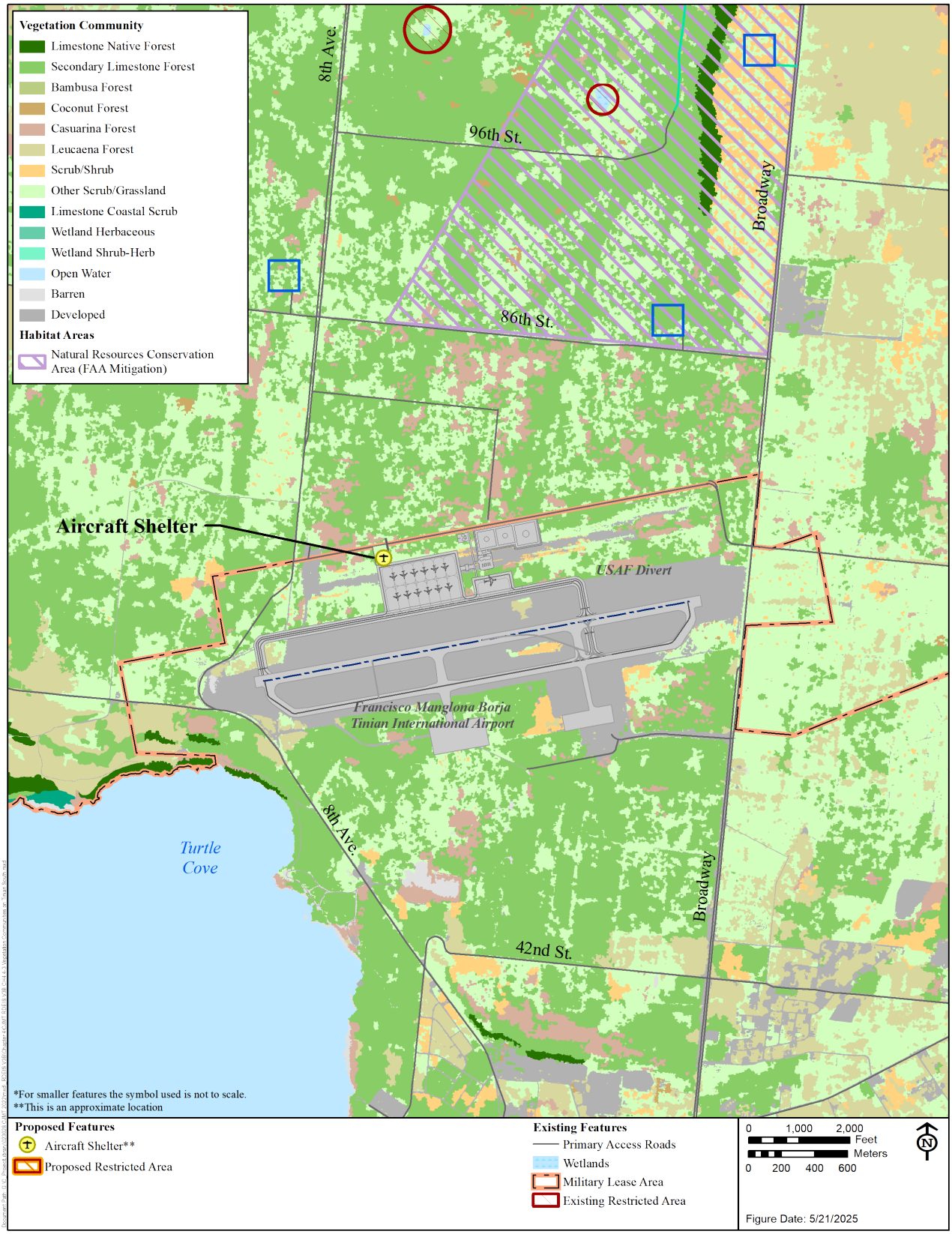

Figure 4.4-3 Plant Communities and Proposed Action Features (South)

Table 4.4-1 Plant Community Impacts under the Proposed Action

Plant Community	*Direct Impact Area (acres)*[1]										
	Landing Zones	*Multi-Purpose Maneuver Range (all components)*	*Utility Alignments*	*Base Camp Security Fencing*	*Explosives Training Range*	*Drop Zone*	*Surface Radar Towers*	*Potable Water Well Field*[2]		*New Roads*	*Total*
								Option A	*Option B*		
Casuarina Forest	0.7	0.02	1.0	0.1	-	2.2	0.1	0.5	0.2	-	**4.8**
Coconut Forest	-	-	0.02	-	-	-	-	-	-	-	**0.02**
Leucaena Forest	94.0	37.8	8.8	2.1	1.5	81.7	0.4	3.1	-	0.3	**229.7**
Secondary Limestone Forest	32.3	2.5	8.1	0.3	0.8	-	0.2	0.4	4.8	1.5	**50.9**
Other Scrub/ Grassland	23.8	1.2	10.5	1.5	2.5	0.02	-	3.2	2.7	0.4	**45.8**
Scrub/Shrub	6.3	-	0.1	0.1	-	4.4	-	0.8	0.02	0.1	**11.8**
Total	**157.1**	**41.5**	**28.5**	**4.1**	**4.8**	**88.3**	**0.7**	**8.0**	**7.7**	**2.3**	**343.0**

Notes: [1] Impacts to "Developed" habitat and areas that have been previously cleared of vegetation are not included in this table, as no vegetation impacts would occur in those areas.

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Construction and training activities may impact individual plants with cultural importance (refer to Section 3.4.1), as is described above for plant communities across Tinian. However, these species are common to Tinian and occur throughout the Military Lease Area. They would not be widely removed or destroyed, nor be subjected to long-term access restrictions. Impacts to any natural resources with cultural importance due to access restrictions during training would be intermittent, temporary, and mitigated by Range Control scheduling accommodation.

Considering the small percentage of impacted vegetation compared to existing vegetation, the absence of any impact to the three most sensitive and ecologically valuable terrestrial plant communities, and the invasive species and wildfire protocols, impacts to vegetation under Alternative 1 would be less than significant.

4.4.3.2 Terrestrial Wildlife

Under Alternative 1, wildlife could potentially be impacted by habitat removal or modification, physical disturbance (due to construction, training, noise and radio frequency radiation), direct strike, noise (from construction, aircraft, live-fire, and vehicular activity), fire, and human presence or other anthropogenic disturbance associated with construction and training activities. Under Alternative 1, training events would continue and would increase over the No Action Alternative by approximately 15 percent.

Plant communities that provide the highest habitat quality for native wildlife on Tinian (limestone coastal scrub, limestone native forest, wetland vegetation) would actively be avoided and would not be removed. The majority of vegetation removal during construction activities would occur in areas that are dominated by invasive species (Leucaena forest and secondary limestone forest). Certain species, such as the non-protected native bird species on Tinian are known to occupy Leucaena forest and secondary limestone forest, and often occur in higher densities than they do in limestone native forest (Spaulding et al. 2022). Native reptile species on Tinian are most likely to inhabit native forest habitats but may also occur in non-native habitats that would be impacted during construction.

Although commonly occurring native wildlife species may occupy the non-native dominated habitats that would be impacted under Alternative 1, the loss of approximately 343 acres of predominantly non-native dominated vegetation would represent a total loss of 1.5 percent of the approximately 22,964 acres of vegetated habitat on Tinian. Because vegetation clearance would only occur in small amounts dispersed throughout the Military Lease Area, the loss of habitat would not result in habitat fragmentation that would hinder the connectivity of any population of species or the ability for species to continue using those areas for dispersal across the island.

The majority of training events would occur in areas that are dominated by non-native and invasive species (Leucaena forest and secondary limestone forest). Non-protected native birds and native reptiles may occur in non-native habitats and may be impacted from disturbance to these habitats during training events. However, these plant communities are not optimal habitat for native wildlife species, and preferred wildlife habitats, such as limestone native forests and wetland habitats, would not be impacted by training. Therefore, impacts to native wildlife species due to training events would be minimal.

Terrestrial wildlife may be impacted by direct strike related to construction equipment, military vehicles, aircraft and stationary objects, but is determined to be less than significant based on the implementation of BMPs listed in Appendix D.

The proposed use of the mobile radar systems and surface radar towers would introduce the possibility of exposing bats and birds to radio frequency radiation, which is capable of heating organic tissues if exposed to radiation beams for long periods of time (the Occupational Safety and Health Administration metric of the upper limit of safe exposure [IEEE Std. C95.1] is 10 watts per square meter over 30 minutes). Potential effects to dangerous levels of radiation include disturbance, stress from overheating, or bodily injury. However, these surveillance systems produce radiation at extremely high frequencies (well above 116 megahertz) that are not likely to disturb wildlife. Also, the radar beam emissions are extremely narrow and thus very unlikely to intercept wildlife in flight. Should wildlife cross an active radar beam, exposure time would likely only be for fractions of a second due to the narrowness of the beam and because both the animal and the beam would be moving.

While the two proposed live-fire ranges would pose a minimal risk to wildlife (primarily bird species) from gunfire and explosives, the ranges would operate in a controlled and cleared area virtually eliminating the likelihood of directly impacting wildlife, as habitat for wildlife species would be removed on the ranges. As previously described for vegetation, prior to any live-fire training on the Multi-Purpose Maneuver Range and Explosives Training Range, an Integrated Wildland Fire Management Plan would be developed to reduce the frequency, intensity, and size of wildland fires and lay out specific guidance, procedures, and protocols in the prevention and suppression of wildland fires. The increases in flight operations and training on the two new live-fire ranges proposed under Alternative 1 would not result in significant population impacts to any non-listed wildlife species on Tinian.

Noise impacts from training events would primarily occur during active live-fire training, flight operations (including Landing Zone and drop zone use), and maneuver training (including increased human presence and foot traffic). The severity of these disturbances would be dependent not only on noise level but on frequency, regularity, and species sensitivity. Wildlife generally respond to noise from low-flying aircraft, although the ways in which they respond vary depending on life history, habitat, aircraft, and flight activities, and previous exposure to aircraft (Burger 1981). Physiological and/or behavioral responses can reduce an animal's fitness and ability to survive or increase its propensity to relocate. Low-altitude overflights can cause excessive stimulation, alertness, or stress. Tests on various terrestrial animals have shown that many species will undergo a "startle reaction" to noise in the range of 80 to 100 decibels or higher (Bowles 1995; UCSF 2024).

Under Alternative 1, aircraft overflights would continue to be restricted to altitudes of no less than 1,000 feet over high-quality habitats such as wetlands and limestone native forest, thereby reducing the likelihood of noise impacts on native species that inhabit these habitats. Almost all fixed wing overflights within the Military Lease Area would occur above 10,000 feet above ground level, producing peak sound levels between 56 and 82 decibels (refer to Section 4.8.1 Approach to Analysis for a description of the noise modeling and metrics used for the impact analysis). Some overflights as low as 2,000 feet above ground level may occur (particularly around North Field), but these would be unlikely to occur as part of regular activity. These events would produce peak sound levels up to 111 decibels directly below the flight path. Helicopters and tilt-rotor aircraft would fly between 300 and 2,000 feet above ground level and would be expected to produce peak sound levels between 73 and 91 decibels. Therefore, aircraft activity would likely induce startle

responses and other behavioral changes in wildlife; but such impacts would be brief, intermittent, and only occur in or over lower quality habitat.

Training events involving the use of explosives would generate single event peak sound levels of between 115 and 130 decibels that extend over an area of the ocean surface (refer to Section 4.8 Noise, Figure 4.8-2 through Figure 4.8-4, and Appendix J, Noise Study, Section J.3.3). Use of explosives would typically occur during large or medium training events and include approximately 20 charges of 1.25 pounds net explosive weight (Figure 4.8-2 and Figure 4.8-4). When using the largest charge (Figure 4.8-3) training would involve only one detonation per event (during daytime), and this would occur 2 to 4 times per year. Exposure to this impulsive noise would be brief, lasting only for a fraction of a second per charge. Wildlife in the vicinity, such as birds, may startle and move away from the noise into nearby adjacent habitat. In summary, impacts from aircraft overflights, training with explosives and live-fire in the Explosives Training Range and Multi-Purpose Maneuver Range would be brief, intermittent, and only occur in or over lower quality habitat, and would not induce behavioral shifts in wildlife populations; therefore, the increase in impacts on wildlife due to noise and human presence during training under Alternative 1 would be less than significant.

Noise and human presence during construction may cause wildlife to temporarily avoid areas in the immediate vicinity of construction activities. Nesting or breeding adults of various wildlife species can also be disturbed by noise and construction activities, including foot traffic, which may result in abandonment of young, increased susceptibility to depredation, and temporary displacement of wildlife from breeding habitat, resulting in reduced breeding success. Nesting bird surveys would be conducted prior to construction, and appropriate U.S. Fish and Wildlife Service-developed avoidance and minimization measures would be incorporated if nests were discovered. Due to the temporary and dispersed nature of these activities in combination with BMPs in place, noise and human presence from construction would not result in significant impacts to the population of any species on Tinian.

Non-native species may be inadvertently transported through the movement of cargo via aircraft and vessels to Tinian. The risk of introducing invasive species would increase with logistical transport associated with training events and construction on Tinian. Non-native species have potential to upset the fragile island ecosystem on Tinian because these species directly compete with native species for resources such as space, water, and food sources. Invasive species may also prey on, parasitize, or cause disease to native species. Training events and construction may increase the spread of invasive species. Biosecurity protocols (as discussed in Section 2.1.9.2 Biosecurity Facilities) and best management practices (Appendix D) would be implemented to avoid the potential spread or introduction of non-native species. The USMC would continue to comply with all existing biosecurity protocols applicable to the Proposed Action. Protocols for all administrative and other tactical and non-tactical movements are expected to include: (1) pre-departure biosecurity cleanliness inspections for plants/seeds, invertebrates (insects (including coconut rhinoceros beetles & little fire ants), spiders, snails, slugs, etc.), small vertebrates (frogs, lizards, rodents, shrews, etc.), and accumulated soil for all cargo transported to Tinian from Guam; (2) pre-departure and arrival brown tree snake canine inspections for all cargo, aircraft, and small vessels (≤100ft) departing Guam and arriving in Tinian; and (3) bio-sanitation standard operating procedures per the Armed Forces Pest Management Board Technical Guide No. 31 stands for military and construction cargo and materials prior to arrival and departure.

Alternative 1 incorporates best management practices, standard operating procedures, and other measures to avoid or minimize impacts to wildlife. These measures are discussed in detail in Appendix D, and include, but are not limited to, erosion control measures that would minimize ground disturbance and reduce erosion from training events and construction, a Stormwater Management Plan and Pollution Prevention Plan that would minimize impacts to water sources, pest control and biosecurity measures that aim to limit introduction of non-native species, and noise abatement measures that would reduce noise from construction. Therefore, impacts to wildlife under Alternative 1 would be less than significant.

4.4.3.3 Terrestrial Special Status Species

Known occurrences of federally listed and CNMI-listed species in the Proposed Action footprint are shown on Figure 4.4-4. Potential stressors to wildlife associated with the Proposed Action under Alternative 1 as described above also apply to the special status species analyzed in this section and are discussed as appropriate below. Preliminary effects determinations for federally listed species are presented in Table 4.4-2. Consultation with the U.S. Fish and Wildlife Service is ongoing under section 7 of the Endangered Species Act and the effects determinations from the Biological Opinion will be included in the Final Revised EIS. As introduction of invasive species would pose a threat to all species on Tinian, including special status species, biosecurity protocols (as discussed in Section 2.1.9.2 Biosecurity Facilities) and best management practices (Appendix D) would be implemented to avoid the potential spread or introduction of non-native species. As discussed in the preceding *Terrestrial Wildlife* section, these protocols and practices would reduce the likelihood of introduction and spread of non-native, invasive species.

Federally Listed and CNMI-listed Species

Mariana Common Moorhen. Mariana common moorhens are present throughout the year at Lake Hagoi and at the seasonal Bateha and Mahalang ephemeral wetlands when water is present. No training events or construction would occur at these wetland locations and no moorhens have previously been observed in the areas proposed for training events. As a result, construction activities would have no effect on the Mariana common moorhen. Potential effects from training noise affecting moorhens on the aforementioned wetlands are analyzed here. Noise levels from munitions training and aircraft operations were modeled for Lake Hagoi, the Mahalang wetlands complex, and the Bateha wetlands to assess potential effects to Mariana common moorhens. The results of the noise modeling are presented in Table 4.4-3. Refer to Section 4.8 for descriptions of noise measurements.

Figure 4.4-4 Occurrences of Federally Listed Species and Proposed Restricted Areas on Tinian

Table 4.4-2 Summary of Effects Determinations for Federally Listed Species on Tinian

Species	*Potential Stressors*	*Effects Determination*[1]
Mariana Common Moorhen	Noise	Likely to Adversely Affect
Micronesian Megapode	None	No Effect
Mariana Fruit Bat	Habitat Loss, Noise, Human Presence	Likely to Adversely Affect
Green Turtle	Noise and Human Presence	Likely to Adversely Affect
Hawksbill Turtle	None	No Effect
Humped Tree Snail	None	No Effect
Heritiera longipetiolata	Human Presence (low likelihood of foot traffic)	Not Likely to Adversely Affect
Dendrobium guamense	Human Presence (low likelihood of foot traffic)	Not Likely to Adversely Affect

Note: [1]Endangered Species Act section 7 determinations are pending. The Final Revised EIS will be updated with the effects determinations once the consultation is complete.

Table 4.4-3 Sound Exposure Levels at Mariana Common Moorhen Wetlands Under Alternative 1

Location	*Small Arms*		*Explosive Detonations*		*Aircraft Activity*[1]		
	CDNL (dB)	*PK15(met) (dBP)*	*CDNL (dB)*	*PK15(met) (2 to 4 events per year) (dBP)*	*DNL (dB)*	*Change from No Action Baseline DNL (dB)*	*L_{max} (dB)*
Lake Hagoi	48	108	<35	106	69	+25	102
Mahalang Complex	45	104	52	115	59	+18	95
Bateha 1	46	98	65	148	49	+2	99
Bateha 2	41	99	43	138	49	+3	99

Legend: CDNL = C-weighted Day-Night Average Noise Level; dB = decibels; dBP = peak unweighted decibels; DNL = Day-Night Average Noise Level; L_{max} = maximum sound level; PK15(met) = peak noise level expected to be exceeded by 15 percent of all events when adjusting for statistical variation due to weather.

Notes: Refer to Appendix J, *Noise Study*, for additional information about noise metrics and modeling.

[1] Includes cumulative noise level for an average year of training on Tinian, including landings and takeoffs at North Field, Landing Zones, low-level flights, and transport of materials, personnel, and equipment to support training through TNI.

Sound levels from live-fire training on Tinian may cause periodic startle responses or flushing of moorhens at Lake Hagoi, the Mahalang Complex wetlands, and the Bateha wetlands. At these locations, moorhens could exhibit short-term behavioral and/or physiological responses from exposure to noise during training activities under the Proposed Action, especially from explosives detonation which could reach up to 148 decibels (only 2 to 4 times per year) (Table 4.4-3). However, the wetlands where moorhens are known to occur at on Tinian are surrounded by thick, forested habitat that would generally provide a buffer to any live-fire or explosives noise in those habitats. Aircraft overflights would be restricted to altitudes of no less than 1,000 feet over wetland habitats, so these activities are less likely to impact individuals. However, the Day-Night Average Noise Levels at Lake Hagoi and the Mahalang Complex wetlands from aircraft activity would be

approximately 25 decibels and 18 decibels higher than baseline, respectively, under Alternative 1. Although average noise at wetland habitats would not reach levels that would mask moorhen calls, it would represent a noticeable change from the baseline conditions. Therefore, given that small arms and explosives may present blast noises that could temporarily alter moorhen behaviors and that average noise levels at wetland habitats would increase, the Proposed Action under Alternative 1 may adversely affect Mariana common moorhens. However, these events would be sporadic and short-term, and with the implementation of associated No Training Areas at wetlands where the species occurs, impacts to Mariana common moorhens would not be significant.

Micronesian Megapode. Historical observations of Micronesian megapodes in low numbers in the Mount Lasso area, south of Lake Hagoi, and a small area of forested habitat adjacent to Cross Island Road in the southern portion of the Tinian Military Retention Land for Wildlife Conservation (Figure 3.4-3) all occurred prior to 2014. Since then, megapodes have not been detected on Tinian (Joint Region Marianas 2023). No construction would occur in the vicinity of, or in any area where megapodes have historically been observed. Training events could occur adjacent to historical megapode locations. Given that the species has not been detected on the island since before 2014 and no resident breeding population of megapodes has ever been identified on Tinian (historical occurrences are all believed to be visiting individuals from neighboring islands), the Proposed Action under Alternative 1 would have no effect on the Micronesian megapode.

Mariana Fruit Bat. Ground training would not occur in the limestone native forest along the cliff line of Mount Lasso where the known fruit bat colony occurs, and training activities would generally occur in areas far removed from this location. Fruit bats typically roost during the day in colonies at sites to which they show a high level of fidelity (unless disturbed). In addition, a small proportion of fruit bats, usually males, roost alone or in small groups. While fruit bat colonies can be very easily disturbed by the sight, smell, or sound of humans (Mildenstein and Boland 2010), resting or foraging bats (not at a colony) have exhibited some tolerance for human disturbance and are approachable at relatively close distances. A 2012 study on Guam documented three encounters with Mariana fruit bats where the observers were able to get within 5 to 21 meters of roosting bats (two males, one male, and one female). During all three encounters, the Mariana fruit bats eventually departed their roost site but only after considerable time had passed (30 to 69 minutes) despite the presence of one or two observers (SWCA 2012b). During training events, individual bats could be exposed to noise and human disturbance. Although mostly active at night, fruit bats can be active during daylight hours and would potentially be exposed to noise and visual impacts from live-fire, use of blank ammunition, aircraft activity, and other training exercises. Mariana fruit bats do not echolocate, meaning they do not depend on a quiet soundscape to forage (Jones and Teeling 2006). However, fruit bats do rely on sound for vocalized communication with each other and excessive noise or any sort of stress from disturbance can lead to a variety of negative stress responses (Klose et al. 2006; Department of the Navy 2010). Hearing in *Pteropus* fruit bats is primarily used for communication or social activity and in detecting the approach of potential threats (e.g., predators) (Grinnell 1995). For those species of fruit bats that have been tested for hearing sensitivity, their audiograms are very similar to those of humans, with similar upper and lower frequency limits and hearing threshold levels (Calford et al. 1985; Koay et al. 1998; Heffner et al. 2006; Tarnovsky et al. 2023). A sound level of 0 decibels is approximately the lower threshold of human hearing and is barely audible under extremely quiet listening conditions.

Normal speech has a sound level of approximately 60 decibels; sound levels above 120 decibels begin to be felt inside the human ear as discomfort, and sound levels ranging from 130 to 140 decibels are toward the upper threshold and are felt as pain (Berglund and Lindvall 1995). Therefore, it can be assumed that fruit bat species have similar thresholds.

Responses to military aircraft noise by Mariana fruit bats have been studied on Guam and Rota (SWCA 2012a). Results of this research indicated that fruit bats flushed at aircraft noise levels exceeding 90 A-weighted decibels (mid-range frequencies) and 106 C-weighted decibels (low and high frequencies). Fruit bats at a maternity colony on Rota flushed when a helicopter flew within 200 meters of the colony and when a military jet flew within 300 meters. This study also found that following aircraft overflights, Mariana fruit bat active thermoregulation increased by 32 percent, maintenance behaviors increased by 14 percent, locomotion increased by 74 percent, and alertness increased by 62 percent (SWCA 2012a).

Under Alternative 1, all construction would occur during daylight hours. No construction activities would occur in any limestone native forest or on Mount Lasso, and any bat colony location occurring in the limestone native forest of that region would be far enough removed from construction activities, and sheltered by the forested habitat, so as not to be impacted by noise from construction in other areas of the island. For example, at 50 feet away, construction equipment can produce maximum sound levels between 70 and 95 decibels, but that dissipates to around 65 decibels at a distance of 300 feet and less than 65 decibels at 1,000 feet. Under Alternative 1, the nearest construction to the known fruit bat colony would be over 3,000 feet away. Mariana fruit bats are largely nocturnal (resting/roosting during the day and most active at night). Loss of up to 50.9 acres of secondary limestone forest under Alternative 1 would initially represent a loss of potential roosting and foraging locations for Mariana fruit bats on Tinian. However, as described in Section 4.4.3.1, the USMC would mitigate for impacts to secondary limestone forest through forest restoration/enhancement.

Based on known habitat use for this species, most noise generated as part of training events and construction to support training would be produced from much farther distances away from known observation points. Consistent with current measures to protect the Mariana fruit bat on Tinian, under the Proposed Action, any aircraft that must fly over limestone native forest during training exercises would fly at a minimum of 1,000 feet above ground level to minimize visual and noise disturbance to potentially occurring fruit bats. Although these disturbances would most likely be intermittent, infrequent, and temporary, fruit bats, especially those foraging or roosting away from the known colony, or traversing in areas adjacent to training activities may still be subjected to peak sound levels at or above 90 decibels, which may induce startle responses or other temporary behavioral shifts. Results of noise modeling completed for the Revised EIS that show sound exposure levels at the Mariana fruit bat colony location on Tinian are presented in Table 4.4-4. Refer to Section 4.8 for descriptions of noise measurements.

Table 4.4-4 Sound Exposure Levels at Mariana Fruit Bat Colony Location

Location	*Small Arms*		*Explosive Detonations*		*Aircraft Activity*[1]	
	CDNL (dB)	*PK15(met) (dBP)*	*CDNL (dB)*	*PK15(met) (2-4 events/year) (dBP)*	*DNL (Change from No Action Baseline) (dB)*	*L_{max} (dB)*
Bat Colony Location	45	104	<35	107	55 (+12)	104

Legend: CDNL = C-weighted Day-Night Average Noise Level; dB = decibels; dBP = peak unweighted decibels; DNL = Day-Night Average Noise Level; L_{max} = maximum sound level; PK15(met) = peak noise level expected to be exceeded by 15 percent of all events when adjusting for statistical variation due to weather.
Notes: Refer to Appendix J, *Noise Study*, for additional information about noise metrics and modeling.
[1] Includes cumulative noise level for an average year of training on Tinian, including landings and takeoffs at North Field, Landing Zones, low-level flights, and transport of materials, personnel, and equipment to support training through TNI.

As shown in Table 4.4-4 and detailed in the Noise Study (Appendix J), the loudest single event noise impacts from the Explosives Training Range would occur from large detonations (cratering charges of up to 40 pounds net explosive weight). Such detonations would occur infrequently, up to 4 times per year. In addition, during the planning process for the Proposed Action, the USMC re-sited the location of the Explosives Training Range from an area further north on Tinian and closer to the bat colony, to the current location presented in this Revised Draft EIS, which would decrease the noise impacts on the species. However, the 107 decibel noise contour generated by the detonations would overlap the northern portions of the Mount Lasso region, likely reaching the known Mariana fruit bat colony. Therefore, these events may induce behavioral and/or physiological shifts in Mariana fruit bats on Tinian, but the effects would be infrequent and dispersed throughout the year, very brief in duration (fractions of a second), and would not rise to the level of inducing pain.

As fruit bats are largely active at night and use vision for foraging, night lighting has the potential to impact fruit bats. Measures discussed in Appendix D would be implemented to reduce the impact of any night lighting on wildlife, including fruit bats.

While training events would be sporadic and short-term, noise from aviation and live-fire training would be likely to adversely affect the Mariana fruit bat. Noise from explosives training and intermittent disturbance from human presence (especially due to visual and noise disturbance from training activities) may induce startle responses or other temporary behavioral shifts. Therefore, impacts to Mariana fruit bats resulting from noise and human presence would potentially be significant.

Green Turtle. As discussed in Section 3.4.3.1, over 50 percent of recent green turtle nesting activity has occurred at Unai Dankulo, with other nesting activity occurring on scattered beaches across Tinian (Figure 3.4-3). Ground training events under Alternative 1 would occur on Unai Chulu, Unai Babui, Unai Lam Lam, Unai Masalok and Unai Dankulo, all of which are known nesting beaches for green turtles. Personnel accessing these beaches have the potential to disturb turtles that may be on the beach and pose a risk of directly harming eggs if turtles are actively nesting on these beaches. Per the Joint Region Marianas Integrated Natural Resources Management Plan, regular monitoring of sea turtle nesting would continue at all potential beach nesting sites where training may occur under Alternative 1. If an active nest has been discovered, night training will not occur after 50 days of incubation until the nest has hatched or a buffer (9 meters [30 feet] wide)

from the active nest to the water will be in place to avoid any potential impacts to sea turtle hatchlings trying to reach the ocean. Pre-event surveys for turtles would be conducted no more than six hours prior to training on any beaches that are suitable for turtle nesting. In addition, if a turtle is observed hauling out on a beach where training activities are occurring, the training activity would halt until the turtle has left the beach. These ongoing measures would largely eliminate potential disturbances to sea turtles.

Results of noise modeling completed for the Revised EIS that show sound exposure levels at green turtle nesting beaches in the Military Lease Area are presented in Table 4.4-5. Refer to Section 4.8 for descriptions of noise measurements.

Table 4.4-5 Sound Exposure Levels at Green Turtle Nesting Beaches in the Military Lease Area

Location	*Small Arms*		*Explosive Detonations*		*Aircraft Activity*[1]	
	CDNL (dB)	*PK15(met) (dBP)*	*CDNL (dB)*	*PK15(met) (2-4 events/year) (dBP)*	*DNL (Change from No Action Baseline) (dB)*	*L_{max} (dB)*
Unai Chulu	47	106	<35	104	75 (+32)	108
Unai Lam Lam	60	122	40	104	31 (+22)	99
Unai Chiget	49	109	36	123	64 (+24)	95
Unai Dankulo	43	102	40	137	50 (+3)	104
Unai Masalok	40	98	46	126	53 (+1)	99
Unai Babui	49	110	<35	104	76 (+36)	108

Legend: CDNL = C-weighted Day-Night Average Noise Level; dB = decibels; dBP = peak unweighted decibels; DNL = Day-Night Average Noise Level; L_{max} = maximum sound level; PK15(met) = peak noise level expected to be exceeded by 15 percent of all events when adjusting for statistical variation due to weather.

Notes: Refer to Appendix J, *Noise Study*, of the Revised EIS.

[1] Includes cumulative noise level for an average year of training on Tinian, including landings and take-offs at North Field, Landing Zones, low-level flights, and transport of materials, personnel, and equipment to support training through TNI.

Results of noise modeling completed for the Revised EIS indicate that small-caliber weapons training on Tinian would expose nesting green turtles to less than 50 decibels C-weighted day-night average sound level at Unai Chiget, Unai Chulu, Unai Dankulo, and Unai Masalok, and 60 decibels C-weighted day-night average sound level at Unai Lam Lam. Small-caliber weapons fire would generate between 98 and 122 decibels Peak (PK_{15}) at these same beaches. Noise generated by explosive detonations would potentially expose nesting green turtles to up to 46 decibels C-weighted day-night average sound level and a peak sound level 104 to 137 decibels (unweighted). All aircraft operations on Tinian could expose nesting green turtles to 95 to 108 decibels or 31 to 76 decibels day-night average sound level. See Appendix J for detailed noise metrics and modeling results.

Information regarding exact noise disturbance thresholds of turtles on land is limited (National Oceanic and Atmospheric Administration 2023). Morphological investigations have demonstrated that sea turtles have poor auditory receptors to airborne sound, with limited on land hearing for low frequencies (Bartol and Ketten 2006; Popper et al. 2014; Piniak et al. 2016). The National

Oceanic and Atmospheric Administration (2023) currently uses Root Mean Square 175 decibels as the underwater "Onset of Behavioral Disturbance Acoustic Threshold for Sea Turtles." No such threshold is known for land-based noise. As shown in Table 4.4-5, no sound levels would approach 175 decibels under the Proposed Action. Peak sound levels from explosive detonations and small arms may cause individual adult turtles to avoid beaches during periods of training. In addition, the Day-Night Average Sound Level from aircraft activity would significantly increase on beaches such as Unai Chulu, Unai Lam Lam, Unai Chiget, and Unai Babui. Although the behavioral shifts that green turtles may exhibit based on such increases in land-based noise are not well understood, it is expected that nesting and hauled out individuals would be exposed to increases in noise exposure that may alter behavior.

No construction would occur on any of the beaches on Tinian. The nearest construction to any sea turtle nesting beach would be over 1,000 feet away. Morphological investigations demonstrated that sea turtles have poor auditory receptors to airborne sound, with limited on-land hearing for low frequencies typically produced by ground construction (Bartol and Ketten 2006; Popper et al. 2014; Piniak et al. 2016). Therefore, airborne noise is not anticipated to disturb green turtles as potentially loud noise levels would attenuate by the time sound would reach a green turtle on the beach and hearing sensitivity is limited on land. Although night lighting in the vicinity of beaches has the potential to impact sea turtles, floodlights that may be temporarily used for training events would not be used on beaches and would utilize light shielding best management practices, as described in Appendix D, which would eliminate the potential to impact nesting or hauled out turtles.

Therefore, due to increases in land-based noise from explosive training, small arms, and aircraft activity, the Proposed Action may adversely affect individual green turtles. However, those effects would be brief and intermittent, and overall impacts to green turtles on Tinian would be less than significant.

Humped Tree Snail. Humped tree snails on Tinian are currently only known to occur at Lamanibot Bay. Under Alternative 1, no training events or construction would occur at Lamanibot Bay, and a restricted area would be established (Figure 4.4-4). Likewise, there would be no removal of potential limestone native forest tree snail habitat. Therefore, the Proposed Action under Alternative 1 would not impact the humped tree snail.

Heritiera longipetiolata. H. longipetiolata groves are well-documented on Tinian in limestone habitats near the coast (Figure 3.4-3). No construction would occur in areas where the species occurs. In addition, a restricted area would be established where the majority of *H. longipetiolata* occur (Figure 4.4-4). Although there is one known *H. longipetiolata* grove that occurs outside of the proposed restricted area, which would make it susceptible to foot traffic during foot patrols and foot maneuver exercises, the grove occurs in such a difficult to access area of ragged, karst limestone coastal scrub, it is unlikely that troop foot traffic would ever occur there. In addition, there are no planned training activities in the vicinity of the *H. longipetiolata* grove that occurs outside of the proposed restricted area. Therefore, the Proposed Action may affect but is not likely to adversely affect *H. longipetiolata* and impacts to the species would be less than significant.

Dendrobium guamense. D. guamense individuals occur in limestone native forest habitat in the Mount Lasso region (Figure 3.4-3). No vegetation removal would occur on or around Mount Lasso and there would be no training activities involving live-fire or explosives on Mount Lasso.

However, foot patrols and foot maneuvers may occur in limestone forest habitat on Mount Lasso in and around where *D. guamense* individuals are known to occur. Although an epiphytic species, there is still potential for *D. guamense* to be trampled, crushed, or otherwise disturbed during foot patrols and foot maneuver exercises. However, the likelihood of individuals being trampled or crushed is very low given the dispersed occurrence of individuals, typically in difficult to access karst terrain, and their general occurrence above ground level on branches or downed logs. In addition, any troop training on Mount Lasso would occur in areas that are open to the public and already experience intermittent foot traffic disturbance. Therefore, the Proposed Action is not likely to adversely affect *D. guamense* and impacts to the species would be less than significant.

Migratory Birds

Impacts to migratory birds would be similar to those described for bird species in Section 4.4.3.2. Most migratory bird species that may occur on Tinian are shorebirds or pelagic species (e.g., black noddy, brown booby, brown noddy, gray-tailed tattler, Pacific reef heron, wandering tattler and white tern), that do not utilize the majority of inland habitats on Tinian. These birds would not be exposed to construction impacts and would generally be less exposed to training activity as Alternative 1 training occurs mainly inland and away from the shoreline. Training activities occurring on the beach may disturb foraging birds, but because these species are highly mobile, any effects would be temporary and minor.

The eight native species of Migratory Bird Treaty Act-protected land birds that occur on Tinian would experience nearly identical impacts as those described for native bird species in Section 4.4.3.2. In particular, the removal of up to 343 acres of vegetated habitat would result in the loss of nesting, foraging, and resting areas for these migratory bird species. This would represent a loss of 1.5 percent of the approximately 22,964 acres of vegetated habitat on Tinian. Training activity impacts to these three species would be as described in Section 4.4.3.2. All eight of these species are relatively common on Tinian, their populations have been increasing on Tinian since the 1980s, and they are able to utilize a variety of habitats on the island. Although Alternative 1 may disturb individuals of these species, such impacts would be minor and temporary, and as such would not affect the overall fitness of any population of these migratory species.

Although impacts to migratory birds are expected to be minimal, best management practices incorporated into the Proposed Action would further minimize impacts to migratory birds. Nesting bird surveys would be conducted prior to construction, and appropriate U.S. Fish and Wildlife Service-developed avoidance and minimization measures would be incorporated if Migratory Bird Treaty Act-protected bird nests were discovered. Other best management practices that would minimize impacts to migratory birds include pest control and biosecurity measures that aim to limit introduction of non-native species, and noise abatement measures that would reduce noise from construction.

In summary, while events would be sporadic and short-term, noise from aviation and live-fire training may significantly affect Mariana fruit bat. Aside from potential significant effects on the Mariana fruit bat, the Proposed Action under Alternative 1 is anticipated to result in less than significant impacts for all other federally listed species, CNMI-listed species, and migratory birds. This NEPA conclusion is supported by the location of training and construction areas, minimal habitat loss, the abundance of other species, and the implementation of best management practices and standard operating procedures designed to reduce potential impacts. Endangered Species Act

Section 7 determinations are pending as consultation with the U.S. Fish and Wildlife Service is occurring. The Final EIS will be updated with the effects determinations and any mitigation measures when the consultation is complete.

4.4.3.4 Marine Communities

Training

Under Alternative 1 all proposed training activities would be conducted entirely on land. However, portions of the designated surface danger zone associated with the Multi-Purpose Maneuver Range would extend over adjacent coastal waters. USMC ranges are intentionally designed to minimize the likelihood of projectiles leaving the primary target area. Data from operational assessments and range clearance programs consistently show that nearly all projectiles remain within the land-based portion of the target area. This high level of containment is the result of several safety and design measures: all weapons and ammunition used meet strict DoD standards for performance and accuracy; every operator is certified on their weapon; the firing positions and target locations are arranged to ensure rounds remain within the intended land area; and targets are constructed with materials that help reduce the chance of ricochets.

Other factors that would limit the probability of a projectile entering coastal waters would include the native vegetation surrounding the range which would act as a natural buffer, further slowing or stopping projectiles before they could reach coastal waters, and the undulating terrain of the range that would likely stop or slow down ricocheting projectiles. In the event of a ricochet, a projectile would rapidly lose speed due to air resistance, significantly reducing its potential to travel beyond the range boundary.

On rare occasions, a projectile from the Multi-Purpose Maneuver Range may travel outside the target area but still land within the surface danger zone. In the unlikely event that a projectile enters coastal waters, the risk to marine habitats would remain very low. Once a projectile enters the water, it would further lose energy and move quickly through the water column to settle on the sea floor. Marine mammal data confirm that marine mammal densities in the waters surrounding the CNMI are consistently low (DON 2013, 2018). Therefore, it is highly unlikely that projectiles entering coastal waters would result in impacts to marine species.

At the Explosives Training Range, all training activities would occur on land, and the associated surface danger zone is entirely land-based. All explosive materials would be consumed upon detonation and not be available in the environment for entrainment in surface runoff, providing additional protection to the marine environment. Since no in-water live-fire training occurs and indirect impacts such as minor debris would not measurably degrade habitat or water quality, impacts to marine communities would be considered less than significant.

Noise produced from live-fire training on the Multi-purpose Maneuver Range and Explosive Training Range would extend over coastal waters and the peak sound levels may extend into the waters surrounding Tinian (refer to Section 4.8.3.1 Noise). The analysis for noise impacts in this section focuses on potential impacts to sea turtles and marine mammals that may be present in the waters surrounding Tinian while explosives live-fire training occurs (refer to Section 4.4.3.3 for a discussion of potential impacts from training noise on sea turtles that may be nesting on beaches).

Because explosive detonations occur on land away from the coast, and the presence of vegetation further reduces noise transfer off the range, most of the sound energy reflects off the water's

surface, and only a small portion enters the water column. This limits the transmission of airborne sound into the marine environment. Research shows that sea turtles and marine mammals have limited sensitivity to airborne noise (Bartol and Ketten 2006; Popper et al. 2014; Piniak et al. 2016), and any sound that does enter the water would be significantly reduced by the time it reaches nearshore areas. Additionally, marine species would need to be both close to the shoreline and at the surface at the exact moment of detonation to experience any notable exposure. However, marine mammal and sea turtle densities in nearshore waters around Tinian are low. Under the proposed plan, smaller explosive training events would occur about 20 times per year, with each event using a set of small charges weighing 1.25 pounds each. Larger explosive events would happen less often, only two to four times per year, and could involve up to 40 pounds of explosives in a single event. Based on this combination of sound dispersion characteristics, biological sensitivity, low animal presence, and limited training frequency, the potential for adverse impacts to marine mammals or sea turtles from airborne noise is considered highly unlikely and less than significant.

Proposed aviation training would involve fixed-wing, rotary, tilt-rotor, and drone aircraft. Any in-water or at-sea effects from aviation operations extending from Tinian's highwater mark towards the sea, including overflights around Tinian's coastal waters, are analyzed in and covered under the *MITT EIS/OEISs* (DON 2010a, 2015a, 2020) and associated consultations and authorizations. Portions of aviation training operations occurring offshore from Tinian would follow applicable operational requirements and procedures specified in the environmental or permitting documents referenced above, within the Mariana Islands Range Complex, and are not further analyzed in this Revised Draft EIS.

Construction

There are no in-water construction activities proposed and no land-based construction activities that would directly impact the marine environment. Construction would occur more than 1,000 feet away from any surface or nearshore waters at elevations above sea level. Under Alternative 1, there would be the potential for short-term, indirect, negligible impacts to marine communities to occur from sedimentation, runoff, and potential spills during construction. Best management practices would be implemented to avoid and minimize risks to marine communities. These include erosion control measures during construction such as minimizing the ground disturbance area and adoption of a Stormwater Pollution Prevention Plan and a Hazardous Materials Management Plan that would prevent pollution in water sources and other habitats and fueling of any equipment occurring at least 50 feet away from the water and preferably on an impervious surface. New surfaces resulting from construction under Alternative 1 would be designed to minimize surface water runoff through implementation of low-impact development and BMPs for stormwater management systems. These measures would be developed in accordance with all applicable CNMI regulations for stormwater management and water quality, including applying the principles from the *CNMI and Guam Stormwater Management Manual* (Horsley Witten Group, Inc. 2006). Refer to Appendix D for a list of all best management practices that would be implemented during the Proposed Action.

4.4.3.5 Marine Special Status Species

Training and Construction

Marine special status species (refer to Table 3.4-5) include marine mammals, sea turtles, fishes, corals, and invertebrates that may be present in the nearshore waters around Tinian. Potential effects to species that primarily remain below the surface of the water, such as corals, invertebrates, and fishes including sharks and rays, would be the same as described above under Section 4.4.3.4. On rare occasions that a projectile may enter the coastal waters, the risk to marine species including individual fish, mammals, or turtles that may be present in the area remains very low. A projectile would travel only a few feet underwater before losing energy entirely and sinking to the bottom very quickly. This would make harm from strike or ingestion to marine life highly unlikely in the rare event that a projectile could enter the water during training activities. Noise from live-fire training would extend over coastal waters. Marine mammals or sea turtles in nearshore area surrounding Tinian during live-fire training would have to be coincidentally near to shore and at the surface during times of gunfire or at detonation to be affected.

Marine Protected Areas

The only Marine Protected Area identified for Tinian is located along the southeast coast of the island, which is well outside of the Military Lease Area and remote from any proposed military training. Therefore, the proposed training and construction activities would not harm the natural or cultural resources that are protected within this Marine Protected Area.

Essential Fish Habitat

Potential impacts to Essential Fish Habitat from both training and construction would be the same as described under Section 4.4.3.4 Marine Communities. Alternative 1 would incorporate best management practices, standard operating procedures, and other measures to avoid or minimize impacts to marine resources and its crucial components, such as Essential Fish Habitat. These measures include erosion control measures during construction such as minimizing the ground disturbance area and adoption of a Stormwater Pollution Prevention Plan and a Hazardous Materials Management Plan that would prevent pollution in water sources and other habitats and fueling of any equipment occurring at least 50 feet away from the water and preferably on an impervious surface. New surfaces resulting from construction under Alternative 1 would be designed to minimize surface water runoff through implementation of low-impact development and best management practices for stormwater management systems. These measures would be developed in accordance with all applicable CNMI regulations for stormwater management and water quality, including applying the principles from the *CNMI and Guam Stormwater Management Manual* (Horsley Witten Group, Inc. 2006). Refer to Appendix D for a list of all BMPs that would be implemented during the Proposed Action. The USMC is consulting with the National Marine Fisheries Services on potential impacts to essential fish habitat under the Magnuson-Stevens Fishery Conservation and Management Act. The Final EIS will be updated with the effects determinations when the consultation is complete.

4.4.4 Alternative 2

Under Alternative 2, impacts associated with construction would be very similar to those described under Alternative 1. Under Alternative 2, training would continue and would increase over the No Action Alternative by approximately 5 percent, compared to a 15 percent increase under

Alternative 1. The types of impacts to both terrestrial and marine biological resources from training events would remain the same under Alternative 2. However, the decreased training tempo would reduce the frequency of temporary impacts (e.g., noise and visual impacts associated with human, vehicular, and aircraft presence) to both terrestrial and marine biological resources, specifically wildlife species or marine special status species. Therefore, impacts to biological resources from Alternative 2 would be less than significant.

4.5 Cultural Resources

4.5.1 Approach to Analysis

This analysis considers the impacts of the Proposed Action to cultural resources. Cultural resources include historic properties that are eligible for the National Register of Historic Places and other cultural resources that are not eligible for the National Register of Historic Places but still hold traditional, religious, or cultural importance to the community, such as cemeteries, memorials, and places for growing and/or gathering medicinal plants as discussed in both the Socioeconomics and Biological Resources sections. NEPA incorporates the National Historic Preservation Act analysis of potential effects on historic properties as part of the evaluation of environmental consequences while also addressing environmental impacts to other categories of cultural resources.

NEPA and the National Historic Preservation Act are separate statutes that evaluate and address impacts differently. For example, the effects of an undertaking on a historic property can be adverse under the National Historic Preservation Act's Section 106 without triggering a determination of significant impacts for a Proposed Action under NEPA. Under Section 106, adverse effects to historic properties must be resolved through measures that avoid, minimize, or mitigate effects. Under NEPA, potential impacts can also be mitigated through avoiding, minimizing, or reducing impacts.

Impacts to cultural resources can occur both directly and indirectly, and result in the loss of character-defining features and/or aspects of integrity that convey a resource's significance. If the impact comes from the action at the same time and place with no intervening cause, it is considered direct regardless of its specific type (e.g., whether it is visual, physical, auditory). Indirect impacts are those caused by the action that are later in time or farther removed in distance but are still reasonably foreseeable. The assessment of impacts to cultural resources is based on the following considerations:

1) physically altering, damaging, or destroying all or part of a resource;
2) altering characteristics of the surrounding environment that contribute to a resource's significance;
3) introducing visual or audible elements that are out of character with the resource or that alter its setting;
4) neglecting the resource to the extent that it deteriorates or is destroyed; or
5) limiting access to resources and sacred sites where such access is currently available and important.

Additionally, Section 110(f) of the National Historic Preservation Act gives special consideration to National Historic Landmarks by requiring federal agencies, to the maximum extent possible, minimize harm to any National Historic Landmark that may be directly and adversely impacted by an action. The Tinian Landing Beaches, Ushi Point Field, and the Tinian Island National

Historic Landmark (hereafter called North Field National Historic Landmark) is within the area of potential effect. In accordance with Section 110(f), the USMC is, to the maximum extent possible, minimizing harm to the North Field National Historic Landmark from the Proposed Action.

Section 106 Consultation

Consistent with the National Historic Preservation Act, the USMC is conducting consultation on the Proposed Action with the CNMI Historic Preservation Officer, the National Park Service, the Municipality of Tinian, and the Advisory Council on Historic Preservation. To date, this consultation has included a number of correspondence and consultation meetings with the consulting parties to identify cultural resources, potential effects, and measures to avoid, minimize, and mitigate adverse effects to historic properties. Additionally, as part of this process, the USMC provided information and solicited input from the public to identify potentially affected cultural resources.

This consultation resulted in two documents that meet the USMC's Section 106 requirements. The first is an amendment to the 2022 Mariana Islands Testing and Training Programmatic Agreement that extends the coverage of ground training throughout the Military Lease Area and includes new live-fire training at the Multi-Purpose Maneuver Range and Explosives Training Range. The second is a programmatic agreement that covers the construction elements of the Proposed Action and includes alternate Section 106 procedures for those portions of the Proposed Action that could not be assessed for effects as well as those that may require modifications (Appendix H). Both programmatic agreements stipulate mitigations to avoid, minimize, or mitigate adverse effects. Minimization measures include limiting vehicle use to roadways, designating discrete training areas to allow for public access when compatible with training, and archaeological monitoring for ground disturbing activities. Additional minimization measures include cultural resources training for all personnel associated with training and construction activities, and painting of the surface radar towers and water tanks located south of the Multi-Purpose Maneuver Range to blend in with the surrounding landscape. Mitigation measures to resolve adverse effects include providing interpretive signage at the North Field atomic bomb loading pits and Mount Lasso, a virtual tour focusing on the North Field National Historic Landmark and its contributing resources, an interpretive pamphlet on Chamorro history and culture, and a plan to develop an interpretive center on Tinian to display recovered artifacts. While the preference is to avoid and preserve in place, data recovery and recordation methods would be implemented when adverse effects to character-defining features are unavoidable.

4.5.2 No Action Alternative

Under the No Action Alternative, ground and aviation training would continue on lands in the Military Lease Area at the same tempos as evaluated in previous NEPA documents (DON 2010a, 2015b) and associated consultations. In addition, construction associated with the U.S. Air Force Divert project (U.S. Air Force 2016, 2020) would continue until complete, which is estimated to be by 2026. As part of a separate action, the U.S. Air Force would also conduct clearing of runways, aprons, and taxiways within the North Field National Historic Landmark. No other changes would occur under the No Action Alternative. Therefore, there would be no impact on cultural resources.

4.5.3 Alternative 1

4.5.3.1 Training

Alternative 1 includes potential impacts related to land-based training events (aviation and ground) and operations and maintenance (biosecurity activities, road transit, and vegetation clearing). Nearly all of the 344 historic properties identified in Section 3.5.2.1 and listed in Appendix H are situated where non-live-fire training would occur within the Military Lease Area. The USMC proposes to divide the Military Lease Area into eight smaller training areas that can be used individually or in groups, as required, to control public access and maintain a safe separation of the public from certain training activities. This dynamic training environment would allow for areas to remain safely open for public access while training is occurring. The USMC also plans to re-utilize runway Baker in a manner consistent with its historic nature while meeting the military need. This approach for the Proposed Action meets the Secretary of the Interior's Standards for Rehabilitation of historic properties as defined in 36 C.F.R. 68.3(b), "making possible a compatible use for a property through repair, alterations, and additions while preserving those portions or features which convey its historical, cultural, or architectural values."

In addition, the number of activities proposed to occur within the North Field National Historic Landmark have been reduced significantly from the previous iteration of the Proposed Action, in part as a response to the recommendations of the 2016 National Park Service's Section 213 report. The USMC redeveloped the training concept in order to effectively minimize harm, as required by Section 110(f) of the National Historic Preservation Act. As a result, the Proposed Action evaluated in this EIS would result in less widespread limitations to public access across the Military Lease Area by proposing locations for the two live-fire ranges that minimize public access restrictions affecting the North Field National Historic Landmark, removing high hazard impact areas, eliminating new amphibious training, and reducing construction within the North Field National Historic Landmark, among other factors.

Non-Live-Fire Training

Non-live-fire training, both ground and aviation, and associated ongoing operations (biosecurity, road transits, and vegetation clearing required to maintain the ranges and other training infrastructure in order to support continuing military training) currently occur within the Military Lease Area. The potential for impacts to cultural resources from non-live-fire ground training activities would be limited to air and surface activities, to include foot traffic and vehicle use. To minimize impacts to cultural resources, air and vehicular activities including biosecurity, and road transits, would be limited to established paved and unpaved roadways and airfield infrastructure (i.e., runways, aprons, and taxiways), with only pedestrian training allowed in unimproved areas. Maintenance would include vegetation clearing along roads, live-fire ranges, Landing Zones, the North Field runways and a drop zone between runways Able and Charlie, and other components related to training, as needed. Vegetation clearing would not include discing or subsurface disturbance. Several proposed no training areas also prevent training impacts from occurring in these areas (refer to Figure 2.1-3). Alternative 1 would increase the tempo of existing ground and aviation training activities by approximately 15 percent above current levels, but would not change the type of training activities previously addressed by the 2022 *Mariana Islands Testing and Training Programmatic Agreement*. As described above, based on the nature of these training activities, less than significant impacts to cultural resources would result from implementation of

Alternative 1. The potential for impacts would be further reduced through the application of avoidance measures included in the amendment to the 2022 training programmatic agreement.

Live-Fire Training

Proposed Live-fire training at two new ranges, the Multi-Purpose Maneuver Range and Explosives Training Range, represent new activities that are part of this Proposed Action. A surface danger zone would become activated during live-fire training at either range and explosive safety quantity distance arcs would be activated when ammunition is temporarily staged at an ammunition holding area during training events (refer to Section 2.1.6 Live-Fire Range Safety Areas and Section 2.1.7 Ammunition Holding Areas). When activated, temporary access restrictions would apply within these designated areas to ensure safe separation from the public. The Multi-Purpose Maneuver Range is aligned so that the proposed surface danger zone would not overlay the North Field National Historic Landmark and its contributing features like the Atomic Bomb Loading Pits - thus these areas could be open to public access during live-fire training. Additionally, the overall size of the surface danger zone would vary based on the type of ammunition in use, so the smallest surface danger zone corresponding to the ammunition can be activated to further minimize the area where temporary restrictions would apply during live-fire training events.

Even though the location and operational design of the Multi-Purpose Maneuver Range minimizes the area where temporary restrictions would apply, the surface danger zone does overlap other cultural resources, as listed in Appendix H. However, several factors would further minimize potential effects to the character-defining features of these cultural resources should projectiles miss their targets and/or ricochet outside the boundary of the Multi-Purpose Maneuver Range to fall within the surface danger zone. These include: limiting the amount of vegetation clearing and ground disturbance within the boundary of the Multi-Purpose Maneuver Range; using small-sized ammunition; and directing ammunition use towards the designated targets within specific objective areas. On rare occasions, a projectile from the Multi-Purpose Maneuver Range may travel outside the target area but still land within the surface danger zone. In the unlikely event that a projectile enters coastal waters, the risk to cultural resources would remain very low. Specifically, after ricocheting, a bullet is deformed and loses considerable amount of velocity through air resistance. Due to this loss of energy, a cultural resource would have to be at or near the point of projectile impact to cause a measurable effect. Once a projectile enters the water, it would further lose energy and move quickly through the water column to settle on the sea floor. Therefore, it is unlikely that projectiles entering coastal waters would result in harm to cultural resources. In the case of the Explosives Training Range, construction of the range itself would result in the removal of several contributing features within the associated cultural resource (see Section 4.5.3.2 below), thereby eliminating any potential impacts to the associated cultural resources from the training within the range itself. The overall size of the Explosives Training Range (1 hectare [2.5 acres]), combined with the size of the ammunition and the distance from the range boundary, where the proposed detonations would occur, would result in a very low likelihood that ricocheted materials would reach the surface danger zone.

Operational changes associated with the Proposed Action may introduce temporary noise and vibrations with the potential to impact cultural resources. Yet given the type of cultural resources and noise measurements, as described in Section 4.8, noise and vibrations are not expected to impact cultural resources. Broadly, very high noise and vibration levels can, in extreme cases,

cause physical harm to certain resource types while less intense noise levels can also impact resources, such as traditional cultural places, by altering their setting. According to a 2010 study of noise and vibration impacts to historic structures, the peak decibels where impacts are seen to glass and plaster is 134 peak decibels (Naval Surface Warfare Center 2010). At 175 peak decibels, structural damage to lightweight superstructures is experienced. The type of cultural resources on Tinian are predominantly metal or concrete and do not fall under the material categories where noise and vibrations up to 140 peak decibels from the Explosives Training Range cause damage (refer to Section 4.8.1 Approach to Analysis for a description of the noise modeling and metrics used for the impact analysis). Even the Atomic Bomb Loading Pits, which are enclosed in glass interpretive panels, would experience 124 peak decibels from the Multi-Purpose Maneuver Range and 119 peak decibels from the Explosives Training Range, both of which are under the 134 peak decibels where glass cracks in a worst-case scenario. No traditional cultural places would experience elevated noise levels as a result of live-fire training. As a result, the type and size of ammunition or explosives proposed for live-fire training is not large enough to produce strong noise and vibrations to impact cultural resources. Therefore, there would be less than significant impacts to cultural resources from live-fire training.

Public Access

Public access within the area of potential effects would be limited during some training events, as required to preserve public safety. The proposed range design has considered the importance of public access to cultural resources, including the North Field National Historic Landmark and three identified traditional cultural places. To minimize effects, several key range components were sited in areas to lessen access restrictions. For example, the Multi-Purpose Maneuver Range surface danger zone originally overlapped the North Field National Historic Landmark Atomic Bomb Loading Pits. The placement of the range was redesigned so the surface danger zone would not overlap this feature, thereby lessening access restrictions that would apply to the North Field National Historic Landmark when live-fire training occurs. Additionally, as described earlier in this section, the area of potential effects would be divided into eight distinct training areas that can be closed individually or in groups as required to preserve public safety from certain training activities. This allows for the remainder of the training areas to remain safely open to the public even while training activities may be occurring. An on-island Range Control office would actively engage with the CNMI and Municipality of Tinian to avoid scheduling training on holidays, festivals, or other important days when public access within the Military Lease Area is desired. Range Control would provide notification to the public in advance of training that requires temporary access controls to maintain safety. These notifications would include information on the dates, times, and locations of planned closures so the public can plan to access areas within the Military Lease Area accordingly. Thus, access limitations to cultural resources of community and public importance would be temporary and minimal, and the above measures would further minimize potential impacts from training. As a result of additional avoidance and minimization efforts described above, impacts to cultural resources would be less than significant under Alternative 1. The potential for impacts would be further reduced through interpretive mitigation measures included in the construction programmatic agreement, especially the virtual tour, which would provide the community and visitors with an additional way to learn and engage with the cultural resources.

4.5.3.2 Construction

To avoid impacting cultural resources to the maximum extent possible, the USMC has sited construction components to avoid locations where cultural resources or contributing features are present. When impacts could not be avoided, locations were selected in areas containing the least amount of known cultural resources or contributing features in order to minimize impacts. The potential for direct impacts from construction activities may include ground disturbance (i.e., excavating, filling, grubbing), vegetation removal, vibrations from the use of construction equipment, or changes in setting through visual and audible intrusions to characteristics that are important to the significance of the cultural resources. There are aspects of the Proposed Action that would necessitate an assessment of effects under alternate Section 106 procedures when designs are finalized. These alternate procedures are included in the construction programmatic agreement and the activities include collaborative and conservation efforts with the CNMI and Municipality of Tinian such as firefighting and security, and the installation of water wells to support the expeditionary Base Camp.

Other types of activities that would continue after the construction of the Proposed Action components are complete would include ongoing operations and maintenance needed to maintain the range complex and Proposed Action components to support continued training throughout the Military Lease Area. This includes activities related to biosecurity, road transits, and vegetation clearing. Transportation of military personnel and equipment prior to the start and at the conclusion of training events would use transportation routes from the points of entry at the Port of Tinian, TNI, or North Field, to reach training areas within Military Lease Area. Transit would occur on existing or new roads established under the Proposed Action. No vehicle transit would occur off-road, either in association with or during training events. Maintenance vegetation clearing within the Military Lease Area would occur as needed to maintain access and the function of the training infrastructure (e.g., along paved and unpaved roads, Landing Zones, the North Field drop zone). Vegetation clearing would occur using hand or surface mechanical clearing only and would not include discing or subsurface disturbance. Vegetation clearing would visually restore the setting and feeling of cultural resources for which the character-defining features' related historic period is associated with widespread development and clearing. In other areas, vegetation would be left in place to screen construction activities. These types of operations and maintenance activities would not result in adverse physical, visual, or noise effects and would result in less than significant impacts to cultural resources.

Construction of the following Proposed Action components overlay one or more cultural resources (refer to Appendix H), but have been sited or would be designed to avoid impacts:

- The proposed location for the aircraft shelter is within an already disturbed portion of the U.S. Air Force's Divert lease area adjacent to TNI.
- The biosecurity facility at the Port of Tinian would be constructed on existing engineered surfaces, avoiding adjacent cultural resources.
- Facilities within the USAGM Tinian site would be reused to support Base Camp functions, including associated communication towers on both the USAGM Tinian and Saipan sites. New construction to install utilities, including a water storage tank, and to create the ammunition holding area within the USAGM Tinian site (AHA 2), would occur on previously disturbed land.

- Landing Zones 1 to 8 and 10 to 12 as well as the drop zone at North Field between runways Able and Charlie would require vegetation to be cleared and maintained.
- AM2 matting temporary airfield surface on Runway Baker at North Field National Historic Landmark would be placed over the runway and provides protection for the underlying surface - stakes to secure the matting would be placed within the associated engineered surface, but off the original runway surface, thereby not impacting this North Field National Historic Landmark contributing feature.
- Proposed water wells and tanks installed just south of the Multi-Purpose Maneuver Range in an area that is located within the most northeastern edge of the North Field National Historic Landmark boundary would be designed to have a low profile and mostly screened by existing vegetation as well as painted an inconspicuous color to blend in with the surrounding landscape.
- Utility lines (i.e., electrical, communication, and water) would be installed along either side of existing roadways in previously disturbed areas.

The construction of the Proposed Action components described above would not visually intrude on cultural resources given each project's small size relative to the existing expansive vegetation in the Military Lease Area and the lack of nearby character-defining features. Noise from construction equipment would be temporary and would not impact the setting and feeling or cause visual or physical damage to any of these resources from vibrations. Thus, impacts to cultural resources from the construction of these components would result in less than significant impacts to cultural resources under Alternative 1.

Construction of other training infrastructure would directly impact cultural resources, as identified in Appendix H. One cultural resource would be impacted by construction of the Multi-Purpose Maneuver Range, Landing Zone 13, and an ammunition holding area (AHA 1), the latter of which are located just south of the proposed range. The affected cultural resource is associated with the American Administration (World War II) period and includes remnant features such as concrete pads, ditches, and roads. Cultural surveys have identified many contributing features throughout the area covered by these three Proposed Action components. However, the overall impact from construction to the cultural resource would be less than significant as the area of disturbance would be minimal compared to the overall scale of the cultural resource. Only a small amount of vegetation would be cleared, representing approximately 13.5 percent of the total acreage within the Multi-Purpose Maneuver Range boundary. Across the disturbance area for the three components, only a small number of contributing features would be removed while many would be avoided.

Similarly, Landing Zone 9 overlays a small portion of a cultural resource associated with both American (World War II) and Japanese Administration (agriculture) periods. This cultural resource spans 163 hectares (403 acres) with over 250 contributing features, including large depressions, roads, earthen enclosures, berms, metal buildings, and a trench. There are 21 known contributing features within Landing Zone 9 that would be impacted by vegetation clearing and ground disturbance from the installation of temporary AM2 matting. However, the Landing Zone area comprises approximately 8 percent of the resource's total land area, and the removal of 21 features is relatively minor and would not diminish the resource's integrity or ability to convey its significance considering that it contains several hundred contributing features.

The Explosives Training Range is sited within one very large cultural resource that measures 170 hectares (420 acres) and is associated with the Japanese Administrative (agriculture) period. A cultural survey identified two cultural resource contributing features within the proposed range area - a concrete cistern and a dump with equipment and vehicle parts. Construction would result in the removal of these two features. The entire 1 hectare (2.5 acre) range footprint, however, comprises less than 1 percent of the expansive cultural resource site and would not adversely affect character-defining the features of the cultural resource.

Once construction is complete, the components described above (i.e., Multi-Purpose Maneuver Range, Landing Zones 9 and 13, ammunition holding area 1, and the Explosives Training Range) would have relatively low height profiles compared to adjacent vegetation, which would serve as a screen from most directions. Equipment used in the construction of these components would result in temporarily increased noise levels from the operation of machinery. However, there would be no visual or physical impacts to the setting and feeling or damage from vibrations to any cultural resources overlayed by the project components described above. Thus, despite the loss of some contributing features, the overall impact to these cultural resources would be less than significant. Impacts would be further reduced through the implementation of data recovery and recordation as stipulated within the construction programmatic agreement.

Surface radar tower 1 is situated within the southern edge of a cultural resource that measures 21 hectares (51 acres) and is associated with the Pre-contact period. Cultural surveys have recorded this area as disturbed, with surface scattered material and subsurface deposits identified closer to the middle of the cultural resource. The proposed location of surface radar tower 1 is also within the North Field National Historic Landmark, situated on the outskirts of the district's western boundary between Unai Babui and Unai Chulu. However, the proposed location for surface radar tower 1 does not overlap any known contributing features but would result in a visual adverse effect to the National Historic Landmark. Separately, the proposed location for surface radar tower 1 was also assessed for impacts to Unai Chulu, a traditional cultural place. The distance of the tower from the beach and presence of prevalent vegetation would negate any visual impact to the feeling or setting of this cultural resource, even though the tower would be located at a higher elevation than Unai Chulu. The presence of a new structure in this location, even when painted to blend in with the surroundings, would represent an adverse effect on the National Historic Landmark even though the overall impact to the cultural resource would remain less than significant for the reasons provided above.

The location of surface radar tower 2 is proposed within the boundary of a small cultural resource that measures 0.27 hectare (0.67 acre) at Ushi Point. The cultural resource is a remnant concrete pad associated with the American Administrative period. The proposed location is approximately 110 feet southwest of the Ushi Point Fisherman's Memorial and would be constructed on or near the remnant concrete pad. The tower would be set back from the northern tip of the point so it would not impede or affect the ocean view from the memorial. The reuse of the concrete pad is consistent with its historical use and the tower would be painted to blend in with the surrounding landscape. The presence of a new structure in this location would not visually affect cultural resources, but the physical construction on top of the American Administration cultural resource would cause adverse effects. The overall impact from the construction of surface radar tower 2 to the cultural resource, however, would remain less than significant because it is a historically consistent re-use and the tower would be painted to blend in with the surroundings. The interpretive

measures stipulated in the construction programmatic agreement, like the virtual tour, would serve to further lessen these impacts in addition to the minimization and avoidance efforts already described in the siting and design of surface radar towers 1 and 2. Therefore, the construction of surface radar towers 1 and 2 would result in overall less than significant impacts to cultural resources.

Collectively, the proposed location and design of the Proposed Action components described above considered ways to avoid or minimize impacts to known cultural resources and their contributing features (i.e., would be painted to blend in with the surrounding environment and/or concealed by existing vegetation). Further, mitigation stipulated in the construction programmatic agreement would seek to recover or record features that cannot be preserved in place to provide the community and public with interpretive tools that preserve the cultural importance of these resources. In total, construction efforts associated with the Proposed Action under Alternative 1 would result in less than significant impacts to cultural resources, and the implementation of avoidance, minimization, and mitigation measures, as referenced, would further ensure that impacts to cultural resources remain less than significant.

4.5.4 Alternative 2

Under Alternative 2, training would continue and increase over the No Action Alternative by approximately 5 percent, but this would represent a reduced tempo, approximately 10 percent less, than proposed training increases considered under Alternative 1. Impacts to cultural resources from training would be similar to those described under Alternative 1, as the types of impacts to cultural resources, namely foot traffic, would remain the same under Alternative 2. This training would occur across the broad landscape of the Military Lease Area and, given the types of cultural resources present as described under Alternative 1, would not degrade or impact character-defining features. The 5 percent increase in the frequency of temporary impacts (e.g., noise and visual impacts associated with human, vehicle, and aircraft presence) to cultural resources and particularly from public access controls to maintain safe separation during certain training activities (e.g., live-fire training at the Multi-Purpose Maneuver Range and Explosives Training Range) would remain similar to but less than those described for Alternative 1, but would not change the type of training activities previously addressed by the 2022 *Mariana Islands Testing and Training Programmatic Agreement*. Construction for Alternative 2 would be the same as described for Alternative 1 and would result in the same overall less than significant impact on cultural resources. Implementation of avoidance, minimization, and mitigation measures, as referenced in the construction programmatic agreement, would further ensure that impacts to cultural resources would remain less than significant under Alternative 2.

4.6 Visual Resources

4.6.1 Approach to Analysis

The analysis of impacts to visual resources considers changes to the visual conditions such as visual quality and viewer experience that could occur because of the Proposed Action. The analysis of visual impacts is based on the methodologies described in the National Park Service's *Guide to Evaluating Visual Impact Assessments for Renewable Energy Projects* (National Park Service 2014) and *Documenting America's Scenic Treasures: The National Park Service Resource Inventory* (Sullivan and Meyer 2016).

Five specific key observation points on Tinian (Figure 4.6-1) were selected from the seventeen viewpoints identified in Section 3.6 as representative locations for the development of visual simulations.

The following procedures were followed in selecting the key observation points:

1. Conduct a viewshed analysis that considers elevation, topography, and vegetative cover to determine the potential visibility from nearby lands. The viewshed analysis identifies areas with potential views of the Proposed Action, including sensitive scenic and cultural resources, and roads, trails, scenic overlooks, and beaches that may be visually impacted by the Proposed Action. This analysis resulted in the selection of specific viewpoints.
2. Establish and conduct field photography of selected viewpoints. The selected viewpoints represent specific well-known places, thoroughfares (e.g., Broadway), and views or scenic overlooks (e.g., beaches and Mount Lasso) that people are accustomed to seeing as part of the general landscape.
3. Assess the existing landscape from the viewpoints identified by evaluating form (i.e., mass or shape of an object), line (i.e., ridges, skylines, edges of waterbodies, change in vegetation type), color, and texture (i.e., light and shadow created by the variations in the surface of a landscape) of both natural and human-made elements. Other factors considered when assessing the existing landscape include scale, dominance, and extent of view (enclosed versus panoramic).
4. Prepare photo simulations of the primary elements of each action alternative from the selected viewpoints that show before-action and after-action views.

Construction activities, such as the operation of equipment and machinery, may contrast with the existing landscape and can draw the viewer's attention toward the construction location. Visual effects for short-term construction activities change frequently in terms of locations. Long-term visual effects are permanent changes to the visual characteristics of the site. In this context, those effects are addressed as operational impacts. The degree to which each proposed alternative permanently impacts views in terms of visual contrast was determined based on the definitions in Table 4.6-1.

Figure 4.6-1 Key Observation Points Selected for Visual Simulations

Table 4.6-1 Degree of Visual Contrast and Corresponding Impact Defined

Degree of Visual Contrast	*Corresponding Impact*	*Definition*
None	No Impact	The element contrast is not visible or perceived.
Weak	Less Than Significant	The element contrast can be seen but does not diminish the scenic quality of the landscape and is not substantially noticeable when viewed from sensitive viewpoints.
Minor	Less Than Significant	The element contrast can be seen, diminishes the scenic quality of the landscape to a minimal degree, and is potentially noticeable when viewed from sensitive viewpoints.
Moderate	Less Than Significant	The element contrast begins to attract attention, begins to dominate the characteristic landscape, begins to diminish the scenic quality of the landscape, and would easily be noticeable from sensitive viewpoints.
High	Significant	The element contrast begins to attract attention, begins to dominate the characteristic landscape, diminishes the scenic quality of the landscape, and would easily be noticeable from sensitive viewpoints. View importance may vary from high to low.
Strong	Significant	The element contrast demands attention, substantially alters the scenic value of the landscape, and dominates views from sensitive viewpoints.

Source: National Park Service 2014, 2016.

4.6.2 No Action Alternative

Under the No Action Alternative, there would be no change to ground and aviation training, which would be conducted at the same tempo as evaluated in previous NEPA documents (DON 2010a, 2015b) and associated consultations and authorizations. Construction associated with the U.S. Air Force Divert project (U.S. Air Force 2016, 2020) would continue until complete, estimated by 2026, when the new infrastructure and facilities at TNI would become operational. Additionally, projects under the U.S. Air Force's Agile Combat Employment program would also continue, with the clearance of vegetation and restoration of the runway and other engineered surfaces at North Field. As a result, North Field would have the appearance of a working airfield, with better maintained surfaces and less dense jungle vegetation in and around the immediate runway areas. The No Action Alternative would not change the visual environment at most of the Key Observation Points selected for analysis. The clearing and re-establishment of runways and taxiways at North Field would be a beneficial impact at Key Observation Points near North Field.

4.6.3 Alternative 1 and Alternative 2

The analysis of visual resources is structured differently from other resources in Chapter 4 by considering training events and construction together. Alternative 1 and Alternative 2 training differ only in tempo, not visual perspective, and both alternatives share the same construction of facilities. Alternative 1 training would increase over the No Action Alternative by approximately 15 percent. Alternative 2 training would increase over the No Action Alternative by approximately

5 percent. As a result, both Alternative 1 and Alternative 2 rely on the same viewpoints identified in Section 3.6 Visual Resources (Figure 3.6-1) and would have the same effects.

As stated above, the selected viewpoints represent specific well-known places, thoroughfares, and views and scenic overlooks that people are accustomed to seeing as part of the general landscape. In selecting viewpoints where Proposed Action components would be located, this analysis considered the potential number of viewers, frequency and duration of views, activities in which the viewers are engaged while viewing the landscape, the importance of scenic quality to these activities, viewer familiarity with the landscape, and viewer concerns for the landscape.

Comparison of the aesthetic character of each selected viewpoint with and without implementation of the Proposed Action allows for analysis of the resulting visual change. Table 4.6-2 shows the Tinian existing conditions ("before" picture) compared with future conditions ("after" simulated picture), and summarizes the potential visual impacts based on simulated conditions. Appendix I, *Visual Simulations*, provides the results of visual simulations for each of the selected Key Observation Points.

Training and support infrastructure would include night lighting at the following locations: Base Camp main gate; Base Camp approach from 8th Avenue to the guard shack and fence line; entry gates to water wells; and entry gates to surface radar sites. All lighting would be rated to limit light trespass in order minimize the potential for the new lighting to impair night sky viewing.

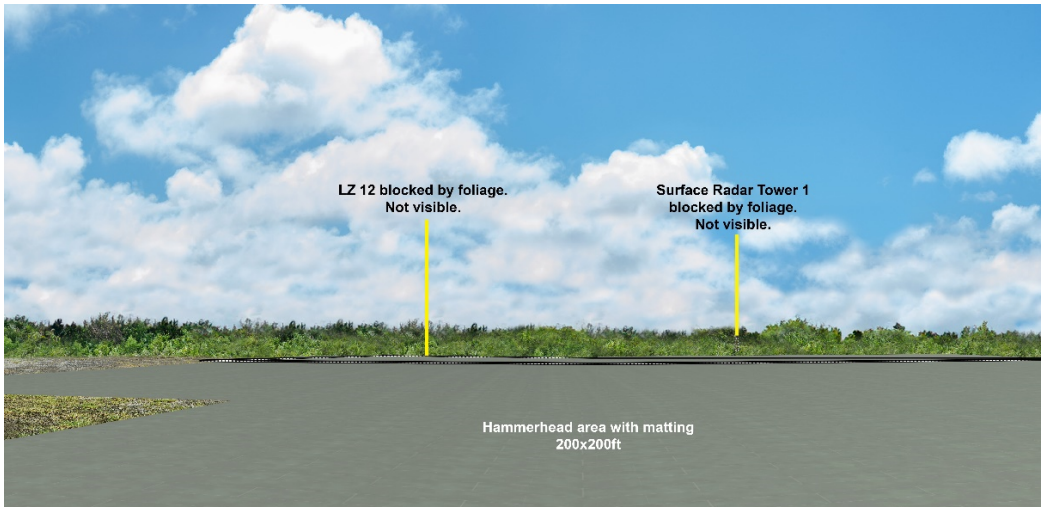
The USAGM Saipan site would continue to be used as a tower site for communication. This site is excluded from the following analysis as the Proposed Action at USAGM Saipan involves only small upgrades to existing communication equipment on existing towers. No new training or major construction activities are planned for this location. Therefore, there would be no impact to visual resources at the USAGM Saipan site.

Table 4.6-2 Evaluation of Proposed Action on Tinian Based on Visual Simulations

Selected Viewpoint	*Potential Visual Impact*
6: Unai Chulu, Looking North/ Northeast	**Training.** Training activities under Alternative 1 and 2 in this area would remain similar to existing training but would occur more frequently and include vehicle use of roadways and other improved surfaces with foot maneuver and pedestrian transits on unimproved surfaces with no ground disturbance. However, at this viewpoint the facilities would be blocked by foliage and not visible. Therefore, there would be less than significant impacts to visual resources. **Construction.** Temporary construction activities and equipment, fencing, and cleared areas, and the construction of surface radar towers 1 and 2 would not be visible due to intervening dense vegetation. There would be no impact to visual resources.  **Existing Conditions**  **Simulated Conditions**

Selected Viewpoint	*Potential Visual Impact*
7: Ushi Point at the Road, Looking North	**Training.** Training activities under Alternative 1 and 2 in this area would remain similar to existing training but would occur more frequently and include foot maneuver and pedestrian transits by small units, and surveillance activities from concealed observation points with no ground disturbance. Thus, there would be less than significant impacts to visual resources. **Construction.** Temporary construction activities and equipment, and the construction of surface radar tower 2 located at the end of the roadway leading to Ushi Point would be visible. A lookout and navigational aids have historically been located at Ushi Point and smaller structures are present at this location. The new surface radar tower 2 would introduce a larger profile of vertical and horizontal lines, and new/contrasting colors into the middle-ground of the viewshed for visitors driving to Ushi Point, but it would not present a visual barrier blocking or otherwise obscuring the view. The cleared areas, new fencing and equipment shelter would also add new/contrasting colors to the landscape in the middle-ground that would be visible to visitors. The structures would not be predominantly visible to visitors at the Ushi Point Fisherman's Memorial looking toward the ocean, but the existing scenic value of the landscape would be altered. Minimization measures such as painting the structure using a color palette consistent with existing landscape would serve to reduce these impacts. Therefore, there would be a less than significant impacts on visual resources. Existing and simulated conditions photos are shown on the following page.

Selected Viewpoint	*Potential Visual Impact*
7: Ushi Point at the Road, Looking North (continued)	 **Existing Conditions**  **Simulated Conditions**

11a: End of Runway Baker, Looking West	**Training.** Training activities under Alternative 1 and 2 in this area would remain similar to existing training but would occur more frequently and include vehicle use of roadways and other improved surfaces with foot maneuver and pedestrian transits on unimproved surfaces with no ground disturbance. Thus, there would be less than significant impacts to visual resources. **Construction.** Temporary construction activities and equipment, and the construction of surface radar tower 1 and clearing for Landing Zone 12 would occur. However, from this viewpoint, neither element would be visible due to intervening vegetation, distance, and the elevation at which they would be constructed (about 2,800 feet away and at a lower elevation than runway Baker). Additionally, a deployable metal matting surface would be installed on runway Baker which would have a slatted or brickwork pattern and be coated with a neutral-colored non-skid epoxy. Vegetation in cleared zones would be maintained at a height between 7 and 14 inches, extending about 500 feet from either end of the runway. These alterations would be consistent with the setting and feeling of the runway while protecting the existing runway surface below the metal matting. Thus, construction of the runway Baker improvements would be a less than significant impact.  **Existing Conditions**  **Simulated Conditions**

Selected Viewpoint	*Potential Visual Impact*
11b: Center of Runway Baker, Looking West	**Training.** During airfield training, the public would be restricted from accessing runway Baker. Therefore, there would be no impacts to public visual resources. **Construction.** A deployable metal matting surface would be installed on runway Baker, including at the end of the runway termed a hammerhead. The matting is an aluminum plank surface, assembled by hand in a brickwork pattern to form runways, taxiways, or aircraft aprons, and typically coated with grey non-skid epoxy. Vegetation in clear zones would be maintained at a height between 7 and 14 inches, extending about 500 feet from either end of the runway. These alterations would be consistent with the setting and feeling of the runway while protecting the existing runway. Thus, construction of the runway Baker improvements would be a less than significant visual impact.  **Existing Conditions**  **Simulated Conditions**

Selected Viewpoint	*Potential Visual Impact*
14: Mount Lasso Scenic Overlook, Looking Northeast	**Training.** Landing Zones would allow for the insertion or extraction of personnel and equipment from two to four aircraft, and also provide staging, field headquarters, camping, and gathering and rendezvous areas in support of distributed operations and logistics training. Because the Landing Zones can be seen, training activities are potentially noticeable when viewed from Mount Lasso. However, the views would be distant and partially obstructed by vegetation. Therefore, there would be a less than significant impact on visual resources. **Construction.** Temporary construction activities and equipment, and Landing Zones 9 and 10 would be visible from Mount Lasso. Views of Landing Zone 9 would be partially obstructed by vegetation. The Landing Zones would appear to the viewers as squares largely denuded of vegetation. The Landing Zones would be apparent, diminishing the scenic quality of the landscape but only by a moderate degree, and be noticeable when viewed from Mount Lasso. Therefore, there would be a less than significant impact on visual resources.  **Existing Conditions**  **Simulated Conditions**

Based on the findings from Table 4.6-2, visual impacts from training and construction under Alternative 1 and Alternative 2 would be less than significant.

4.7 Transportation

4.7.1 Approach to Analysis

The analysis described in this section considers the impacts to transportation networks on Tinian from training and construction activities. The ground transportation analysis uses the existing and proposed ground transportation volumes as part of the operational analysis of the roadways and intersections. The operational analysis requires inputs on the characteristics of the roadway such as the lane widths, speed limit, and signal timing to run its calculations. The analysis calculates performance measures, such as the delay, that are used when determining the level of service of

the roadways and intersections, which determines the impacts to the ground transportation network. The acceptable level of service for roadways and intersections is generally level of service D during the peak hour periods. Impacts are analyzed through changes in volumes or patterns of transportation caused by the addition of military vehicles, equipment, and supplies that would transit through TNI and the Port, and the ability of the existing ground, water, and air transportation infrastructure to support the Proposed Action.

4.7.2 No Action Alternative

Under the No Action Alternative, there would be no changes to ground and aviation training, which would be conducted at the same tempos as evaluated in previous NEPA documents (DON 2010a, 2015b) and associated consultations and authorizations. No construction is proposed under the No Action Alternative, although construction associated with the U.S. Air Force Divert project and the U.S. Air Force Agile Combat Employment program would continue. Therefore, there would be no impact to transportation under the No Action Alternative.

4.7.3 Alternative 1

4.7.3.1 Training

The training tempo under Alternative 1 would increase by approximately 15 percent over training already approved to occur on Tinian under the No Action Alternative.

Ground Transportation

This analysis conservatively assumes that all 30 to 50 personnel would be new to Tinian, adding 60 to 100 round trips per day once construction is complete. This additional traffic volume is a small percentage increase in traffic on the major roads that have daily traffic volumes greater than 1,000 vehicles per day, but is a larger percentage increase on the roads with a lower volume of daily traffic. During each training event, a training unit would bring its own vehicles and equipment. Vehicles such as High Mobility Multi-Purpose Wheeled Vehicles (Humvee), Joint Light Tactical Vehicles, and Medium Tactical Vehicle Replacement 7-ton trucks would support training. Other vehicles, including cars and light trucks, would support administrative and range functions. Equipment would include portable sensors and emitters, emergency generators and field safety equipment.

Periods of peak demand on roadways outside the Military Lease Area would occur immediately before and after each training event, as units arrive and depart with their required vehicles, equipment, and supplies. Personnel, vehicles, and equipment would arrive via TNI, North Field by military transport (e.g., KC-130 aircraft or similar), or by ship through the Port of Tinian. Personnel arriving at TNI would be transported by bus with a capacity of approximately 40 passengers to the Base Camp. If all 1,000 personnel arrive through TNI, this would result in approximately 25 round trips, or 50 individual bus trips, on local roadways between TNI and the Military Lease Area in the days immediately preceding and following a large training event.

Traffic may briefly increase near the Port and TNI during arrival and departure periods. However, all roadways on Tinian currently operate at level of service A, indicating free-flowing conditions with no significant delays or congestion. Any increase in traffic would be temporary and is not expected to reduce roadways below an acceptable level of service.

Once a training event begins, military vehicles and equipment would use both Broadway and 8th Avenue to access individual training areas and live-fire ranges as training occurs throughout the Military Lease Area. Within the Military Lease Area, Broadway carries approximately 130 vehicles per day and 8th Avenue carries approximately 70 vehicles per day, both operating at a level of service A. Military vehicles and equipment would be restricted to using existing roads or already disturbed areas in the Military Lease Area. Figure 4.7-1 shows the existing road network in relation to the Proposed Action elements such as Base Camp, ranges, and landing zones. The increase in people traveling within the Military Lease Area would be temporary and limited to the duration of the training event, with irregular travel patterns that would depend on the training events scheduled throughout the day. The proposed new road to the explosives training range would be constructed as a dead-end road only to serve as access to the range. The road would be restricted access for safety and security purposes for the general public and would not affect the level of service of other roads in the roadway network. Increased traffic during training events would be temporary, and all Tinian roadways would continue to operate at an acceptable level of service.

When roadway access would need to be restricted in a certain location during a training event, it would be coordinated through Range Control who would communicate temporary road closure locations and schedule in advance to the public. Road closures would also be temporary and the subdivision of the Military Lease Area into smaller training areas would help to reduce the number and duration of road closures.

It is estimated that training events would involve several different truck trips, adding vehicles to the roadways, and using approximately 1 million gallons of fuel per year. These additional trips would provide fuel for the base camp tanks that results in an average of 4 truck trips per week from Divert to the Base Camp, which could increase to 16 truck trips per week for large training events. The route between Divert and Base Camp is approximately 3.2 miles long. The other need for additional truck trips would be for the proposed biosecurity facility. The biosecurity facility would include an approximately 5,400 square foot wash rack with an oil-water separator and water storage tanks. Water from the water storage tanks would be trucked to and discarded at the Base Camp septic system as needed.

Any potential roadway deterioration from increased military road usage would be addressed through appropriate roadway maintenance in accordance with the *Administrative Amendment No.1 To The Lease Agreements Made Pursuant To The Covenant to Establish A Commonwealth Of The Northern Mariana Islands In Political Union*, dated February 2023.

Figure 4.7-1 Road Network in the Military Lease Area

DoD improvements to roads, both within and outside of the Military Lease Area, and regular roadway maintenance would have a beneficial impact. Impacts to ground transportation from training would be less than significant during training events, with most of the on-road vehicle trips occurring outside of the Military Lease Area for limited time periods around the start and conclusion of the event.

No training activities would be conducted at the USAGM Saipan site. Military traffic would be limited to occasional inspection and maintenance of communication antennae. Worker access to the wastewater treatment plant and visitor access to Agingan Point would not be impacted. Consequently, there would be no noticeable impact to traffic on Saipan.

Water Transportation

The Proposed Action does not include additional ships for training events. All water transit for training events would be covered under previous NEPA documents including the 2015 *MITT EIS/OEIS* and the 2020 *MITT Supplemental EIS/OEIS* (DON 2015b, 2020). Under Alternative 1, the arrival of ships bringing in and removing vehicles, equipment, and personnel for each training event would predominantly occur at the beginning and end of the training periods. All arrivals and departures would be scheduled with the harbor master in advance of any training event to deconflict with commercial Port traffic, including any ferries, and to ensure sufficient harbor support is available to offload and onboard military vessels. Given that the Port has adequate capacity to support existing training, and the Proposed Action does not include additional ships, Alternative 1 training activities would result in less than significant impacts to water transportation on Tinian. Impacts to travel time for boaters is addressed in Section 4.10, Public Health and Safety.

Air Transportation

Proposed aviation training events would occur within the Military Lease Area, primarily at North Field and proposed Landing Zones. Training events would include takeoffs and landings by fixed-wing, rotary-wing and tilt-rotor aircrafts, and unmanned aircraft systems. The training could also include coordinated ground and aviation training such as parachute drops, aviation command and control, ground refueling, and electronic warfare training. Aviation operations would be scheduled and coordinated with Range Control. Air traffic control for aviation training would also coordinate with air traffic control for commercial airlines to TNI and Saipan and ensure there is no conflict. Military aviation training within the Military Lease Area would utilize its own air traffic control. Military aviation training operations at North Field would not affect commercial operations at TNI because air traffic control coordination between the military and commercial airlines would deconflict flights.

In addition, to prevent potential conflicts with civilian commercial aircraft using the Instrument Landing System at Saipan International Airport when live-fire training is underway at the Multi-Purpose Maneuver Range, Range Control would coordinate flight scheduling with Saipan International Airport to ensure that military training units are aware of these commercial flight operations. Radar and spotters would continuously monitor the airspace to detect approaching aircraft. If an aircraft is seen to be approaching, all live-fire training would be suspended until the aircraft safely passed.

4.7.3.2 Construction

Construction materials and equipment imported into Tinian for proposed military construction projects would be brought in through the Port of Tinian in different phases throughout the period of construction. All port activity would be supported by biosecurity measures outlined in Section 2.1.9.2. Construction would be phased over approximately 10 to 15 years, and the materials and equipment would arrive using existing commercial transporters that import and export items through the Port. The addition of construction workers, materials, and construction equipment would result in temporary increased use of port and airport facilities, with the primary delivery of construction equipment and materials to Tinian through the Port but some lighter materials and equipment could be brought in via air as needed. The additional ship and air cargo flights during construction are within the capacity of the Port and TNI.

Impacts to ground transportation from construction activities under Alternative 1 would be less than those currently occurring with the development of the U.S. Air Force Divert project, which are less than significant. Divert, combined with the Divert supplemental pipeline project, requires a total of 225 workers (75 for the pipeline and 150 workers for the Divert field). The Divert pipeline project assumed 99 total trips by construction workers (14 trips per day for the pipeline and 85 trips for the Divert field). U.S. Air Force Divert construction activities are expected to be complete or near completion by the time Alternative 1 construction would begin in 2026.

The number of construction workers on-island would fluctuate depending upon which facilities are constructed in any given year, with the largest number of construction workers anticipated at any one time being approximately 50. Due to the limited labor force available on Tinian, it is likely that up to 70 percent (35 people) would come from off-island. The remaining 15 construction workers are assumed to come from the local population. In addition to construction workers, construction activities would result in an increase in vehicular volumes on the roadway network due to delivery and hauling of materials from the Port and TNI. The fluctuation in the number of workers and whether the workers were from the local population or from off-island affects the number of vehicle trips needed to arrive and depart from the project site. A larger volume of workers would require more vehicle round trips in general. The split between local workers and off-island workers affects the vehicle assumed to transport them to and from the project site.

Table 4.7-1 summarizes the assumptions for the construction-related trips along with the estimated number of round trips that would be added to the roadway network during construction. All trips would use local roadways, primarily Broadway and 8th Avenue, to reach construction sites within the Military Lease Area.

Table 4.7-1 Construction Assumptions and Estimated Number of Trips

Type of Trips	*Description*	*Round Trips per Day*
Personal Vehicles/Carpool or Passenger Van	Workers from the local population are assumed to carpool to the site. Assumes most would carpool with 3 to 4 people per vehicle, resulting in 10 round trips (5 trips in the morning and 5 in the afternoon). The remaining construction workers would stay in San Jose Village in local hotels or barracks style worker housing, such as those established to support the workers on the U.S. Air Force Divert project. Assumes passenger vans would be used to	20

Type of Trips	*Description*	*Round Trips per Day*
	transport 8-12 people resulting in approximately 10 round trips (5 in the morning and 5 in the afternoon).	
Miscellaneous Trips	Includes site inspections, water trucks, and other materials to support construction. Estimated 1 round trip per 25 construction workers per day. Results in 4 additional trips per day (2 to the site and 2 from the site). Trips would be distributed throughout the day.	4
Construction Support Trips	Approximately 17,000 to 22,000 trips for clearing and construction and additional trips for concrete and debris hauling distributed over the course of a 10 to 15-year construction period. Assumes approximately 20 round trips per day for all activities. Trips would be distributed throughout the day.	20

Construction activities under Alternative 1 would add an additional 44 trips per day to the existing roadway network over the course of the 10 to 15 year construction phasing. The segment of Broadway south of the Military Lease Area carries about 1,560 vehicles per day south of 42nd Street and 300 vehicles per day north of 42nd Street, and 8th Avenue carries approximately 140-180 vehicles on the segment outside of the Military Lease Area. The trips transporting construction workers would be occurring during the morning and afternoon periods, which would add some congestion on the roadway network but would not affect the level of service of the roadways.

Construction truck movements may result in isolated impacts including damage to roads, congestion, slower speeds in construction zones, temporary roadway closures, temporary access restrictions to construction sites and short detours caused by equipment movement, delivery of construction materials, removal of construction debris, and roadway improvements. Other related construction trips would be distributed throughout the day and have minimal effect on roadway traffic as the roadways have adequate capacity to support these additional traffic volumes.

To reduce construction impacts, traffic control plans would be developed to provide guidance on how to direct traffic during the construction phase. Traffic control plans would describe lane configuration, appropriate signage, detour routes, and other strategies and equipment that would be needed to maintain vehicular access along roadways. Traffic control plans could be included with a traffic and work zone management plan that would provide contractors sufficient details and directions to use during construction.

Most construction activities under Alternative 1 would occur within the Military Lease Area. Traffic and work zone management plans would further minimize construction impacts on traffic circulation and access to areas around the construction sites. Even with some slight overlap of Divert construction traffic, all roadways would still operate at acceptable levels of service. The increase in traffic volumes related to the additional trips per day would not increase the level of service of the roadway such that it reaches an unacceptable level of service. In addition, construction would include clearing some existing roads and opening additional routes of transportation. The opening of additional routes of transportation would benefit traffic by providing more roads to disperse the traffic through. Impacts to transportation from construction activities under Alternative 1 would be less than significant.

No construction activities would be conducted at the USAGM site on Saipan. Military traffic would be limited to installation of communication equipment on existing towers and occasional inspection and maintenance of communication towers. Worker access to the wastewater treatment plant and visitor access to Agingan Point would not be impacted. Consequently, there would be no impact to traffic at the USAGM Saipan site.

4.7.4 Alternative 2

Under Alternative 2, training would increase over the No Action Alternative by approximately 5 percent, which is approximately 10 percent less than Alternative 1. The size of training events would remain the same, including the same number of people and equipment arriving and departing for each event. This would result in the same volume of activity at the Port and TNI for Alternative 2 and a small increase in traffic on Tinian for any given training event compared to the No Action Alternative. For ground transportation, a 5 percent training increase would not change the level of service for any roadways on Tinian. Improvements to roads would be a beneficial impact such as paving or re-paving of the roads to improve safety and the longevity of the road. Training associated with Alternative 2 would result in fewer impacts to transportation than Alternative 1, and impacts would be less than significant. Alternative 2 would include the same construction activities and impacts as Alternative 1 and would also be a less than significant impact.

4.8 Noise

This section evaluates the potential noise effects on human populations. Effects on specific resources from noise are also presented in their respective sections in this Revised Draft EIS–potential effects to land uses from noise are discussed in Section 4.2, socioeconomic-related impacts on domesticated animals in Section 4.3, wildlife in Section 4.4, and cultural resources in Section 4.5. Additional background information on the basics of sound and the potential effects of noise can be found in "Discussion of Noise and Its Effects on the Environment," which is provided as Attachment 1 to Appendix J, *Noise Study*. Specific topics include land use compatibility, noise-induced vibration effects, noise-induced hearing impairment and non-auditory health effects, noise effects on children, domestic animals, and wildlife.

4.8.1 Approach to Analysis

This noise impact analysis evaluates potential changes to the baseline noise environment with implementation of training and construction activities under the Proposed Action, considering both long-term changes to cumulative sound levels and short-term effects from a single event or peak noise level. The resulting noise exposure is evaluated at Tinian and the southern portion of Saipan. These include locations with noise-sensitive land uses such as residential, schools, places of worship, and natural and cultural resources, as identified in Section 3.8. The analysis also considers whether noise from the Proposed Action would exceed any applicable standards.

4.8.1.1 Methodology

The Proposed Action would result in sounds produced by military training and construction. Typical noise levels generated by construction equipment are used to evaluate potential impacts from construction activities within the Military Lease Area. Noise from military training activities would be principally generated from the use of small arms and explosives during ground training

activities, and helicopters, fixed-wing (propellor-driven or jet), and tilt-rotor aircraft during aviation training. The analysis examined these Proposed Action elements and relevant research to determine the appropriate noise modeling approach to accurately depict potential noise impacts, including the use of noise modeling software developed for these activities. Details on these noise modeling software programs are summarized in Table 4.8-1, and described in detail in Appendix J.

Table 4.8-1 Noise Modeling Software

Type of Noise Modeled and Proposed Location	*Software Name and Managing Agency*	*Modeling Notes*
Live-Fire Training Small Arms at Multi-Purpose Maneuver Range	Small Arms Range Noise Assessment Model (SARNAM): Developed by US Army and Approved for DoD use	Used to estimate noise levels from the use of small caliber munitions. For the Proposed Action, ammunition up to 0.50 caliber would be used. This includes different types of ammunition commonly used during training, such as 5.56 mm and 7.62 mm, at the Multi-Purpose Maneuver Range. The largest ammunition would be used less frequently. Additional inputs include the location and configuration of the range (e.g., distances between firing points and targets), approximate number of days the range is utilized annually, weapons to be fired at each of the ranges, percent of night firing, and information on range physical features such as land and water data to account for greater sound reflection as sound propagates over water versus over land.
Live-Fire Training Ordnance at Multi-Purpose Maneuver Range and Explosives Training Range	Blast noise model (BNOISE): Developed by US Army and Approved for DoD use	Used to estimate blast noise from the use of ordnance and explosive equipment. For the Proposed Action, a maximum 40 pounds net explosive weight would be used infrequently, approximately 2 to 4 times per year, only at the Explosives Training Range. Smaller amounts of explosives would be used more regularly for training, including charges with a net explosive weight of approximately 1.25 pounds (Multi-Purpose Maneuver Range or Explosives Training Range) or 10 pounds (Explosives Training Range).
Aviation Activities Training at North Field, Landing Zones, and within the Military Lease Area and Cargo Transport Operations at TNI	Aircraft noise model (NOISEMAP, which includes NMAP, AAM, and MRNMAP): Developed and approved for DoD use	Used to analyze noise generated by military aircraft operations by developing estimated noise levels at identified sensitive receptors and noise contours around airfields and Landing Zones. For the Proposed Action, inputs include the types of aircraft, flight patterns, variations in altitude, power settings, number of operations, and hours of operation.
Graphical plotting tool for all types of noise modeling shown above	Noise contour plot program (NMPLOT)	Used to plot modeled noise levels on a grid and identify areas of equal noise levels—shown as contour lines—to help determine noise exposure in different geographical areas.

Legend: mm = millimeter; TNI = Francisco Manglona Borja / Tinian International Airport.

Due to more sporadic live-fire training and aircraft operations in the Military Lease Area and at North Field, annual activity assumptions were used to estimate a "busy month" scenario for the cumulative noise analysis. With more regular aircraft operations at TNI, the analysis for this activity utilized the average annual conditions for the cumulative noise analysis. Single event peak or maximum noise levels augment the cumulative noise analysis results, which applies to equipment and ordnance that would commonly be used at each live-fire range and typical aircraft for aircraft related training activities.

4.8.1.2 Noise Metrics and Effects of Noise

Noise is generally described as unwanted sound, based on both objective effects (e.g., hearing loss or damage to structures) or subjective judgments (e.g., community annoyance). A noise analysis thus requires assessing a combination of physical measurements of sound, physical and physiological effects, plus psycho- and socio-acoustic effects. The response of different individuals to similar noise events is diverse and influenced by the type of noise, the perceived importance of the noise, its appropriateness in the setting, the time of day, the type of activity during which the noise occurs, and the sensitivity of the individual.

As described in Section 3.8, with additional detail provided in Appendix J, noise and sound levels are expressed in logarithmic units measured by decibels, with the unit "dB" (refer to Table 3.8-1 and Figure 3.8-1). The A-weighting scale has been adopted by the Occupational Safety and Health Administration for its noise standards, as this measurement is thought to provide a rating of noise that predicts the injurious effects on human hearing (Occupational Safety and Health Administration 2022). A few example sound levels in A-weighted decibels are summarized below for reference (Berglund and Lindvall 1995):

- 0 decibels = approximate threshold of human hearing, which is barely audible under extremely quiet listening conditions
- 60 decibels = equates to normal speech at a distance of about 3 feet
- Greater than 120 decibels = sound begins to be felt inside the human ear as discomfort
- 130 to 140 decibels = sound levels felt as pain

The minimum change in sound level of an individual event that the average human ear can detect is about 3 decibels, while a 10 decibel increase in sound level will generally be perceived as a doubling (or halving with a decrease) of a sound's loudness (DoD Noise Working Group 2009a).

Cumulative metrics are used to describe, assess, and predict long-term noise exposure and represent the sound level from all noise-generating activities conducted throughout the day, usually averaged over an extended period of time. Single event metrics are used to describe, assess, and predict annoyance associated with occasional loud impulsive events, when the sound is experienced for a brief period of time. Impulsive noise results from an instantaneous event that produces a sharp sound (like a crack or pop from small arms fire or explosive detonation).

In accordance with DoD guidelines and standard practice for environmental impact analysis documents, the appropriate noise metric depends upon the type of activity analyzed. The day-night average sound level (or "DNL") represents an average of all noise activities conducted throughout the day, including periods of no activity, light training, and heavy training while accounting for periods at night when people are more sensitive to noise. Therefore, this metric does not describe

a noise level heard directly but instead represents a measure of intrusiveness or annoyance over the assessment period. The day-night average sound level and C-weighted day-night average sound level (or "CDNL," which is a version of DNL applicable to live fire activity) are metrics to predict the noise environment at airfields, airspace, and ranges when considering compatible land use and assessment of noise impacts on noise-sensitive receptors. Noise from military training is also assessed in this Revised Draft EIS by considering the unweighted peak and maximum sound levels from single events (i.e., and aircraft flying overhead or impulsive noise such as small arms fire or explosions) to provide a description of the noise levels people may experience during a training event. The metrics used in this evaluation are described in Table 4.8-2.

Table 4.8-2 Primary Metric for Significance Analysis and Additional Effects Metrics

Activity Type	*Metric (Primary or Additional Effect) and Reference*	*Description*
Live-Fire Training Explosives Detonations	Primary: Peak sound level PK15(met) in dBP (USMC 2021)	The PK15(met) metric is used to describe the maximum or peak sound level produced by a single impulsive noise event such as blast, which would be heard for a fraction of second. Blast noise may be loud enough to startle people or animals. The duration of the blast or explosion would last for only a few milliseconds but increases as the sound moves further from the point of origin, similar to thunder. This metric accounts for statistical variations from weather. Single event metrics are used to assess if a noise event would interfere with activities and produce annoyance, which is usually described in DoD planning guidelines correlated to a complaint risk. However, this metric does not capture how long sounds may be heard, which would affect how the noise may be experienced. For example, a series of small detonations that happen consecutively versus being spaced out over hours or days may result in different levels of annoyance.
Live-Fire Training Small Arms	Primary: Peak sound level in dBP (USMC 2021)	This metric is used to describe the maximum or peak sound level produced by a single impulsive noise event such as a small caliber gunshot, which would be heard for a fraction of a second. The DoD treats small arms noise differently from blast or aviation noise, because the single event metric provides a better predictor of annoyance. Additionally, it is more conservative than a cumulative metric like DNL/CDNL that may understate the intensity of impulsive events like small arms fire, which can be particularly annoying to residents or other noise-sensitive receptors.
Aviation Activities	Primary: Day-night average sound level (DNL) in dBA (USMC 2021)	This metric uses annual operations at an airfield or landing area to calculate the average sound level over the course of a year. A-weighting is used to better reflect the frequencies people actually hear.

Activity Type	*Metric (Primary or Additional Effect) and Reference*	*Description*
		The DNL contours are depicted on a map and used to evaluate land use compatibility and future planning, as described for the CDNL metric, above. Consistent with DoD and FAA guidance, 65 dB DNL is used to show areas with potential for annoyance in this analysis. However, aircraft noise does occur outside the 65 dB DNL contour.
Aviation Activities	Additional Effects: Maximum sound level (L_{max}) and sound exposure level (SEL) in dBA (USMC 2021)	The maximum sound level or L_{max} is measured during a single event where the sound level changes value with time (e.g., an aircraft overflight). The L_{max} is the maximum, instantaneous level of noise that a particular event produces, and it is most closely related to what an individual would hear. However, this metric does not describe how often that sound would occur (e.g., multiple aircraft flying after each other or helicopters hovering or maneuvering in a small pattern near land). This metric is used in the analysis of the effects of noise on speech interference, including speech in the classroom and potential effects on recreation. The sound exposure level or SEL is the most common measure of cumulative noise exposure for a single aircraft flyover. SEL does not directly represent the sound level heard at any given time but condenses the entire event—starting from the ambient or background noise level, rising to the maximum level as the aircraft flies closest to the observer, and returning to the background noise level as the aircraft moves further away—into a 1-second period of time. During an aircraft flyover, SEL would include both the maximum sound level and the lower sound levels produced during onset and recess periods of the overflight to represent the entire sound exposure received. A-weighting is used to better reflect the frequencies people actually hear.

Legend: dB = decibels; dBA = A-weighted decibels; dBC = C-weighted decibels; dBP = peak sound pressure level in unweighted decibels; CDNL = C-weighted day-night average sound level; DNL = day-night average sound level; DoD = Department of Defense; FAA = Federal Aviation Administration; L_{max} = maximum sound level in A-weighted decibels; SEL = sound exposure level in dBA.

4.8.2 No Action Alternative

Under the No Action Alternative, training events including both ground maneuver and aviation activities would continue in the Military Lease Area at the same tempo as described in previous NEPA documentation (DON 2010a, 2015b). In addition, all actions related to the U.S. Air Force Divert project would be implemented including aircraft operations that are projected to occur annually at TNI.

Under this baseline condition, there would be no change to the current levels of ground and aviation training on Tinian. Activities that are the equivalent of a large training event, such as

Valiant Shield, and smaller events that utilize ground vehicles and equipment and fixed- and rotary-wing aircraft at North Field would continue to occur throughout the year within the Military Lease Area. The aircraft training activities center around North Field, with materials and supplies also arriving by air through TNI. TNI would additionally be used for military divert operations, humanitarian assistance staging, exercises, and other aircraft support activities. Noise levels at representative sensitive receptors would remain the same as the baseline levels shown in Table 3.8-3. Additionally, civilian jets would continue to periodically fly at low altitudes (approximately 2,200 to 2,600 feet) over runway Able at North Field on approach to the Saipan International Airport.

North Field runway Able is used for military fixed-wing and helicopter activities during training. North Field runway Baker is used for parachute drops and helicopter activities. These relatively low altitude activities may occur below flight paths used by large commercial jet aircraft on approach to Saipan. Therefore, since there would be no changes to existing noise levels, the No Action Alternative would remain the same and result in no new noise impacts.

4.8.3 Alternative 1

4.8.3.1 Training

Ground Training

Non-Live Fire

Alternative 1 represents an approximate 15 percent increase in training activities from the No Action Alternative in terms of military vehicles and equipment traveling to conduct activities throughout the training areas in the Military Lease Area. There are no residences, schools, or churches located within the Military Lease Area, but there are cultural and natural resources present. In addition, members of the public conducting subsistence activities or agricultural users may visit the Military Lease Area throughout the day and evening. The sound level from ground vehicles experienced during a training event would vary depending on the distance away from the source–for example being very close to vehicles while operating (e.g., 25 to 50 feet) could produce sound levels in the 80 to 90 decibel range, which may sound like being within 50 feet of a heavy truck while it is running (refer to Figure 3.8-1 in Section 3.8 Noise). The sound levels generally decrease as the distance to the source increases, but environmental and weather conditions can either amplify or dampen the sound level experienced at any given time (e.g., effects of wind, humidity, topography, vegetation may cause variations in how loud the sound seems at the same location at different times). Noise from ground vehicles and equipment used for training would remain similar to the No Action Alternative, and would generally result in sound levels of 50 to 60 decibels at noise sensitive receptor locations. This sound level would be similar to standing 10 feet away from a vacuum cleaner or 100 feet away from an automobile or air conditioner while they are operating (refer to Figure 3.8-1 in Section 3.8 Noise). Therefore, non-live-fire ground-based training would result in less than significant noise impacts.

Live-Fire Training

Live-fire training would present new sources of noise concentrated in specific areas within the Military Lease Area, at the Multi-Purpose Maneuver Range and the Explosives Training Range. Noise-producing events would be intermittent over the course of any given year, and be interspersed with quieter times when less noise-producing activities or even no military training

would be audible. For all live-fire training events, Range Control would provide advance notification to the public of access restrictions required to preserve a safe separation for civilians not participating in training and information on what activities may be seen or heard (i.e., small arms or blast noise, as appropriate). As described in the previous section, the primary metric used to evaluate impacts from training activities at the two proposed live-fire ranges is the peak noise level, which is the most conservative method. Additionally, the noise study in Appendix J provides a cumulative analysis of the proposed explosives activity to ensure that the day-night average sound level would not present land use incompatibilities. Modeling assumptions and results are detailed in Appendix J, *Noise Study* (refer to Section J.3.3).

Small Arms Firing at the Multi-Purpose Maneuver Range. Small caliber rifles and machine guns create impulsive noise, characterized by brief bursts of sound pressure, typically lasting less than a second, but many impulsive sounds could occur in series for longer durations (e.g., multiple service members shooting rifles or a machine gun firing upward of 400 rounds per minute). This is why the DoD uses the peak sound level, and not a cumulative metric, to estimate land use compatibility near areas where small arms fire occurs. Therefore, peak sound levels in unweighted decibels, denoted as "dBP", are used to convey the absolute "loudness" of each individual shot.

The DoD has established thresholds for evaluating the impact of small arms fire at different sound levels (MCO 3550.13, *Range Compatible Use Zones Program*). Impulsive sounds may create a startle effect if the noise occurs unexpectedly, like a clap of thunder. While responses to noise vary, in general, individuals exposed to peak sound levels less than 87 decibels would not be disturbed by the noise event. As the peak sound level increases, the risk of annoyance increases. To provide context to interpret modeled peak sound levels, Table 4.8-3 shows the percentage of people who are highly annoyed from small arms range noise at different peak sounds levels and Table 4.8-4 provides peak noise levels for a variety of common noise sources.

Table 4.8-3 Percentage of Population Highly Annoyed by Small Arms Noise

Peak Sound Level (dBP)	*Percentage Highly Annoyed (%)*
80	4
85	10
90	13
95	21
100	29
105	38

Legend: % = percent; dBP = unweighted decibels.
Source: Sorenson and Magnusson 1979, as cited in DoD Defense Noise Working Group 2018.

Table 4.8-4 Peak Sound Levels for Common Noise Sources

Peak Sound Level (dBP)	*Noise Source*
76	Safety whistle at approximately 50 feet
95-112	Thunderstorm at varying distances
105-145	Restaurant
117-137	Balloon pop at approximately 3 feet
<130	Movie theater
139	Average rock, pop, or rap concert
143-152	Cap gun at <1 foot
153	Pull-apart firecracker at approximately 0.5 feet
169	Airbag at driver's ear

Legend: < = less than; dB = unweighted decibels.
Source: DoD Noise Working Group 2013.

Figure 4.8-1 shows the estimated peak sound levels for representative weapons and ammunition that would be used at the Multi-Purpose Maneuver Range. Range Control would provide advance notice to the community of the training schedule and types of noise that may be heard, and would restrict public access within the surface danger zone during live-fire training. The surface danger zone generally encompasses the land area around the Multi-Purpose Maneuver Range where the 104 decibel contour overlaps. Thus, members of the public would not be present in areas that would experience peak sound levels above 104 decibels. Peak sound levels between 87 and 104 decibels would reach as far as the southernmost runway at North Field and extend over the waters north and northwest of Tinian. At these levels, sound may cause a startle effect and would be considered moderately likely to produce annoyance especially for people who are not accustomed to hearing gunfire noise. Recreational and cultural sites in this area include T16: North Field National Historic Landmark, T20: Ushi Point, and T20: Unai Lam Lam. Areas located south of North Field on Tinian would hear peak sound levels of 87 decibels or less when small arms training occurs, which may sound like a series of bangs, pops, or lower rumbling sounds like a distant thunderstorm (i.e., would be audible but not as likely to cause disturbance or be perceived as annoying). Depending on the weather and other conditions that may affect sound propagation, small arms training may be audible across the Saipan Channel at certain times but would be at levels below 87 decibels and would similarly not be anticipated to cause disruptions or annoyance.

Explosives Detonation at the Multi-Purpose Maneuver Range and Explosives Training Range. Noise generated by ordnance or explosive detonations, referred to as "blast noise," is modeled with the peak noise metric PK15(met) (refer to Table 4.8-2), which is different than the peak noise metric used for small arms. As with small arms, the resulting noise levels are presented in unweighted decibels and are intended to convey the "loudness" of each individual detonation, which lasts only a fraction of a second. The actual sound level a receptor experiences is dependent on highly variable factors such as weather (e.g., cloud cover, humidity, precipitation), wind, and temperature. The same explosive detonation occurring in the same location on the Explosives Training Range could result in different sound levels being heard at a single receptor location from day to day or even hour to hour, by as much as 40 decibels. In general, sound levels would be higher when the receiver is located downwind from a source, and prevailing winds on Tinian are southeast to northwest (i.e., would lessen the sound levels heard in areas of San Jose and Saipan).

Figure 4.8-1 Peak Sound Levels (Unweighted Decibels) from Small Arms Firing at the Multi-Purpose Maneuver Range

However, when a weather event like a temperature inversion occurs, distant sounds may sound much louder or be heard at further distances (DoD Noise Working Group 2018). A temperature inversion results when air near the ground cools more quickly than the air above it. The warm air sitting above the cooler air functions like a lid, and sound waves change direction when hitting the warmer air, refracting the sound differently than on a typical day (i.e., when air temperatures decrease with height). Temperature inversions are more likely to occur on clear days with light and variable winds (less than 3 miles per hour) when conditions are dry and in the vicinity of areas with low elevations where cool air can sink and collect (Midwestern Regional Climate Center 2025). These conditions could occur in the CNMI during the drier, less windy times of the year, which may result in differing sound levels from the same training activity. When using the PK15(met) metric, the noise modeling software accounts for environmental variation so the actual peak sound level experienced when the detonation occurs should be at or below the modeled peak sound level at least 85 percent of the time.

Threshold levels for single event blast noise are also defined differently from small arms. Peak sound levels at 115 decibels or less would be considered audible but are unlikely to produce annoyance; at peak sound levels between 115 and 130 decibels the risk of annoyance becomes moderate as events may be noticeable and distinct from other sounds; at peak sound levels of 130 decibels or greater the sound is very loud, may cause a startle effect, and the risk of annoyance becomes high. The peak sound level from blast noise is experienced for only a fraction of a second per detonation, and a number of detonations may occur throughout a day with quiet periods in between, which is why the cumulative C-weighted day-night average sound level is used to evaluate community compatibility with longer term exposure to the activity MCO 3550.13, *Range Compatible Use Zones Program*).

At the Multi-Purpose Maneuver Range, training would include the use of C-4 explosive with a net explosive weight of up to 1.25 pounds but could also include practice grenades, training rockets, and antipersonnel obstacle breaching charges. Ordnance use at the Explosives Training Range would involve higher net explosive weights and thus charges with varying net explosive weights were modeled to represent the variation that would occur. Detonations of the largest cratering charge (40 pounds net explosive weight) would occur infrequently, up to 4 times per year. The intermediate charge (10 pounds net explosive weight) and smaller breaching charge (1.25 pounds net explosive weight) would be more commonly used during training events, at a rate of approximately 12 and 15 charges per quarter, respectively. The full noise modeling results and noise contour maps for proposed live-fire training can be found in Appendix J, Section J.3.3.2 Noise Exposure.

As shown in Figure 4.8-2, similar to small arms, the 130 decibel peak sound level contour from explosives detonations would fall within the boundary of the surface danger zone, and thus public access would be restricted when this type of training would occur at the Multi-Purpose Maneuver Range. Peak sound levels between 115 and 130 decibels would reach to the southernmost runway at North Field and extend over the waters north, northwest, and northeast of Tinian. This would be similar to sound levels experienced when at a movie theater, music concert, or a loud restaurant (Table 4.8-4), and may create a startle response if the sound is not expected. Recreational and cultural sites in this area include T16: North Field National Historic Landmark, T20: Ushi Point, and T20: Unai Lam Lam.

Figure 4.8-2 Peak Sound Levels (Unweighted Decibels) from Typical Explosive Equipment Detonation at the Multi-Purpose Maneuver Range

Areas south of North Field and across the channel at the southern tip of Saipan would hear peak sound levels of 115 decibels or less when training using explosives occurs at the Multi-Purpose Maneuver Range. Receptors in these areas, such as the residential and commercial zones in the southern portion of the island, could potentially hear these live-fire training events but the sound may be perceived similar to a balloon being popped 3 feet away or a nearby thunderstorm (refer to Table 4.8-4).

As depicted in Figure 4.8-3, the largest charge that would be used at the Explosives Training Range would generate peak sound levels of 140 decibels or greater that extend approximately 1 mile in all directions except for the area north of the 110th Street and west of Mount Lasso, where the sound level is reduced due to the terrain and elevation change. One area of wetlands located southwest of the Explosives Training Range (T6: Bateha 1 Isolated Wetlands) would experience a peak sound level of 140 decibels or greater. The area that would experience peak sound levels between 130 and 140 decibels extends approximately half a mile beyond the 140 decibel contour and covers the middle of the island, from just south of 86th Street to just north of the traffic circle at 116th Street and Broadway, and just west of 8th Avenue out over the ocean approximately 0.5 miles east of Unai Dankulo. Two points of interest are located in this zone–a wetland area located west of the Explosives Training Range (T8: Bateha 2 Isolated Wetlands) and T14: Unai Dankulo. Depending on the weather and other environmental factors, it is likely the detonation of the largest charge would be audible at a peak sound level between 115 and 130 decibels (i.e., likely to produce moderate annoyance) across the remainder of Tinian, with the exception of the northwestern section of the island shielded by the ridgeline southwest of Mount Lasso, across the channel to the southern tip of Saipan, and across a large area of open ocean, extending approximately 5 to 7 miles to the east and west of Tinian.

Figure 4.8-4 depicts peak sound levels for the intermediate charge. Sound levels would be similar in nature to those described for the largest charge, but the area encompassed by each contour shrinks slightly. Sensitive receptors that would potentially experience peak sound levels greater than 140 and between 130 and 140 decibels remain the same for the intermediate charge. The 140 decibel contour extends out approximately 0.8 miles from the center, and the 130 decibel contour still extends approximately 0.5 miles from the edge of the 140 decibel contour, with the exception of the northwestern section of the island where, due to the shielding provided by the ridgeline elevation, peak sound levels would generally remain at or below 115 decibels for all modeled net explosive weights. However, the area that would experience peak sound levels between 115 and 130 decibels is greatly reduced, extending from just south of TNI to just north of the runway Able at North Field, and from just east of Riverside Drive to out over the ocean approximately 2.5 miles beyond Unai Dankulo.

Except for the residential area just northeast of Marpo Heights, the southern third of Tinian where commercial and residential areas are concentrated would experience peak sound levels below 115 decibels (i.e., low potential for annoyance). The southern portion of Saipan across the channel would also experience similar sound levels. Peak noise at this level would likely cause low annoyance where it may blend in with the ambient noise environment and could sound like a distant thunderstorm or a moderately loud restaurant (refer to Table 4.8-4). As depicted in Figure 4.8-5, the smallest charge would affect an even smaller area than the intermediate charge, but the 115 decibel contour would extend approximately 2 miles in every direction from the Explosives Training Range and stay almost entirely within the Military Lease Area.

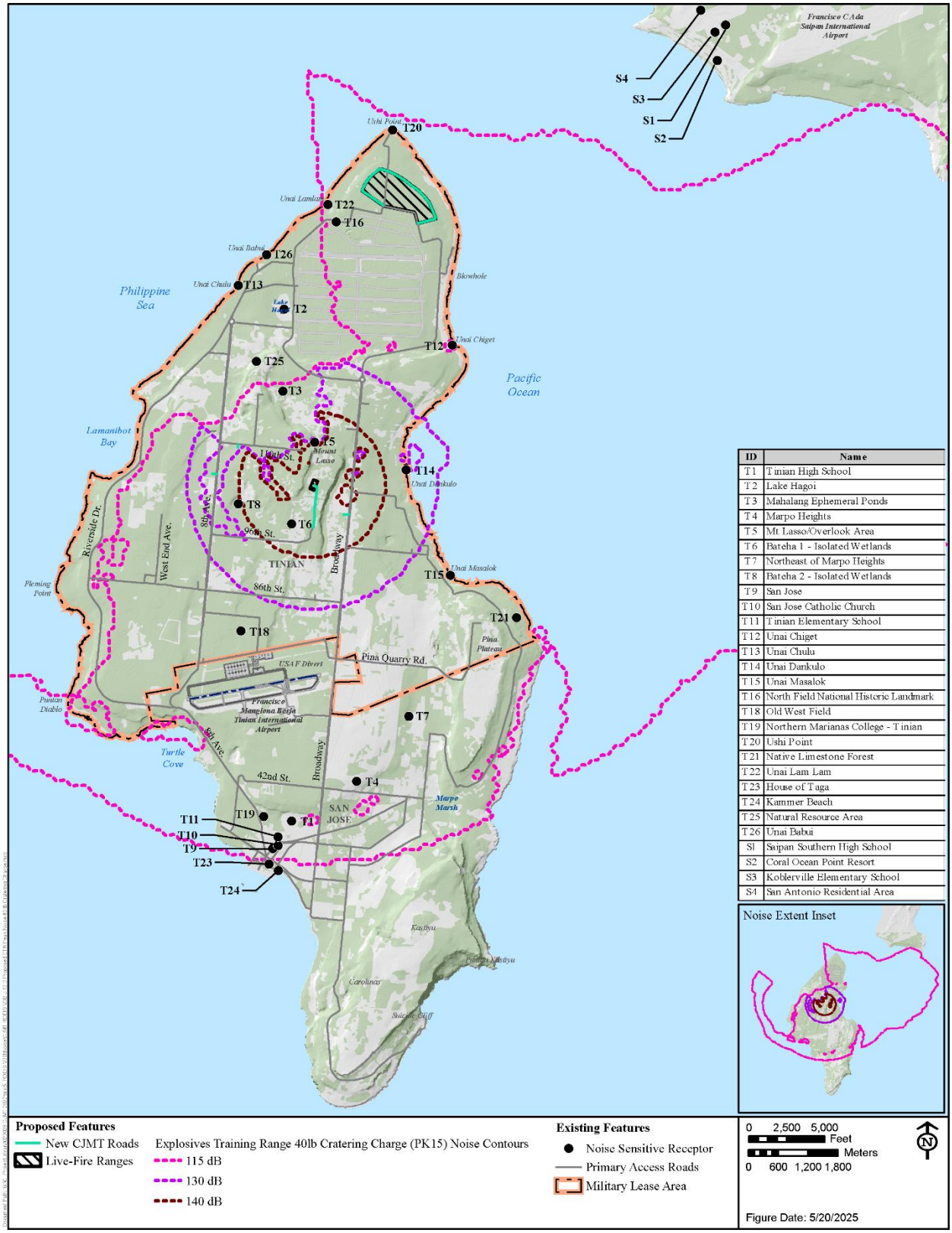


Figure 4.8-3 Peak Sound Levels (Unweighted Decibels) from a 40 Pound Net Explosive Weight Detonation at the Explosives Training Range

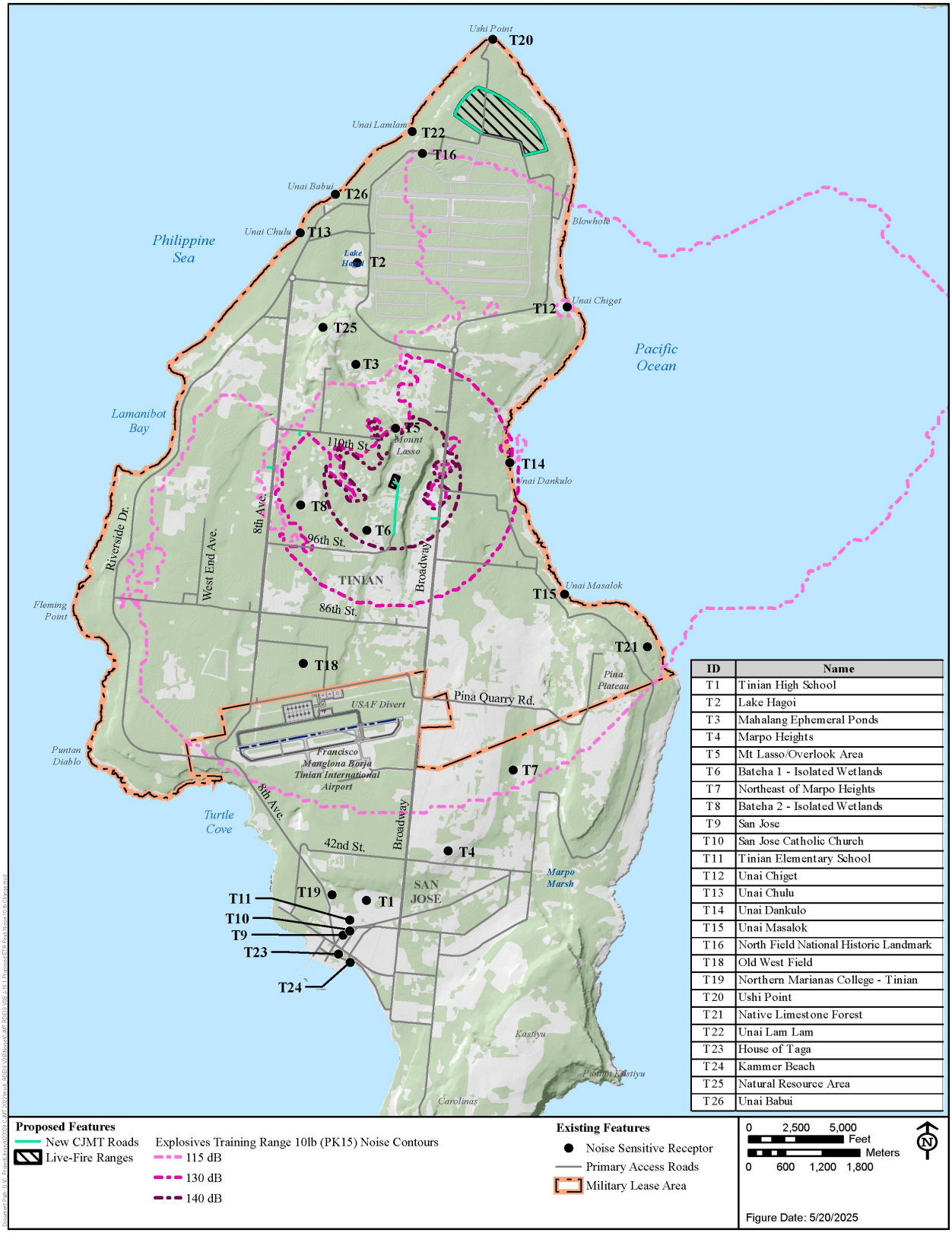
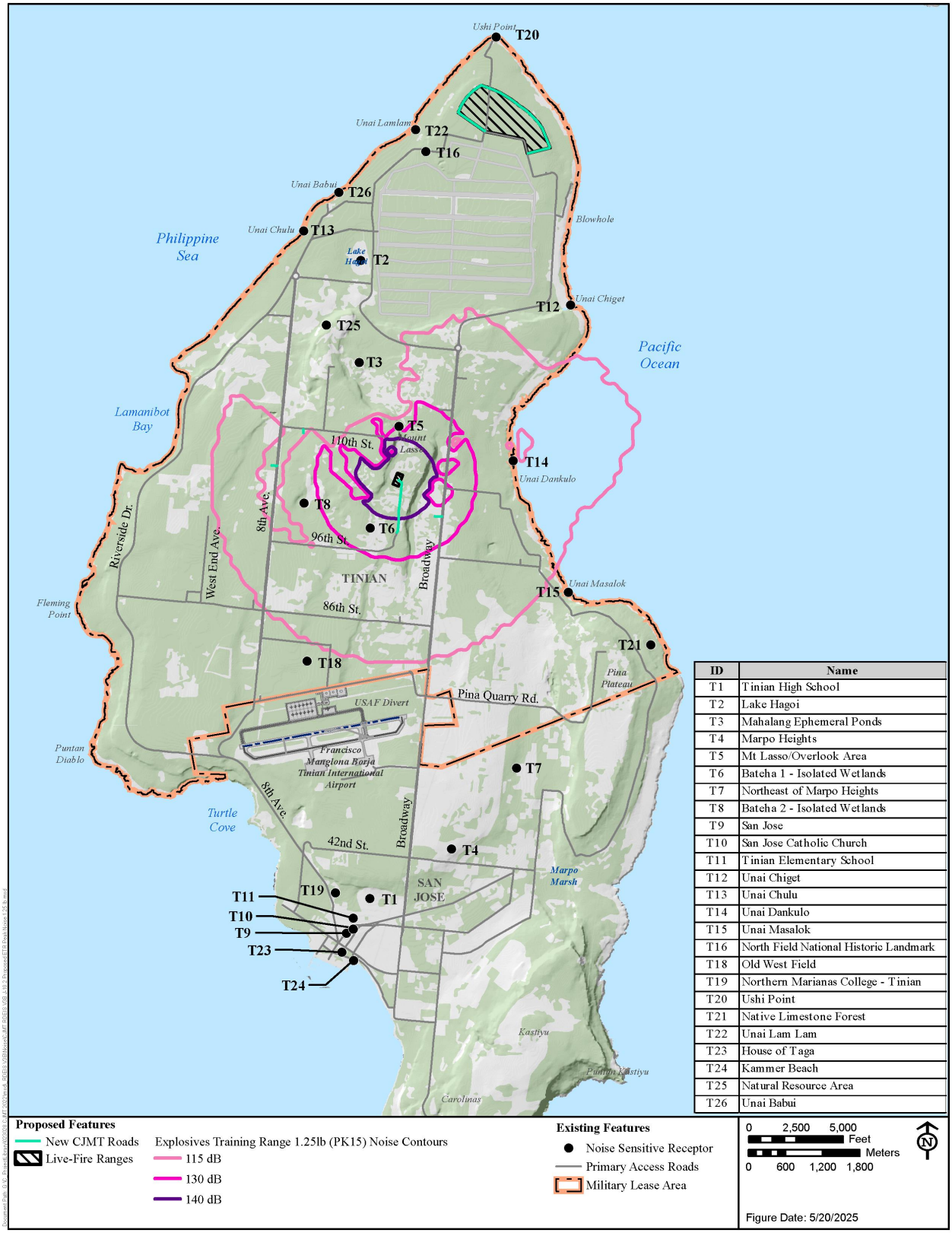


Figure 4.8-4 Peak Sound Levels (Unweighted Decibels) from a 10 Pounds Net Explosive Weight Detonation at the Explosives Training Range



ID	Name
T1	Tinian High School
T2	Lake Hagoi
T3	Mahalang Ephemeral Ponds
T4	Marpo Heights
T5	Mt Lasso/Overlook Area
T6	Bateha 1 - Isolated Wetlands
T7	Northeast of Marpo Heights
T8	Bateha 2 - Isolated Wetlands
T9	San Jose
T10	San Jose Catholic Church
T11	Tinian Elementary School
T12	Unai Chiget
T13	Unai Chulu
T14	Unai Dankulo
T15	Unai Masalok
T16	North Field National Historic Landmark
T18	Old West Field
T19	Northern Marianas College - Tinian
T20	Ushi Point
T21	Native Limestone Forest
T22	Unai Lam Lam
T23	House of Taga
T24	Kammer Beach
T25	Natural Resource Area
T26	Unai Babui

Figure 4.8-5 Peak Sound Levels (Unweighted Decibels) from a 1.25 Pounds Net Explosive Weight Detonation at the Explosives Training Range

The limits of the 115 decibel contour are just north of TNI to the south, south of the North Field runway area, at West End Avenue to the west, and only extends approximately 0.5 miles over the water to the east of Unai Dankulo. Table 4.8-5 presents the peak sound levels in unweighted decibels that would occur at select sensitive receptors as a result of live-fire training at both the Multi-Purpose Maneuver Range and the Explosives Training Range.

Table 4.8-5 Peak Noise Levels (Unweighted Decibels) at Points of Interest on Tinian and Saipan from Explosives Detonations at Proposed Live-Fire Ranges

ID	*Description*	*Type*	*Multi-Purpose Maneuver Range[1] (dBP)*	*Explosives Training Range[2] (dBP)*
T1	Tinian High School	School	90	117
T4	Marpo Heights	Residential	93	118
T5	Mount Lasso Overlook Area	Natural Resource	102	126[3]
T6	Bateha 1 – Isolated Wetlands	Natural Resource	98	148
T7	Northeast of Marpo Heights	Residential	94	120
T8	Bateha 2 – Isolated Wetlands	Natural Resource	99	138
T9	San Jose	Residential	92	116
T11	Tinian Elementary School	School	92	116
T12	Unai Chiget	Cultural Resource	109	123
T14	Unai Dankulo	Cultural Resource	102	137
T15	Unai Masalok	Cultural Resource	98	126
T16	North Field National Historic Landmark	Cultural Resource	124	119
T18	Old West Field	Cultural Resource	96	125
T19	Northern Marianas College – Tinian	School	92	117
T20	Ushi Point	Natural Resource	122[3]	116
T22	Unai Lam Lam	Cultural Resource	122[3]	104
T26	Unai Babui	Natural Resource	110	104
S2	San Antonio Residential Area	Residential	108	112
S4	Koblerville Elementary School	School	108	113

Legend: dBP = peak decibels.

Notes: Results presented here as exterior noise levels. Typical building construction results in a reduction of noise of level of 15 dB with windows open and 25 dB for windows closed (DoD Noise Working Group 2013).
Refer to Table 4.8-4 for typical peak noise levels for common sounds, such as the peak sound level from: thunderstorms at varying distances (95 to 112 decibels); restaurant (105-145); balloon popping around 3 feet away (117 to 137 decibels); average concert (139 decibels).

[1] Modeled charge size: 1.25 pounds net explosive weight.

[2] Modeled charge size: 40 pounds net explosive weight. This peak level would occur 2-4 times per year.

[3] Range Control would restrict public access to this area during live-fire training as it is located within the surface danger zone for the associated live-fire range.

For all live-fire training events, Range Control would provide advance notification to the public of access restrictions required to preserve safety according to the nature of the training scheduled to occur. The notifications would provide information on what activities may be seen or heard (i.e., small arms or blast noise, as appropriate). In addition to potential annoyance from hearing sounds from live-fire training, visitors and residents may experience inconvenience from having to adjust plans to visit alternate areas of the Military Lease Area if they are sensitive to noise at lower peak

levels, or fuel costs associated with driving to alternative recreation or cultural sites within the Military Lease Area where public access remains unrestricted. However, these impacts would be temporary and would occur intermittently over the course of any given year, and interspersed with quieter times where less noise-producing activities or even no military training would be audible. Additionally, with temporary access restrictions put in place by Range Control, the public visiting the Military Lease Area would not experience noise at levels that would present a risk for hearing loss. Therefore, ground training would result in less than significant impacts on human receptors from noise.

Aviation Training

Cumulative (Annual Average) Noise Impacts

TNI and Military Lease Area (North Field and Landing Zones). Under Alternative 1, the existing KC-135, F-18E/F, and F-35A/B/C activity currently occurring at TNI would remain the same while other military aircraft operations would increase by 15 percent, related to transport of materials, equipment, and personnel to support training. Total airfield operations at TNI would increase less than 1 percent, from 29,207 to 29,308. As with the baseline condition, each landing or take-off is counted as an operation for noise modeling purposes and majority of operations would take place during the day (approximately 75 of operations occurring during the acoustic day, between 7 a.m. and 10 p.m.). No sensitive receptors would experience a day-night average sound level of 65 decibels or greater due to operations at TNI under Alternative 1 (Figure 4.8-6).

Under Alternative 1, military flight training in and around Tinian would also increase, as described in Chapter 2 and additional modeling details are presented in Appendix J. Approximately one half of the additional military flight time would occur within the Military Lease Area or within 1 mile from shore. Training within the Military Lease Area would involve helicopters or tilt-rotorcraft (such as CH-53, AH-1, UH-1, and MV-22) flying approaches, hovering, and landing at the proposed Landing Zones. Additionally, these helicopters and tilt-rotor aircraft, as well as fixed wing fighters (F-18E/F and F-35A/B/C) and tankers (KC-130) would fly approaches to and takeoffs from the runways in North Field.

Figure 4.8-7 depicts the day-night average sound level contours for the Military Lease Area under Alternative 1. Aviation training at North Field would result in noise contours that would extend both west and east from runway Baker primarily due to military aircraft operations. There are five locations within the 65 decibel day-night average sound level: T2: Lake Hagoi at 70 decibels; T12: Unai Chiget at 65 decibels, T13: Unai Chulu at 76 decibels, T16: North Field National Historic Landmark at 65 decibels, and T26: Unai Babui at 76 decibels. These locations are just beyond the western edge of the North Field runways, and outdoor recreational activities at these sound levels are generally still considered to be compatible. Under Alternative 1, the training activity proposed at Landing Zones would result in a day-night average sound level contour of 65 decibels or greater centered around each Landing Zone, but the boundary does not extend much beyond the footprint of each Landing Zone. This occurs because the lowest portion of each operation (less than 30 feet and down to the ground) only occurs within the Landing Zone boundary. Aircraft operations beyond the boundary of each Landing Zone would be at greater altitudes and be spread throughout the Military Lease Area.

Figure 4.8-6 Day-Night Average Sound Level Contours (A-weighted Decibels) at TNI under Alternative 1

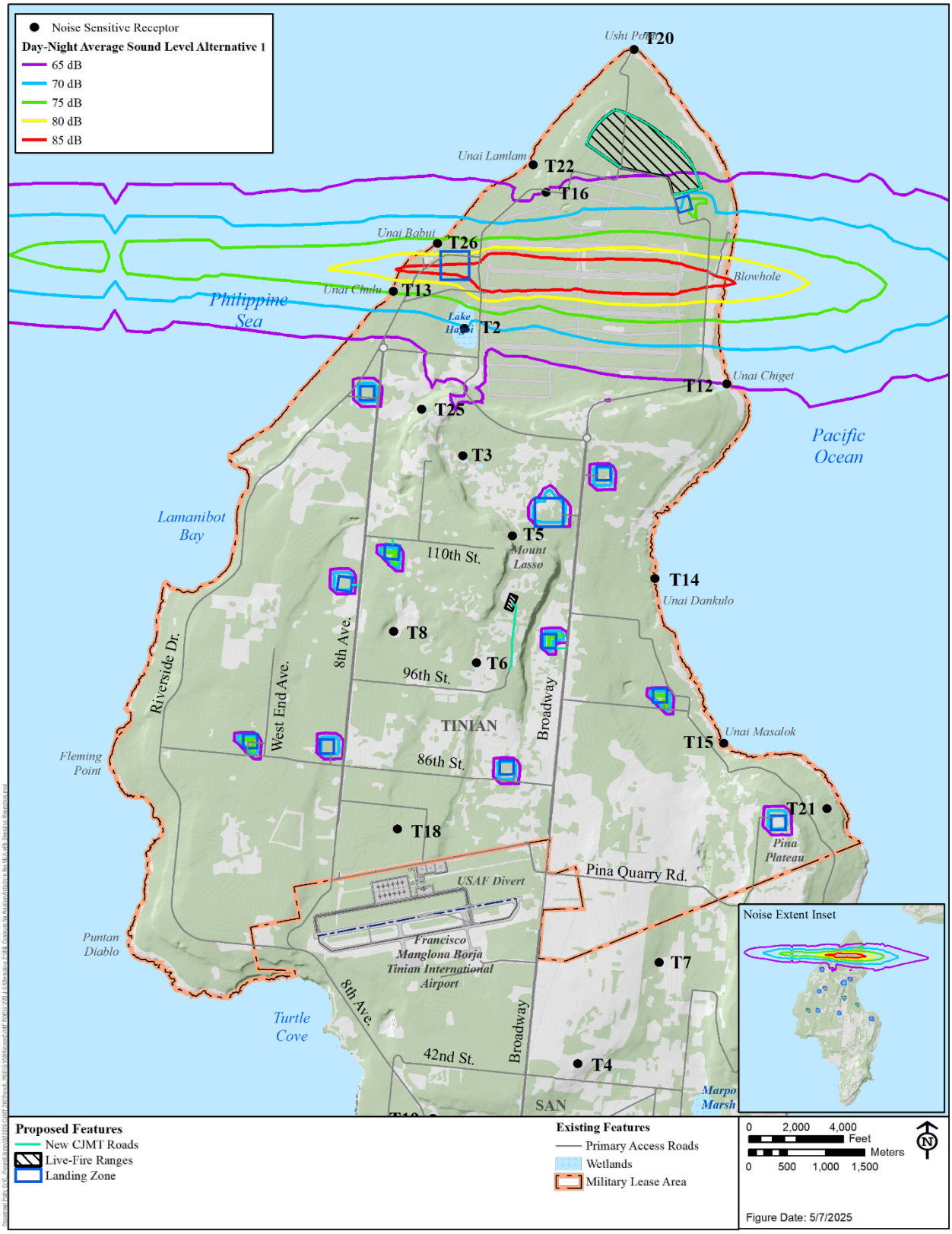


Figure 4.8-7 Day-Night Average Sound Level Contours (A-weighted Decibels) in Military Lease Area under Alternative 1

Table 4.8-6 presents the noise levels at select sensitive receptors when considering the additional operations at TNI and aviation training proposed to occur at North Field and Landing Zones throughout the Military Lease Area. The cumulative day-night average sound levels presented in Table 4.8-6 and depicted in Figures 4.8-6 and 4.8-7 are meant to characterize long-term exposure to noise for the purpose of determining land use compatibility and identifying when indoor or outdoor noise level reduction measures may be appropriate to achieve compatibility for various types of uses. In general, all land uses are considered to be compatible with a day-night average sound level below 65 decibels and land uses that involve outdoor activities are not recommended in areas with sound levels above 80 decibels.

Table 4.8-6 Alternative 1 Aviation Training - Modeled Day-Night Average Noise Levels at Sensitive Receptors on Tinian

ID	*Description*	*Type*	*Alt 1 Noise Level – DNL (dB) / Change from Modeled Baseline*[1]
T2	Lake Hagoi	Natural Resource	70 / +26
T3	Mahalang Ephemeral Ponds	Natural Resource	60 / +20
T5	Mount Lasso Overlook Area	Natural Resource	55 / +10
T6	Bateha 1 – Isolated Wetlands	Natural Resource	49 / +3
T8	Bateha 2 – Isolated Wetlands	Natural Resource	49 / +5
T12	Unai Chiget	Cultural Resource	65 / +27
T13	Unai Chulu	Cultural Resource	76 / +34
T14	Unai Dankulo	Cultural Resource	51 / +5
T16	North Field National Historic Landmark	Cultural Resource	65 / +25
T20	Ushi Point	Natural Resource	53 / +17
T22	Unai Lam Lam	Cultural Resource	62 / +24
T25	Natural Resource Area	Natural Resource	57 / +15
T26	Unai Babui	Natural Resource	76 / +38

Legend: dB = decibels; DNL = day-night average noise level; ID = identification.
Notes: [1] Noise levels calculated based on aircraft activity that occurs at TNI and military aviation training throughout the Military Lease Area, including use of North Field and landing zones (Appendix J, *Noise Study*). Results presented here as exterior noise levels. Typical building construction results in a reduction of noise of level of 15 dB with windows open and 25 dB for windows closed (DoD Noise Working Group 2013).

There would be no human populations regularly gathering at sensitive receptors that fall within the 65 decibel day-night average sound level contours shown in Figure 4.8-6 or 4.8-7. Additionally, no sensitive receptors would experience a day-night average sound level of greater than 80 decibels due to operations at TNI, North Field or Landing Zones under Alternative 1. The single event noise metrics presented further below in this section are used to evaluate noise impacts that may be experienced by people visiting natural or cultural resources within the Military Lease Area while aviation activities are occurring.

Additional Noise Effects

Single Event Noise from Aviation Training

Table 4.8-7 presents single event noise levels from aircraft flying over the airspace to North Field or Landing Zones in the Military Lease Area. The sound exposure level and maximum sound level provide the noise level of a single aircraft event in A-weighted decibels. However, these metrics do not represent a continuous source of noise, as the flight activities are intermittent in nature.

Table 4.8-7 Single Event Noise Levels (Sound Exposure Level and Maximum Sound Level) for Common Military Aircraft Operating Conditions

Altitude (ft AGL)	*MV-22 at 80 kts*		*CH-53 at 80 kts*		*AH-1/UH-1 at 80 kts*		*F-35A/B/C at 220 kts*		*F-18E/F at 220 kts*		*KC-130 at 220 kts*	
	SEL (dB)	*L_{max} (dB)*	*SEL (dB)*	*L_{max} (dB)*	*SEL (dB)*	*L_{max} (dB)*	*SEL (dB)*	*L_{max} (dB)*	*SEL (dB)*	*L_{max} (dB)*	*SEL (dB)*	*L_{max} (dB)*
300	98	91	97	91	96	88						
500	95	86	95	87	93	84						
2,000	89	75	87	73	87	73	110	102	111	104	85	77
5,000							100	90	101	93	76	66
10,000							90	80	91	82	67	56

Legend: ft AGL = feet above ground level; kts = knots (speed); dB = decibels; L_{max} = maximum sound level; SEL = sound exposure level.

Note: Modeled at a constant speed and altitude.

In terms of the magnitude of noise, helicopter or tilt-rotor overflights at 300 feet above ground level would produce a single event maximum sound level of 88 to 91 decibels, or a sound exposure level of 96 to 98 decibels. Similar sounds at that level would occur from a heavy truck driving by less than 50 feet away or a motorcycle at 25 feet, which can be annoying or cause discomfort for a brief period of time. Overflights at 500 feet would be quieter, more equivalent to the sound of an alarm clock or garbage disposal at 3 feet away. Although fixed-wing aircraft (i.e., F-18E/F and F-35A/B/C) would generate greater maximum sound levels of up to 102 to 104 decibels and a sound exposure level of up to 111 decibels, these sound levels would generally only occur within the vicinity of the runways at North Field during an approach or departure. Range Control would implement mandatory safety exclusion zones to restrict access for the general public when and where required to avoid exposure to sound levels that would be potentially harmful. Fixed-wing aircraft operate primarily at altitudes greater than 10,000 feet above ground level and pass through the lower altitudes in a matter of seconds to minutes, and therefore noise exposure would be of short duration. Table 4.8-8 presents the maximum A-weighted sound level from aircraft operations at select points of interest under Alternative 1.

Table 4.8-8 Alternative 1 Aviation Training Maximum Noise Levels at Sensitive Receptors on Tinian and Saipan

ID	*Description*	*Type*	*L_{max} (dB)[1]*
T1	Tinian High School	School	104
T2	Lake Hagoi	Natural Resource	102
T4	Marpo Heights	Residential	107
T5	Mount Lasso Overlook Area	Natural Resource	100
T6	Bateha 1 – Isolated Wetlands	Natural Resource	99
T7	Northeast of Marpo Heights	Residential	97
T9	San Jose	Residential	93
T10	San Jose Catholic Church	Church	94
T11	Tinian Elementary School	School	96
T12	Unai Chiget	Cultural Resource	95
T13	Unai Chulu	Cultural Resource	108
T14	Unai Dankulo	Cultural Resource	104

ID	Description	Type	L_{max} (dB)[1]
T15	Unai Masalok	Cultural Resource	99
T16	North Field National Historic Landmark	Cultural Resource	100
T18	Old West Field	Cultural Resource	102
T19	Northern Marianas College – Tinian	School	103
T20	Ushi Point	Natural Resource	91
T21	Native Limestone Forest	Natural Resource	105
T22	Unai Lam Lam	Cultural Resource	99
T24	Jones (Kammer) Beach/Park	Natural Resource	98
T25	Natural Resource Area	Natural Resource	104
T26	Unai Babui	Natural Resource	108
S1	Saipan Southern High School	School	87
S2	Coral Ocean Resort/Golf Course	Resort	92

Legend: dB = decibels; ID = identification; L_{max} = maximum sound level.
Note: [1] Results presented here as exterior noise levels. Typical building construction results in a reduction of noise of level of 15 dB with windows open and 25 dB for windows closed (DoD Noise Working Group 2013).

For aircraft noise, a maximum A-weighted sound level between 70 to 80 decibels corresponds to a low likelihood of annoyance, between 80 and 95 decibels produces a moderate likelihood of annoyance, and above 95 decibels there is a high likelihood of annoyance when the sounds in this range occur frequently (approximately 50-200 operations per day) (DoD Noise Working Group 2018). The aircraft operations at North Field and Landing Zones would not occur on a regular schedule, as with commercial aircraft activities at TNI. Aircraft activity would occur most frequently during large training events but would also occur periodically throughout the year during medium and small events. However, based on the single event noise levels presented in Table 4.8-7 and the distance of sensitive receptors such as residences and schools from the Military Lease Area, interruptions to conversations or indoor speech or classroom learning would be unlikely to occur. The screening criteria for classroom learning impacts begins at 60 decibels day-night average sound level, and no schools are located in areas that would experience a day-night average sound level exceeding 50 decibels.

Additionally, although aircraft operations at North Field and throughout the Military Lease Area would not directly create noise impacts on Saipan, aviation activity under Alternative 1 would result in increased numbers of aircraft (like F-35A/B/C) transiting through the general area north of Tinian, which may result in an increase in the number of military flights that could be heard from the southern portion of Saipan. Sleep disruption refers to noise events occurring during the nighttime that could interfere with people's sleep. Under Alternative 1 the increase in nighttime flights at TNI would increase by less than 1 percent from baseline, nighttime training in the Military Lease Area at night would occur far from residential areas.

Summary

Under Alternative 1, there would be live-fire and aviation activities that occur at the same time, especially during large training events. Live-fire and aviation activities would also occur during medium training events and less frequently during small training events. Overall, the proposed training in the Military Lease Area, live-fire and aviation training, would generate elevated noise levels compared to the No Action Alternative. Based on the cumulative and single event noise levels described above, there may be some temporary disturbance to recreational users or

individuals engaged in ranching and grazing in the Military Lease Area, but these effects would be limited in duration and scope. As described above, Range Control would restrict access to surface danger zones and other areas within the Military Lease Area as required to preserve safety. This would ensure the public would not be present in areas where sound levels would be potentially harmful to human hearing. Range Control would provide advance notice of training schedules to the public to make them aware of when and where noise from training may be heard. Therefore, training under Alternative 1 would result in less than significant impacts from ground and aviation training noise.

4.8.3.2 Construction

Short-term, moderate impacts on the noise environment would be anticipated from construction associated with Alternative 1, including vegetation trimming and clearing, grading and earthmoving, and construction of the Base Camp and other training infrastructure. New temporary sources of noise would be present at the different construction locations at varied periods throughout the entire construction phase, over a 10 to 15 year period. Projects would be constructed at different locations throughout the Military Lease Area. Construction would typically be limited to daytime hours (7 a.m. to 10 p.m.). This would result in a temporary increase in noise at the project site and surrounding area. For example, at 50 feet away, construction equipment can produce maximum sound levels between 70 and 95 decibels, but that dissipates to around 65 decibels at a distance of 300 feet and less than 65 decibels at 1,000 feet. There are no residences, schools, or churches located within the Military Lease Area that would be affected by construction noise; however, some cultural resources would experience temporary moderate impacts. As construction would be intermittent and temporary, occur only over small areas, only in the Military Lease Area, and would be managed by Range Control to minimize impacts to cultural resource sites, Alternative 1 construction would result in less than significant noise impacts.

4.8.4 Alternative 2

4.8.4.1 Training

Ground Training

Under Alternative 2, training would continue and would increase over the No Action Alternative by approximately 5 percent, which is approximately 10 percent less than Alternative 1. All training would occur within the Military Lease Area and impacts would be similar to those described for Alternative 1. The increased training tempo may result in additional days when noise from ground training (vehicle movements, live-fire range operations) may occur, but it would not expose new or different receptors to noise levels that are differ from what was described for Alternative 1.

Aircraft Training

Cumulative (Annual Average) Noise Impacts

TNI and Military Lease Area (North Field and Landing Zones). Under Alternative 2, no additional training flights are proposed to occur at TNI, and the baseline number of KC-135, F-18E/F, and F-35A/B/C at TNI would remain unchanged. There would be additional flights to TNI to deliver materials and equipment to support training, resulting in an increase of less than 1 percent of annual operations (from 29,207 to 29,238). The number of noise sensitive areas that would experience a day-night average sound level of 65 decibels would remain at zero due to

operations at TNI under Alternative 2. The change in Day-Night Average Sound Level solely related to the aircraft activity at TNI would be approximately 0.2 decibels relative to the No Action Alternative, which would be a less than significant noise impact.

While the tempo of training increases 5 percent over the No Action Alternative, the individual activities involving aircraft can have a range or aircraft types and flight times required to achieve the training objectives. Thus, military flight training in and around Tinian would increase for Alternative 2, as described in Chapter 2 and Appendix J. Similar to Alternative 1, approximately half of the annual flight time would occur at Landing Zones, North Field, within the airspace above the Military Lease Area or within 1 mile from shore. Training would involve the same aircraft types as Alternative 1: helicopters or tilt-rotorcraft (such as CH-53, AH-1, UH-1, and MV-22) flying approaches, hovering, and landing at the proposed Landing Zones, and helicopters, tilt-rotor aircraft, fixe d wing fighters (F-18E/F and F-35A/B/C) and tankers (KC-130) flying approaches to and takeoffs from the runways in North Field. Table 4.8-9 presents the noise levels at key sensitive receptors, which accounts for the change in aviation training in the Military Lease Area and the activity related to materials, equipment, and personnel transport to support training at TNI.

Table 4.8-9 Alternative 2 Aviation Training - Modeled Day-Night Average Noise Levels at Sensitive Receptors on Tinian

ID	*Description*	*Type*	*Alt 2 Noise Level – DNL (dB) / Change from Modeled Baseline*[1]
T2	Lake Hagoi	Natural Resource	67 / +23
T3	Mahalang Ephemeral Ponds	Natural Resource	57 / +17
T5	Mount Lasso Overlook Area	Natural Resource	52 / +7
T6	Bateha 1 – Isolated Wetlands	Natural Resource	48 / +2
T8	Bateha 2 – Isolated Wetlands	Natural Resource	47 / +3
T12	Unai Chiget	Cultural Resource	62 / +24
T13	Unai Chulu	Cultural Resource	73 / +31
T14	Unai Dankulo	Cultural Resource	49 / +3
T16	North Field National Historic Landmark	Cultural Resource	62 / +22
T20	Ushi Point	Natural Resource	59 / +15
T22	Unai Lam Lam	Cultural Resource	54 / +21
T25	Natural Resource Area	Natural Resource	54 / +12
T26	Unai Babui	Natural Resource	73 / +35

Legend: dB = decibels; DNL = day-night average noise level; ID = identification.

Notes: [1] Noise levels calculated based on aircraft activity that occurs at TNI and military aviation training throughout the Military Lease Area, including use of North Field and landing zones (Appendix J, *Noise Study*). Results presented here as exterior noise levels. Typical building construction results in a reduction of noise of level of 15 dB with windows open and 25 dB for windows closed (DoD Noise Working Group 2013).

Under Alternative 2 the training activity proposed at Landing Zones would result in similar impacts as described for Alternative 1, with the day-night average sound level contours of 65 decibels or greater centered at each location but generally limited to the boundary of the Landing Zone or the area immediately adjacent. The activity that would occur at North Field would result in noise contours that would extend both west and east along the heading of runway Baker primarily due to military jet operations that would perform arrival and departures. There are three locations that would have a day-night average sound level above 65 decibels: T2: Lake Hagoi,

T13: Unai Chulu, and T26: Unai Babui at 67, 73, and 73 decibels, respectively. These locations are just beyond the western edge of the North Field runways, and outdoor recreational activities at these day-night average sound level are generally still considered to be compatible. The remaining modeled operations that would be spread throughout the Military Lease Area and within 1 mile off-shore would produce day-night average sound levels between 40 to 55 decibels, which are considered compatible with all land uses. Therefore, changes to cumulative day-night average sound level would result in less than significant impacts to land use compatibility from aviation training noise under Alternative 2.

Single Event Noise Impacts

Under Alternative 2, the single event noise impacts would be similar to those described for Alternative 1. The sound exposure level and maximum sound levels would be the same as shown in Table 4.8-8. The number of flights would be less than under Alternative 1, with the flight speeds, altitudes, and areas where flights would occur would remain the same as under Alternative 1. Thus, aircraft training under Alternative 2 would be likely to produce annoyance and not expected to result in interruptions to conversations or indoor speech, or classroom learning on Tinian or Saipan. Figures 4.8-8 and Figure 4.8-9 depict the day-night average sound level contours for TNI and the Military Lease Area under Alternative 2, respectively. The full noise modeling results for proposed live-fire training can be found in Appendix J, Sections J.3.1.2 and J.3.2.1 Noise Exposure. Therefore, the single event noise levels from training under Alternative 2 would result in less than significant impacts.

In summary, training under Alternative 2 would result in similar impacts to those described for Alternative 1, with the primary difference being less flight activities, which would result in fewer, and still infrequent, single event noise levels that may produce annoyance related to aviation training. Therefore, training under Alternative 2 would result in less than significant impacts from noise.

Additional Noise Effects

Additional noise effects from training under Alternative 2 would result in the same conclusions as Alternative 1. There would not be a potential for hearing loss, increase to classroom disturbance, or increase in sleep disturbance. The primary difference for Alternative 2 would be less flight activities than Alternative 1, which would result in fewer, and still infrequent, single event noise levels that may produce annoyance related to aviation training.

4.8.4.2 Construction

Construction under Alternative 2 would be identical to Alternative 1, and therefore impacts would be the same as described for Alternative 1. Therefore, construction under Alternative 2 would result in less than significant noise impacts.

Figure 4.8-8 Day-Night Average Sound Level Contours (A-weighted Decibels) at TNI under Alternative 2

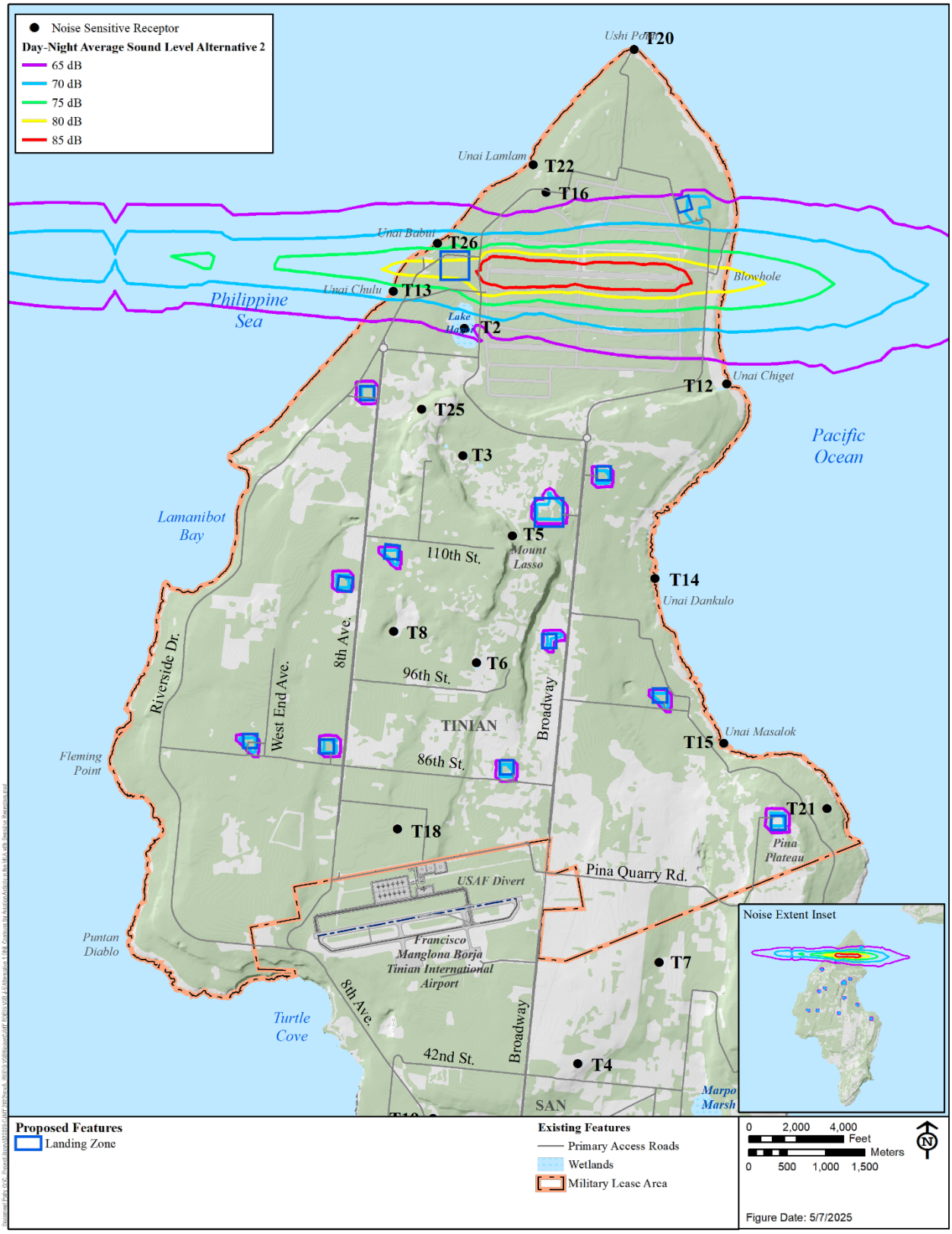


Figure 4.8-9 Day-Night Average Sound Level Contours (A-weighted Decibels) in Military Lease Area under Alternative 2

4.9 Air Quality

This section evaluates potential impacts to air quality and the contribution of greenhouse gas emissions that could result from implementing the Proposed Action. A region's air quality depends on many factors, including the type and amount of pollutants and how they are emitted into the atmosphere, the size and topography of the air basin, and the local meteorological conditions.

4.9.1 Approach to Analysis

This analysis estimated emissions associated with the alternatives and assessed the potential impacts of increased pollutant concentrations. It examines long-term increases in criteria pollutant and selected hazardous air pollutant emissions in relation to public proximity to the emissions, including sensitive populations, and prevailing wind patterns. These emissions were evaluated based on the location of emission sources, the magnitude of emissions, the frequency of occurrence, the location of sensitive receptors, and how and where the emissions would disperse based on local meteorology. Emission sources associated with the construction and operations of the Proposed Action include the following:

- Use of diesel- and gas-powered construction equipment
- Movement of trucks containing construction materials or removal of debris
- Commuting of construction workers
- Dust emissions from earth disturbance and travel on-road surfaces
- Vehicles used to travel throughout the Military Lease Area during training events and ground equipment used for training
- Fixed-wing and rotary-wing aircraft
- New stationary sources (e.g., emergency electrical power generators at the Base Camp, and a small incinerator for solid waste management)
- Live-fire training at Multi-Purpose Maneuver Range and Explosives Training Range (use of small caliber weapons and ordnance)

Appendix K describes in detail the emission estimation methodology used in this analysis. Emissions were evaluated based on whether they would occur on land or by aircraft over water, out to 3 nautical miles from shore within CNMI territorial seas, between 3 and 12 nautical miles from shore within U.S. territorial sea, and beyond 12 nautical miles from shore. Criteria pollutant and hazardous air pollutant emissions were limited to releases at or below 3,000 feet above ground level (U.S. EPA 1992). The 3,000-foot level serves as a common altitude cap for emissions that could impact ground level air quality, as emissions above this altitude are above the atmospheric inversion layer and have little interaction with the ground level. Greenhouse gas emissions were also estimated for aircraft operating above 3,000 feet.

The Proposed Action would involve live-fire from the Multi-Purpose Maneuver Range with 0.50 caliber ammunition and below, and from the Explosives Training Range, with a maximum of 40 pounds net explosive weight. Emissions from munitions and ordnance would be limited to the two live-fire range areas and consist of hazardous air pollutants such as acrolein, benzene, toluene, and particulate matter. The Agency for Toxic Substances and Disease Registry evaluated air emissions and their dispersion associated with munition constituents at active DoD ranges and munitions treatment sites (Agency for Toxic Substances and Disease Registry 2003a). In this study, the dispersion of air contaminants associated with weapons and ordnance use was found to be

primarily influenced by the prevailing wind direction, and the levels of various hazardous air pollutants measured were not at concentrations associated with adverse health effects. Additionally, measured particulate matter concentrations were significantly lower than applicable air quality standards (Agency for Toxic Substances and Disease Registry 2003b). Since the studies concluded there were no health hazards from weapons firing and ordnance use at active DoD ranges and the prevailing easterly trade winds transport emissions away from sensitive receptors on Tinian, a quantitative analysis of emissions associated with weapons firing and ordinance disposal was not conducted.

For construction, while emissions were quantified for CO, PM_{10}, and $PM_{2.5}$, a localized hot-spot analysis was not conducted as proposed construction-related activities that cause temporary increases in emissions would last 5 years or less at any individual site, per C.F.R. section 93.123(c)(5). As shown in Appendix K, while the proposed construction would last longer than 5 years, construction activities would not last longer than 5 years at any one location.

4.9.2 Emissions Calculations

Air pollutant emissions released during construction and training are evaluated for each alternative. Emission calculation details appear in Appendix K.

Construction emissions are calculated for on-road and non-road construction equipment, fugitive dust, on-road vehicles for construction worker commuting, and construction phasing. Construction is assumed to take place in phases over 10 to 15 years, with no individual project exceeding 5 years to construct. Estimates of the emissions from construction equipment were developed based on the anticipated types of equipment and levels of use, including the estimated hours of equipment use and appropriate emission factors for each type of equipment.

Emission factors for criteria pollutants, hazardous air pollutants, and greenhouse gases from both construction equipment and vehicles were derived from the most recent U.S. EPA's Motor Vehicle Emission Simulator Version 4.0 emission factor model (U.S. EPA 2023c), which is associated with the national default model database for both non-road equipment and on-road vehicle engines. The quantity and type of equipment and vehicle travel miles necessary were calculated from construction estimates for each project component. Because the Motor Vehicle Emission Simulator model does not contain data for the CNMI, the database for the U.S. Virgin Islands was used, based on a recommendation from the U.S. EPA (D. Brzezinski, Personal Communication, 2013). This database was selected due to the similar remote nature of the U.S. Virgin Islands compared to the CNMI. Selecting model input parameters available for a similar remote island for Tinian is considered reasonable, as standard control measures or population data inputs are limited compared to most states.

Training event emissions include those from on-road and off-road vehicles, aircraft, and stationary combustion sources, such as generators. Mobile vehicles associated with the various proposed training operations would generate fugitive dust emissions within areas of exposed soil. As with construction, emission factors for criteria pollutants, hazardous air pollutants, and greenhouse gases for mobile and non-road sources were derived from the U.S. EPA Motor Vehicle Emission Simulator Version 4.0 emission factor model. Particulate matter components in fugitive dust emissions from training vehicles maneuvering on unpaved roads were calculated using emission factors from the U.S. EPA guidance in AP-42, *Compilation of Air Pollutant Emissions Factors from Stationary Sources*. Stationary electrical generator emissions were calculated using factors

from U.S. EPA AP-42. Aircraft emissions were calculated using emission factors from the 2015 *MITT EIS/OEIS* and the 2020 *MITT Supplemental EIS/OEIS* (DON 2015b, 2020).

4.9.3 No Action Alternative

4.9.3.1 Criteria and Hazardous Air Pollutant Emissions

Under the No Action Alternative, ground and aviation training events would continue in the Military Lease Area with the same type of activities and at the same tempo as described in previous NEPA documents (DON 2010a, 2015b). In addition, all actions related to the U.S. Air Force Divert project (U.S. Air Force 2016, 2020) would be implemented. No change would occur under the No Action Alternative; therefore, there would be no change in impact on air quality.

Training event criteria pollutant and hazardous air pollutant emissions associated with the No Action Alternative, which were calculated following the methodology described above, are outlined in Table 4.9-1. Only those emissions sources that would also be included within the alternatives were considered (i.e., existing marine surface vessels were excluded for comparison purposes).

Table 4.9-1 No Action Alternative Criteria Pollutant and Hazardous Air Pollutant Emissions from Training Events

Location/Source	*Annual Emissions (Tons)*						
	CO	***NO_x***	***VOC***	***SO_x***	***PM_{10}***	***$PM_{2.5}$***	***Total HAPs[1]***
State (0-3 nm offshore) [< 3,000 ft altitude]							
On-road Vehicles[2]	5.442	0.156	0.178	0.002	0.040	0.009	0.046
Nonroad Vehicles and Equipment[2]	2.429	10.148	0.825	0.029	0.517	0.502	0.332
Aircraft	194.572	226.016	27.525	16.270	60.151	54.148	7.848
Fugitive Road Dust	--	--	--	--	1,429.688	145.281	--
Total	**202.443**	**236.320**	**28.528**	**16.301**	**1490.396**	**199.940**	**8.226**
Waters of U.S. (3-12 nm offshore) [< 3,000 ft altitude]							
Aircraft	10.747	17.617	1.584	0.834	4.091	3.686	0.452
Total	**10.747**	**17.617**	**1.584**	**0.834**	**4.091**	**3.686**	**0.452**
High Seas (>12 nm offshore) [< 3,000 ft altitude]							
Aircraft	0.913	20.505	0.123	0.606	5.656	5.090	0.035
Total	**0.913**	**20.505**	**0.123**	**0.606**	**5.656**	**5.090**	**0.035**
Combined No Action Alternative Total	**214.103**	**274.441**	**30.235**	**17.741**	**1500.143**	**208.716**	**8.713**

Legend: < = less than; > = greater than; CO = carbon monoxide; ft = feet; HAP = hazardous air pollutant; nm = nautical miles; NO_x = nitrogen oxides; PM_{10} = particles with aerodynamic diameters less than or equal to a nominal 10 micrometers; $PM_{2.5}$ = particles with aerodynamic diameters less than or equal to a nominal 2.5 micrometers; SO_x = sulfur oxides; U.S. = United States; VOC = volatile organic compound.

Notes: [1] HAPs include acetaldehyde, acrolein, benzene, 1,3-butadiene, ethylbenzene, formaldehyde, isopropyl-benzene, methanol, 1-methylnaphthalene, 2-methylnaphthalene, naphthalene, phenol, propionaldehyde, styrene, toluene, xylene, and hexane.

[2] Mobile sources include a wide variety of vehicles, engines, and equipment. "On-road" or highway sources include vehicles used on roads for transportation of passengers or freight. "Nonroad" (also sometimes referred to as "off-road") sources include vehicles, engines, and equipment used for construction, military training, and many other purposes. Refer to Appendix K, *Air Quality Emissions Calculations*, for more information on the on-road and non-road sources.

4.9.3.2 Greenhouse Gas Emissions

The estimated greenhouse gas emissions under the No Action Alternative are presented in Table 4.9-2.

Table 4.9-2 No Action Alternative Greenhouse Gas Annual Emissions

Location/Source	*Annual Emissions – Metric Tons*			
	CO_2	*CH_4*	*N_2O*	*CO_2e*
State (0-3 nm offshore) [< 3,000 ft altitude]				
On-road Vehicles	433.360	0.019	0.007	435.970
Off-road Vehicles and Equipment	9,537.226	0.035	0.016	9,542.897
Aircraft	109,234.569	4.588	0.896	109,616.186
Total	**119,205.155**	**4.642**	**0.919**	**119,595.053**
Waters of U.S. (3-12 nm offshore) [< 3,000 ft altitude]				
Aircraft	10,406.566	0.435	0.085	10,442.857
Total	**10,406.566**	**0.435**	**0.085**	**10,442.857**
High Seas (>12 nm offshore) [< 3,000 ft altitude]				
Aircraft	6,614.155	0.269	0.054	6,636.910
Total	**6,614.155**	**0.269**	**0.054**	**6,636.910**
> 3,000 ft Altitude				
Aircraft	458,898.685	19.148	3.759	460,497.556
Total	**458,898.685**	**19.148**	**3.759**	**460,497.556**
Combined No Action Alternative Total	**595,124.561**	**24.494**	**4.817**	**597,172.376**

Legend: < = less than; > = greater than; CH_4 = methane; CO_2 = carbon dioxide; CO_2e = carbon dioxide equivalent; ft = feet; N_2O = nitrous oxide; nm = nautical miles; U.S. = United States.

4.9.4 Alternative 1

4.9.4.1 Criteria and Hazardous Air Pollutant Emissions

Construction and training event air emissions for both criteria pollutants and hazardous air pollutants associated with Alternative 1 are presented in Table 4.9-3 through Table 4.9-6. Table 4.9-5 presents emissions that would be generated from stationary sources that are permitted to operate without an air permit. The potential use of a small diesel-powered solid waste incinerator at the Base Camp is an example of a permitted source. The emission limits (or caps) for this small incinerator are conservatively assumed in the emission analysis. Other minor stationary source equipment includes diesel-powered standby generators used only during power outages at the Base Camp, surface radar sites, and radio communications towers. Emissions from these generators would be intermittent; 500 operational hours per year are assumed for each generator. The maximum construction year provided in Table 4.9-6 represents the maximum annual emissions for each pollutant over any of the construction years.

Table 4.9-3 Alternative 1 Criteria Pollutant and Hazardous Air Pollutant Emissions from Training Events

Location/Source	*Annual Emissions (Tons)*						
	CO	*NO_x*	*VOC*	*SO_x*	*PM_{10}*	*$PM_{2.5}$*	*Total HAPs*[1]
State (0-3 nm offshore) [< 3,000 ft altitude]							
On-road Vehicles[2]	6.400	0.184	0.210	0.003	0.047	0.011	0.054
Nonroad Vehicles and Equipment[2]	4.282	18.029	1.432	0.058	0.906	0.879	0.569

Location/Source	Annual Emissions (Tons)						
	CO	NO_x	VOC	SO_x	PM_{10}	$PM_{2.5}$	Total HAPs[1]
Aircraft	330.254	348.666	46.358	23.319	104.995	94.508	13.218
Fugitive Road Dust	--	--	--	--	3,145.767	316.889	--
Total	**340.937**	**366.880**	**48.000**	**23.379**	**3,251.715**	**412.286**	**13.841**
Waters of U.S. (3-12 nm offshore) [< 3,000 ft altitude]							
Aircraft	33.595	39.735	5.075	1.931	12.843	11.563	0.885
Total	**33.595**	**39.735**	**5.075**	**1.931**	**12.843**	**11.563**	**0.885**
High Seas (>12 nm offshore) [< 3,000 ft altitude]							
Aircraft	2.248	51.008	0.277	1.353	14.725	13.253	0.042
Total	**2.248**	**51.008**	**0.277**	**1.353**	**14.725**	**13.253**	**0.042**
Combined Alternative 1 Total	**376.780**	**457.623**	**53.352**	**26.663**	**3,279.283**	**437.102**	**14.768**

Legend: CO = carbon monoxide; ft = feet; HAP = hazardous air pollutant; nm = nautical miles; NO_x = nitrogen oxides; PM_{10} = particles with aerodynamic diameters less than or equal to a nominal 10 micrometers; $PM_{2.5}$ = particles with aerodynamic diameters less than or equal to a nominal 2.5 micrometers; SO_x = sulfur oxides; U.S. = United States; VOC = volatile organic compound.

Notes: [1] HAPs include acetaldehyde, acrolein, benzene, 1,3-butadiene, ethylbenzene, formaldehyde, isopropyl-benzene, methanol, 1-methylnaphthalene, 2-methylnaphthalene, naphthalene, phenol, propionaldehyde, styrene, toluene, xylene, and hexane.

[2] Mobile sources include a wide variety of vehicles, engines, and equipment. "On-road" or highway sources include vehicles used on roads for transportation of passengers or freight. "Nonroad" (also sometimes referred to as "off-road") sources include vehicles, engines, and equipment used for construction, military training, and many other purposes. Refer to Appendix K, *Air Quality Emissions Calculations*, for more information on the on-road and non-road sources.

Table 4.9-4 Alternative 1 Criteria Pollutant and Hazardous Air Pollutant Emissions from Construction

Location/Source	Annual Emissions (Tons)						
	CO	NOx	VOC	SOx	PM10	PM2.5	Total HAPs[1]
State (0-3 nm offshore) [< 3,000 ft altitude]							
2026	2.741	0.106	0.408	0.001	0.047	0.042	0.137
2027	2.741	0.106	0.408	0.001	0.047	0.042	0.137
2028	4.752	0.639	0.238	0.003	0.082	0.040	0.079
2030	2.873	0.470	0.404	0.001	0.064	0.057	0.138
2031	0.726	0.504	0.077	0.001	0.033	0.028	0.030
2033	0.475	0.385	0.031	0.001	3.093	0.321	0.013
2036	0.048	0.073	0.005	0.000	0.494	0.052	0.002
2038	0.028	0.014	0.004	0.000	3.077	0.309	0.001
2039	0.028	0.014	0.004	0.000	3.077	0.309	0.001
Combined Alternative 1 Total	**14.413**	**2.310**	**1.578**	**0.008**	**10.013**	**1.201**	**0.539**

Legend: < = less than; CO = carbon monoxide; ft = feet; HAP = hazardous air pollutant; nm = nautical miles; NO_x = nitrogen oxides; PM_{10} = particles with aerodynamic diameters less than or equal to a nominal 10 micrometers; $PM_{2.5}$ = particles with aerodynamic diameters less than or equal to a nominal 2.5 micrometers; SO_x = sulfur oxides; U.S. = United States; VOC = volatile organic compound.

Note: [1] HAPs include acetaldehyde, acrolein, benzene, 1,3-butadiene, ethylbenzene, formaldehyde, isopropyl-benzene, methanol, 1-methylnaphthalene, 2-methylnaphthalene, naphthalene, phenol, propionaldehyde, styrene, toluene, xylene, and hexane.

Table 4.9-5 Alternative 1 Criteria Pollutant and Hazardous Air Pollutant Emissions from Stationary Sources

Location/Source	Annual Emissions (Tons)						
	CO	NO_x	VOC	SO_x	PM_{10}	$PM_{2.5}$	Total HAPs[1]
State (0-3 nm offshore) [< 3,000 ft altitude]							
Emergency Generators[2]	2.866	2.772	0.395	0.006	0.176	0.171	0.005
Solid Waste Incinerator (permitted thresholds)[3]	<1	<1	<1	<1	<1	<1	<0.1
Combined Alternative 1 Total	**<3.866**	**<3.772**	**<1.395**	**<1.006**	**<1.176**	**<1.171**	**<0.105**

Legend: < = less than; CO = carbon monoxide; ft = feet; HAP = hazardous air pollutant; nm = nautical miles; NO_x = nitrogen oxides; PM_{10} = particles with aerodynamic diameters less than or equal to a nominal 10 micrometers; $PM_{2.5}$ = particles with aerodynamic diameters less than or equal to a nominal 2.5 micrometers; SO_x = sulfur oxides; U.S. = United States; VOC = volatile organic compound.

Notes: [1] HAPs include acetaldehyde, acrolein, benzene, 1,3-butadiene, ethylbenzene, formaldehyde, isopropyl-benzene, methanol, 1-methylnaphthalene, 2-methylnaphthalene, naphthalene, phenol, propionaldehyde, styrene, toluene, xylene, and hexane.

[2] Includes six 200-kilowatt diesel-powered emergency generators and two 50-kilowatt diesel-powered emergency generators operating up to 500 hours per year.

[3] Permitted stationary minor source limits per Northern Mariana Islands Administrative Code section 65-10, Air Pollution Control Regulations section 65-10-303(e)(1) for potential operation of a small solid waste incinerator to reduce the volume of training waste at Base Camp.

Table 4.9-6 Alternative 1 Criteria Pollutant and Hazardous Air Pollutant Annual Emissions (Maximum Construction Year and Training Events Occurring Concurrently)

Location/Source	Annual Emissions (Tons)						
	CO	NO_x	VOC	SO_x	PM_{10}	$PM_{2.5}$	Total HAPs[1]
State (0-3 nm offshore) [< 3,000 ft altitude]							
On-road Vehicles[2]	6.400	0.184	0.210	0.003	0.047	0.011	0.054
Nonroad Vehicles and Equipment[2]	4.282	18.029	1.432	0.058	0.906	0.879	0.569
Aircraft	330.254	348.666	46.358	23.319	104.995	94.508	13.218
Fugitive Road Dust	--	--	--	--	3,145.77	316.89	--
Stationary Sources	3.866	3.772	1.395	1.006	1.176	1.171	0.105
Maximum Construction Year	4.752	0.639	0.408	0.003	3.093	0.321	0.138
Total	**349.555**	**371.290**	**49.802**	**24.388**	**3255.985**	**413.778**	**14.085**
Waters of U.S. (3-12 nm offshore) [< 3,000 ft altitude]							
Aircraft	33.595	39.735	5.075	1.931	12.843	11.563	0.885
Total	**33.595**	**39.735**	**5.075**	**1.931**	**12.843**	**11.563**	**0.885**
High Seas (>12 nm offshore) [< 3,000 ft altitude]							
Aircraft	2.248	51.008	0.277	1.353	14.725	13.253	0.042
Total	**2.248**	**51.008**	**0.277**	**1.353**	**14.725**	**13.253**	**0.042**
Combined Alternative 1 + Construction Total	**385.398**	**462.034**	**55.155**	**27.672**	**3283.553**	**438.594**	**15.011**
Increase from No Action Alternative	**171.295**	**187.592**	**24.920**	**9.931**	**1783.410**	**229.878**	**6.298**

Legend: CO = carbon monoxide; ft = feet; HAP = hazardous air pollutant; nm = nautical miles; NO_x = nitrogen oxides; PM_{10} = particles with aerodynamic diameters less than or equal to a nominal 10 micrometers; $PM_{2.5}$ = particles with

aerodynamic diameters less than or equal to a nominal 2.5 micrometers; SO_x = sulfur oxides; U.S. = United States; VOC = volatile organic compound.

Notes: [1] HAPs include acetaldehyde, acrolein, benzene, 1,3-butadiene, ethylbenzene, formaldehyde, isopropyl-benzene, methanol, 1-methylnaphthalene, 2-methylnaphthalene, naphthalene, phenol, propionaldehyde, styrene, toluene, xylene, and hexane.

[2] Mobile sources include a wide variety of vehicles, engines, and equipment. "On-road" or highway sources include vehicles used on roads for transportation of passengers or freight. "Nonroad" (also sometimes referred to as "off-road") sources include vehicles, engines, and equipment used for construction, military training, and many other purposes. Refer to Appendix K, *Air Quality Emissions Calculations*, for more information on the on-road and non-road sources.

Criteria air pollutant and hazardous air pollutant emissions from construction activities and training activities associated with Alternative 1 would have a less than significant impact on the air quality on Tinian due to the following:

- Construction emissions would be temporary, and fugitive dust control measures would be implemented where practical and in accordance with the Northern Mariana Islands Administrative Code, section 65-10-103, Fugitive dust.
- Emissions produced by construction, training, and operational activities would predominantly occur within the Military Lease Area and would not be in proximity to sensitive receptors (i.e., residences, schools). The closest sensitive receptor is the Marpo Heights residential area which is located at a distance of 2,000 feet from the Military Lease Area boundary.
- Operational emissions include permitted and exempt (minor activity) stationary source equipment used at the Base Camp or within the Military Lease Area training areas. The permitted stationary source equipment would be a diesel-powered solid waste incinerator, if that option is pursued, to manage training-generated solid waste. Exempt stationary source equipment would primarily be smaller equipment such as water heaters or standby emergency generators for the Base Camp, surface radar sites, and radio communications towers used only during power outages. All new permitted stationary sources would be evaluated and permitted as appropriate through the CNMI Bureau of Environmental and Coastal Quality. Stationary sources would be subject to emissions limits and control measures as applicable, per the Northern Mariana Islands Administrative Code, section 65-10, Air Pollution Control Regulations, and any specific conditions developed as part of the permitting process.
- Residents and visitors would be temporarily restricted from accessing areas immediately adjacent to or within a certain distance from where certain training activities occur within the Military Lease Area, such as aircraft activity or use of the live-fire ranges, which would minimize long-term exposure to operational emissions.
- Emissions from aircraft, which account for the majority of emissions during training events, excluding fugitive dust, would be released primarily at higher altitudes, increasing the dispersion of these emissions before they reach ground level, which decreases the concentration of criteria and hazardous air pollutants at any specific location.
- On-road emissions would be expected to occur primarily within the Military Lease Area. Outside the Military Lease Area, emissions would occur from transportation of service members and equipment or materials to be used during training from TNI or the Port of Tinian to training areas within the Military Lease Area. This would include a total of 50 individual bus trips on local roadways from TNI to and from the Military Lease Area in

the days preceding and following a large-scale training event. The maximum daily traffic under Alternative 1, including existing traffic volume along the most heavily trafficked street on Tinian outside of the Military Lease Area, is about 2,500 vehicles per day. Because there are no monitoring stations on Tinian or in CNMI, average daily traffic counts around air monitoring stations in Honolulu, Kapolei and Pearl City, Hawaii were used as a reference. Applying this methodology, even with an overly-conservative assumption that trips outside the Military Lease Area could occur on a daily basis, the total vehicle trips per day remain well below any actionable air levels.

- Hazardous air pollutant emissions per year are below the Clean Air Act major source thresholds of a combined total of 25 tons per year.

4.9.4.2 Greenhouse Gas Emissions

Alternative 1 would generate an increase in greenhouse gas emissions during both construction and training events as compared to the No Action Alternative. These emissions, along with the net increase are presented in Table 4.9-7.

Table 4.9-7 Alternative 1 Greenhouse Gas Annual Emissions (Maximum Construction Year and Training Events Occurring Concurrently)

Location/Source	*Annual Emissions – Metric Tons*			
	CO_2	*CH_4*	*N_2O*	*CO_2e*
State (0-3 nm offshore) [< 3,000 ft altitude]				
On-road Vehicles	509.674	0.022	0.008	512.743
Off-road Vehicles and Equipment	19,317.797	0.061	0.028	19,327.627
Aircraft	175,819.613	7.378	1.442	176,433.673
Stationary Sources	544.912	0.022	0.004	546.782
Maximum Construction Year	865.570	0.018	0.018	871.386
Total	**197057.565**	**7.502**	**1.500**	**197692.211**
Waters of U.S. (3-12 nm offshore) [< 3,000 ft altitude]				
Aircraft	22,191.385	0.924	0.182	22,268.684
Total	**22,191.385**	**0.924**	**0.182**	**22,268.684**
High Seas (>12 nm offshore) [< 3,000 ft altitude]				
Aircraft	16,789.143	0.681	0.137	16,846.879
Total	**16,789.143**	**0.681**	**0.137**	**16,846.879**
> 3,000 ft Altitude				
Aircraft	620,318.869	25.666	5.074	622,472.617
Total	**620,318.869**	**25.666**	**5.074**	**622,472.617**
Combined Alternative 1 + Construction Total	**856,356.963**	**34.774**	**6.893**	**859,280.390**
Increase from No Action Alternative	**261,232.402**	**10.280**	**2.076**	**262,108.014**

Legend: > = greater than; CH_4 = methane; CO_2 = carbon dioxide; CO_2e = carbon dioxide equivalent; ft = feet; N_2O = nitrous oxide; nm = nautical miles; U.S. = United States.

Greenhouse gas emissions generated from training and construction under Alternative 1 would contribute to the global atmosphere, regardless of their specific location of production. The net changes in greenhouse gas emissions resulting from Alternative 1, compared to the No Action Alternative, would increase CO_2e emissions within both the CNMI and the U.S. territories by the

percentages shown in Table 4.9-8, based on the most recent available greenhouse gas emissions inventories including the CNMI inventory from only partial sectors.

Table 4.9-8 Net Increase in Greenhouse Gas Emissions from Proposed Action as Compared to CNMI and U.S. Territory Greenhouse Gas Emissions Inventories

2023 CNMI Priority Sector GHG Inventory (Metric Tons of CO2e)	*2021 U.S. Territories[1] GHG Inventory (Metric Tons of CO2e)*	*Net Increase under Alternative 1*	*Net Increase under Alternative 2*
443,167	33,305,000	262,108	61,358
Percentage of 2023 CNMI Priority Sector Inventory		59.1	13.8
Percentage of 2021 U.S. Territories Inventory		0.8	0.2

Notes: [1] U.S. Territories (American Samoa, Guam, Hawaii, Northern Marianas Islands, U.S. Virgin Islands, and Puerto Rico) are included U.S. National Greenhouse Gas Inventory. The total land area of all U.S. Territories is 1.05 million hectares, representing 0.1 percent of the total land base for the U.S.

Legend: CNMI = Commonwealth of the Northern Mariana Islands; CO_2e = carbon dioxide equivalent; GHG = greenhouse gas; U.S. = United States.

Source: CNMI Climate Planning and Policy Program 2024; U.S. Environmental Protection Agency 2024.

The net changes in greenhouse gas emissions resulting from Alternative 1 were also compared to equivalencies to help contextualize the emissions in more familiar terms, such as annual household emissions, average emissions from a certain number of vehicles on the road, or the quantity of fuel burned. Based on the difference between the greenhouse gas emission results of the No Action and Alternative 1 (Table 4.9-7), equivalency values (i.e., increases) were derived using U.S. EPA's Greenhouse Gas Equivalencies Calculator (U.S. EPA 2024) and are summarized in Table 4.9-9.

Table 4.9-9 Equivalency Examples for Maximum Net Annual Increases of Greenhouse Gas Emissions from Proposed Alternatives

Equivalent Source	*Alternative 1*	*Alternative 2*
Barrels of crude oil consumed	606,835	142,057
Gasoline powered passenger vehicles driven for one year	61,138	14,312
Tanker truck's-worth of gasoline	3,470	812
Natural gas-fired power plant in one year	0.686	0.16

Implementation of Alternative 1 would contribute directly to emissions of greenhouse gases from the combustion of fossil fuels during construction and training predominantly from mobile source combustion when training occurs. Compared to the No Action Alternative in future years, Alternative 1 would result in increased greenhouse gas emissions that could affect the CNMI's efforts to achieve its long-term greenhouse gas emission reduction goals. However, the effect from change in greenhouse gas emissions should be evaluated on a global scale as all cumulative emissions contribute to the overall atmospheric greenhouse gas burden. Alternative 1 would only result in a small percentage of total greenhouse gas emissions in the U.S. Therefore, the greenhouse gas emissions from Alternative 1 should have a less than significant impact even though there is no single, universally accepted greenhouse gas emissions threshold for significance.

4.9.5 Alternative 2

4.9.5.1 Criteria and Hazardous Air Pollutant Emissions

Construction and training event criteria and hazardous air pollutant emissions associated with Alternative 2 are outlined in Table 4.9-10 and Table 4.9-11. The emissions from construction and stationary sources would be the same as shown for Alternative 1 (Tables 4.9-4 and 4.9-5). As with Alternative 1, the maximum construction year provided in Table 4.9-11 represents the maximum annual emissions for each pollutant over any of the construction years.

Table 4.9-10 Alternative 2 Criteria Pollutant and Hazardous Air Pollutant Emissions from Training Events

Location/Source	*Annual Emissions (Tons)*						
	CO	*NO_x*	*VOC*	*SO_x*	*PM_{10}*	*$PM_{2.5}$*	*Total HAPs*[1]
State (0-3 nm offshore) [< 3,000 ft altitude]							
On-road Vehicles[2]	6.400	0.184	0.210	0.003	0.047	0.011	0.054
Non-road Vehicles and Equipment[2]	2.907	12.239	0.976	0.039	0.617	0.598	0.388
Aircraft	231.904	262.771	32.528	18.377	73.632	66.281	9.275
Fugitive Road Dust	--	--	--	--	2,100.03	212.32	--
Total	**241.212**	**275.195**	**33.714**	**18.419**	**2,174.323**	**279.205**	**9.717**
Waters of U.S. (3-12 nm offshore) [< 3,000 ft altitude]							
Aircraft	20.627	25.261	3.104	1.253	7.219	6.501	0.885
Total	**20.627**	**25.261**	**3.104**	**1.253**	**7.219**	**6.501**	**0.885**
High Seas (>12 nm offshore) [< 3,000 ft altitude]							
Aircraft	1.121	25.253	0.146	0.720	7.078	6.370	0.042
Total	**1.121**	**25.253**	**0.146**	**0.720**	**7.078**	**6.370**	**0.042**
Combined Alternative 2 Total	**262.959**	**325.709**	**36.964**	**20.391**	**2,188.620**	**292.076**	**10.644**

Legend: < = less than; > = greater than; CO = carbon monoxide; ft = feet; HAP = hazardous air pollutant; nm = nautical miles; NO_x = nitrogen oxides; PM_{10} = particles with aerodynamic diameters less than or equal to a nominal 10 micrometers; $PM_{2.5}$ = particles with aerodynamic diameters less than or equal to a nominal 2.5 micrometers; SO_x = sulfur oxides; U.S. = United States; VOC = volatile organic compound.

Notes: [1] HAPs include acetaldehyde, acrolein, benzene, 1,3-butadiene, ethylbenzene, formaldehyde, isopropyl-benzene, methanol, 1-methylnaphthalene, 2-methylnaphthalene, naphthalene, phenol, propionaldehyde, styrene, toluene, xylene, and hexane.

[2] Mobile sources include a wide variety of vehicles, engines, and equipment. "On-road" or highway sources include vehicles used on roads for transportation of passengers or freight. "Nonroad" (also sometimes referred to as "off-road") sources include vehicles, engines, and equipment used for construction, military training, and many other purposes. Refer to Appendix K, *Air Quality Emissions Calculations*, for more information on the on-road and non-road sources. On-road vehicle emissions are assumed to be the same compared to Alternative 1 as the change in vehicle trips would be too small to be measurable.

Table 4.9-11 Alternative 2 Criteria Pollutant and Hazardous Air Pollutant Annual Emissions (Maximum Construction Year and Training Events Occurring Concurrently)

Location/Source	*Annual Emissions (Tons)*						
	CO	*NO_x*	*VOC*	*SO_x*	*PM_{10}*	*$PM_{2.5}$*	*Total HAPs*[1]
State (0-3 nm offshore) [< 3,000 ft altitude]							
On-road Vehicles[2]	6.400	0.184	0.210	0.003	0.047	0.011	0.054
Nonroad Vehicles and Equipment[2]	2.907	12.239	0.976	0.039	0.617	0.598	0.388

Location/Source	Annual Emissions (Tons)						
	CO	NO_x	VOC	SO_x	PM_{10}	$PM_{2.5}$	Total HAPs[1]
Aircraft	231.904	262.771	32.528	18.377	73.632	66.281	9.275
Fugitive Road Dust	--	--	--	--	2,100.03	212.32	--
Stationary Sources	3.866	3.772	1.395	1.006	1.176	1.171	0.105
Maximum Construction Year	4.752	0.639	0.408	0.003	3.093	0.321	0.138
Total	**249.830**	**279.605**	**35.517**	**19.428**	**2,178.593**	**280.697**	**9.961**
Waters of U.S. (3-12 nm offshore) [< 3,000 ft altitude]							
Aircraft	20.627	25.261	3.104	1.253	7.219	6.501	0.885
Total	**20.627**	**25.261**	**3.104**	**1.253**	**7.219**	**6.501**	**0.885**
High Seas (>12 nm offshore) [< 3,000 ft altitude]							
Aircraft	1.121	25.253	0.146	0.720	7.078	6.370	0.042
Total	**1.121**	**25.253**	**0.146**	**0.720**	**7.078**	**6.370**	**0.042**
Combined Alternative 2 + Construction Total	**271.577**	**330.119**	**38.767**	**21.401**	**2192.889**	**293.568**	**10.887**
Increase from No Action Alternative	**57.474**	**55.678**	**8.532**	**3.660**	**692.746**	**84.852**	**2.174**

Legend: CO = carbon monoxide; ft = feet; HAP = hazardous air pollutant; nm = nautical miles; NO_x = nitrogen oxides; PM_{10} = particles with aerodynamic diameters less than or equal to a nominal 10 micrometers; $PM_{2.5}$ = particles with aerodynamic diameters less than or equal to a nominal 2.5 micrometers; SO_x = sulfur oxides; U.S. = United States; VOC = volatile organic compound.

Notes: [1] HAPs include acetaldehyde, acrolein, benzene, 1,3-butadiene, ethylbenzene, formaldehyde, isopropyl-benzene, methanol, 1-methylnaphthalene, 2-methylnaphthalene, naphthalene, phenol, propionaldehyde, styrene, toluene, xylene, and hexane.

[2] Mobile sources include a wide variety of vehicles, engines, and equipment. "On-road" or highway sources include vehicles used on roads for transportation of passengers or freight. "Nonroad" (also sometimes referred to as "off-road") sources include vehicles, engines, and equipment used for construction, military training, and many other purposes. Refer to Appendix K, *Air Quality Emissions Calculations*, for more information on the on-road and non-road sources. On-road vehicle emissions are assumed to be the same compared to Alternative 1 as the change in vehicle trips would be too small to be measurable

Criteria air pollutant and hazardous air pollutant emissions from construction activities and training activities associated with Alternative 2 would have a less than significant impact on the air quality on Tinian for the same reasons as outlined for Alternative 1.

4.9.5.2 Greenhouse Gas Emissions

Alternative 2 would also generate an increase in greenhouse gas emissions during both construction and training events as compared to the No Action Alternative. These emissions, along with the net increase are presented in Table 4.9-12. However, the increase in greenhouse gas emissions would be much less compared to Alternative 1, as presented in Table 4.9-7.

The net changes in greenhouse gas emissions from Alternative 2, compared to the No Action Alternative, would increase CO_2e emissions within both the CNMI and the U.S. territories by the percentages shown in Table 4.9-10.

The net changes in greenhouse gas emissions resulting from Alternative 2 were also compared to equivalencies, such as annual household emissions, average emissions from a certain number of vehicles on the road, or the quantity of fuel burned that are summarized in Table 4.9-11. The changes in greenhouse gas emissions from Alternative 2 would only result in a small percentage

of total greenhouse gas emissions in the U.S. Therefore, the greenhouse gas emissions from Alternative 2 should have a less than significant impact.

Table 4.9-12 Alternative 2 Greenhouse Gas Annual Emissions (Maximum Construction Year and Training Events Occurring Concurrently)

Location/Source	*Annual Emissions – Metric Tons*			
	CO_2	*CH_4*	*N_2O*	*CO_2e*
State (0-3 nm offshore) [< 3,000 ft altitude]				
On-road Vehicles	509.674	0.022	0.008	512.743
Off-road Vehicles and Equipment	13,047.661	0.042	0.019	13,054.355
Aircraft	128,374.929	5.390	1.053	128,823.380
Stationary Sources	544.912	0.022	0.004	546.782
Maximum Construction Year	865.570	0.018	0.018	871.386
Total	**143342.746**	**5.495**	**1.102**	**143808.646**
Waters of U.S. (3-12 nm offshore) [< 3,000 ft altitude]				
Aircraft	14,919.438	0.623	0.122	14,971.456
Total	**14,919.438**	**0.623**	**0.122**	**14,971.456**
High Seas (>12 nm offshore) [< 3,000 ft altitude]				
Aircraft	8,203.306	0.333	0.067	8,231.524
Total	**8,203.306**	**0.333**	**0.067**	**8,231.524**
> 3,000 ft Altitude				
Aircraft	489,813.914	20.393	4.011	491,519.058
Total	**489,813.914**	**20.393**	**4.011**	**491,519.058**
Combined Alternative 2 + Construction Total	**656,279.403**	**26.844**	**5.303**	**658,530.683**
Increase from No Action Alternative	**61,154.843**	**2.350**	**0.486**	**61,358.307**

Legend: < = less than; > = greater than; CH_4 = methane; CO_2 = carbon dioxide; CO_2e = carbon dioxide equivalent; ft = feet; N_2O = nitrous oxide; nm = nautical miles; U.S. = United States.

4.10 Public Health and Safety

4.10.1 Approach to Analysis

The analysis focuses on the Proposed Action's potential impacts on Tinian to public health and safety from ground training, aviation training and civilian aviation, radio frequency and microwave emissions, natural hazards, construction, and protection of children from environmental health and safety risks. For each of these categories, the subsections below evaluate potential impacts relative to the existing conditions described in Section 3.10, taking into account regulatory standards, established safety protocols, and best management practices as applicable.

The Proposed Action also includes the establishment of a new lease and the reuse of existing facilities, including up to four communication towers at the former USAGM site on Saipan. However, no military training is proposed to occur on Saipan, and public access to the site would remain restricted. Therefore, no impacts to public health and safety are anticipated in association with the Saipan site.

4.10.2 No Action Alternative

Under the No Action Alternative, ground and aviation training events would continue on Tinian with the same or similar types of activities and tempo as described in previous NEPA documents

(DON 2010, 2015). The existing environment also includes completed improvements associated with the U.S. Air Force Divert project (U.S. Air Force 2016, 2020). Additionally, projects under the Air Force's Agile Combat Employment program would proceed, including vegetation clearance and restoration of the runway and other engineered surfaces at North Field, which would improve roadways used for public access and benefit public health and safety. Military training within the Military Lease Area would continue under existing standard operating procedures that ensure public safety. Therefore, no changes or impacts to public health and safety would occur under the No Action Alternative.

4.10.3 Alternative 1

4.10.3.1 Ground Training

Under Alternative 1, the tempo of training would increase by approximately 15 percent over the No Action Alternative. As described in Section 3.10, the military employs a proactive and comprehensive program to ensure the safety and health of training personnel and the public who may frequent the Military Lease Area. Range Control would be responsible for ensuring training units follow all federal and local laws and regulations and military guidance, policies, and procedures. Environmental risks associated with live-fire training activities potentially include soil contamination from munitions residues and water contamination from hazardous materials. Lead is also the primary contaminant of concern for the Multi-Purpose Maneuver Range, along with the disposition of small amounts of munitions constituents from ordnance use at both live-fire ranges. Munitions constituents in partially or unexploded ordnance are contained within the munition itself, and thus release of munitions constituents due to corrosion of the casing may take a long time to occur, although salt spray and humidity may accelerate deterioration of the casing. However, lead has low mobility and extremely high soil affinity as the primary condition that would influence the movement or mobility of lead in an environment is the pH of the soil.

The geology of Tinian is predominantly karst, and the soils are derived from limestone bedrock with abundant carbonates and are naturally neutral (pH 6.5–7.0) to alkaline (greater than 7.0). At neutral pH, heavy metals, like lead, become relatively insoluble and the potential for lead to be transported to the groundwater or in surface water runoff would be very low (Weil and Brady 2017) with the soil further acting as a filter for particulate lead (DON 2016).

Therefore, the potential for significant contamination of groundwater is low, and impacts associated with munitions constituents in soil and water would be less than significant with implementation of standard range management practices and monitoring. Range Control would enforce range clearance procedures to ensure hazardous materials are removed and to ensure the long-term safety and sustainability of the live-fire ranges. At the conclusion of training, units are required to conduct an initial sweep to clear training-related debris, including spent brass, target remnants, and packaging waste, restoring the range to a safe condition.

In addition, Range Control and the training unit would coordinate to identify and address any low-order detonations. This includes post-training inspections to verify that all munitions functioned as intended and that no unexploded or partially detonated ordnance remains. Any suspect items would be reported and handled in accordance with explosive ordnance disposal (EOD) procedures to prevent long-term environmental exposure or migration into soils or groundwater.

The *Operational Range Clearance Program*, MCO 3550.12A, requires live-fire ranges (i.e., the Multi-Purpose Maneuver Range and Explosives Training Range) periodically undergo thorough

clearances of any remaining ammunition, dunnage, and other debris resulting from military activities. The appropriate frequency of range clearance activities is determined for each live-fire range based on the recorded data on munitions expenditures along with visual assessments of the range. Further, measures to limit erosion and prevent stormwater from leaving live-fire ranges would be implemented, as described in Appendix D. The specific measures for each live-fire range would be determined during the design of the range to maximize effectiveness. Finally, the USMC would implement a Range Environmental Vulnerability Assessment, which would be conducted one year after the range begins operations and reassessed every five years. Mitigating environmental impacts from active ranges complies with the requirements outlined in DoD Instruction 4715.14, *Operational Range Assessments*.

Training under Alternative 1 would result in increased vehicle traffic on paved and unpaved roadways within the Military Lease Area during training events. Increased vehicular traffic on key transportation routes would occur at the beginning and end of training events, when materials and equipment may be transported from TNI or the Port of Tinian on local roadways, primarily 8th Avenue, but Broadway may also be used. Due to the limited traffic volumes on the primary roadways within the Military Lease Area (refer to Section 3.7, Transportation), this increased activity is unlikely to impact public health and safety related to potential collisions, road wear, and reduced visibility due to dust. Although the risks are minimal, they would be further reduced through Range Control's oversight and adherence to speed limits and road safety regulations. When warranted, traffic control measures would be employed, including signage, flaggers, or temporary access control points to ensure the public remains safely separated from military training activities. Range Control and training personnel would monitor military vehicle traffic to ensure compliance with safety guidelines, while coordination with local authorities would help manage traffic flow and minimize disruptions.

Range Control would manage access to the areas around live-fire ranges and areas where munitions are temporarily staged to maintain public safety while live-fire training is occurring. The proposed surface danger zones for the Multi-Purpose Maneuver Range and Explosives Training Range are shown in Figure 4.10-1 and the explosive safety quantity distance arcs for the ammunition holding areas are shown on Figure 4.10-2. The temporary staging of ammunition at the holding areas poses risks such as accidental detonation, fire, or unauthorized access, potentially resulting in injuries, property damage, or environmental contamination. To reduce these risks, the training units would ensure that staging areas are secured and monitored to prevent unauthorized access, and handling procedures comply with DoD safety regulations. Range Control would implement measures to control access within the explosive safety quantity distance while live ammunition is present during training. This may include temporary restrictions along the segment of Boston Post Road that falls within the explosive safety quantity distance arc shown on Figure 4.10-2 during training. However, these restrictions would be temporary and limited to a small portion of this road and the public would be able to access alternate routes within the North Field National Historic Landmark during these time periods while live-ammunition is present.

Surface danger zones are established to protect personnel, equipment, and the public by restricting access to areas where projectiles, fragments, or ricochets from live-fire training may pose a hazard. For the Multi-Purpose Maneuver Range, the surface danger zone extends over land and offshore waters at the northern tip of Tinian (Puntan Taddong) and would only be activated during live-fire events. The Multi-Purpose Maneuver Range would also be certified for use of Class 3b and Class

4 lasers and firing positions for indirect weapons, such as mortars firing inert ammunition. All firing activities would be conducted in accordance with the established surface danger zones. When surface danger zones are activated, access to the affected area would be temporarily restricted. Range Control would issue advance public notices, including Notices to Mariners, identifying scheduled live-fire training and the specific surface danger zone affected. Real-time updates would also be provided using multiple communication channels to help mariners plan around temporary closures. These access restrictions would occur intermittently and only during scheduled live-fire training, allowing unrestricted access at other times. Nighttime impacts are expected to be minimal due to limited range use and reduced maritime activity. To further ensure boater safety, Range Control would actively monitor the area with surface radar and/or spotters. Efforts would be made to communicate with any vessel approaching an active surface danger zone.

To minimize impacts to boaters by ensuring the smallest area is restricted during each training event, the USMC would establish three separate surface danger zones for the Multi-Purpose Maneuver Range, one for each of the three types of ammunition proposed (Figure 4.10-1). When live-fire training occurs, the surface danger zone would be activated and vessels would be required to reroute around the area for period of time. These restrictions could add approximately 2 to 4 miles to travel distances, depending on which surface danger zone is active. Potential impacts would vary based on factors such as the sea state—the ocean waters off the northeastern coast of Tinian are subject to rough sea states from November through April due to cold temperatures, strong northeast trade winds, and swells (R. Dela Cruz, Jr, Personal Communication, 2025; R Sablan, Personal Communication, 2025). These strong currents, coupled with shallow water hazards, limit access to those areas during this period, resulting in lower levels of fishing and boating activity. Conversely, during the calmer season from May through October—especially from June through September—boaters are more likely to transit these areas, making temporary surface danger zone closures potentially more impactful during those months. However, the limited frequency, duration, and size of closures, and the relatively minor distances vessels would need to travel would result in less than significant impacts to boaters from live-fire training under Alternative 1.

As described in Section 2.1.6.3, the FAA would advise the USMC whether there is a need to establish a controlled firing area airspace designation over either or both proposed ranges. A controlled firing area is uncharted airspace designated by the FAA to contain activities that, if not conducted in a controlled environment, could be hazardous to non-participating aircraft (FAA Joint Order 7400.2N, Chapter 27, June 17, 2021). The establishment of a controlled firing area would require the USMC to immediately suspend training events when a spotter identifies a non-participating aircraft approaching the area of operations. This is the procedure that the USMC proposes to follow regardless of whether an airspace designation is required by the FAA.

The Explosives Training Range presents additional potential risks for fragmentation hazards and exposure to hazardous materials. To reduce these risks, Range Control would ensure that clear signage marks range boundaries and restricted access, while road guards and barriers would be in place to prevent unauthorized entry during active live-fire training events. Range Control would enforce the surface danger zone and oversee safety protocols, ensuring all explosives are fully consumed upon detonation. Post-training inspections would be conducted to confirm no unexploded ordnance or hazardous materials remain.

Figure 4.10-1 Surface Danger Zones

Figure 4.10-2 Ammunition Holding Area Explosive Safety Quantity-Distance Arcs

4.10.3.2 Aviation Training and Civilian Aviation

The proposed action, which includes military aviation operations within the Military Lease Area and surrounding airspace, presents potential risks to public health and safety, particularly in shared airspace used by commercial, private, and military aircraft. Areas of concern include airspace conflicts, overflight of live-fire ranges, interference with Saipan International Airport's Instrument Landing System, and increased military aircraft operations resulting from improvements to North Field and the creation of Landing Zones throughout the Military Lease Area.

One of the primary risks is the overflight of live-fire ranges by commercial and private aircraft. To reduce this risk, Notice to Airmen (NOTAMs) would be issued to inform pilots of range activity. Range flags and red warning lights would be utilized to visually indicate when live-fire training is active. Additionally, radar systems and spotters would monitor the airspace for approaching aircraft. If aircraft enter the danger zone, all live-fire activities would be immediately suspended until the aircraft has safely departed the danger zone.

Another concern is interference between live-fire training at the Multi-Purpose Maneuver Range and commercial aircraft using Saipan's Instrument Landing System approach paths. To prevent conflicts, all live-fire training would be suspended whenever aircraft are utilizing the Instrument Landing System at Saipan International Airport. Range Control would coordinate flight scheduling with Saipan International Airport to ensure that military training units are aware of these commercial flight operations. Additionally, radar and spotters would continuously monitor the airspace to detect approaching aircraft, allowing for real-time adjustments to training activities to prevent disruptions.

Aviation operations at the Landing Zones and North Field have the potential to cause injury or damage to personal property for non-participating personnel in the vicinity of training activities. To reduce these risks, Range Control would identify activities that present hazards to the public, including takeoffs, landings, specialized insertion techniques such as fast-roping and rappelling, and parachute operations, and implement appropriate control measures to protect public safety. Prior to training exercises, training area closures would be announced to the public, ensuring awareness and preventing unintended entry into designated training zones. Additionally, access restrictions would be enforced through road guards and/or signage, clearly marking restricted areas to enhance public safety and minimize the risk of accidents.

Military aircraft operating in shared airspace with commercial and private aircraft also pose potential risks. To reduce these risks, Range Control would share military flight schedules to Tinian and Saipan International Airports, ensuring coordination between military and civilian aviation operations. Military aircraft would operate under Visual Flight Rules using "see and avoid" procedures, allowing pilots to maintain visual separation from civilian aircraft and take necessary evasive actions if required.

Adherence to air traffic management protocols and proactive deconfliction measures would ensure that military training can be conducted safely without significant disruption to civilian aviation or public airspace use. With the implementation of airspace coordination, real-time monitoring, and controlled scheduling, the proposed aviation operations would have less than significant effects on public health and safety.

4.10.3.3 Radio Frequency and Microwave Emissions

Under Alternative 1, the USMC would reuse three of the existing communications towers at the Base Camp on Tinian and up to four towers at Saipan during training events. The operation of these communications towers would provide coverage for all training activities within the Military Lease Area. In addition, two surface radar towers on the northern and northwestern coasts of Tinian would be operated to survey the ocean surface. The surface radar towers and communication towers would be secured with fencing and intrusion detection systems to prevent unauthorized access and public exposure to electromagnetic radiation.

During aviation training activities at North Field, a mobile air surveillance radar system known as the Ground/Air Task Oriented Radar (G/ATOR) would be employed to detect virtual threats to the airfield. The system would be set up in the Military Lease Area and could be moved to different locations during an aviation training event. For safety, a minimum of two meters would be maintained between the G/ATOR and military and civilian personnel; 108 meters from the location of an ammunition holding area; and at least 20 meters from the nearest motor vehicle or aviation fueling location.

Coordination with local frequency managers and avoidance of interference with civilian communication and air traffic control systems would further ensure electromagnetic compatibility. With these safeguards and control measures in place, the potential for public exposure or interference with civilian systems would be low and impacts from electromagnetic radiation under Alternative 1 would be less than significant.

4.10.3.4 Natural Hazards

Wildfire

Under Alternative 1, there is risk that potential wildfires could occur with live-fire ranges training and aviation operations at Landing Zones. The USMC would prepare an Integrated Wildland Fire Management Plan for training events on Tinian that would provide a comprehensive approach to reduce the frequency of training-initiated wildland fires. By adhering to the guidelines of the Integrated Wildland Fire Management Plan, training events would result in no increase in risk of wildfires.

Flood Zones

Training events conducted near the shore areas in the Military Lease Area may experience temporary episodic flooding during storms or high tides, but training events would not increase or exacerbate the impact of flooding in near shore areas. The northern border of the proposed North Field Drop Zone, between runway Able and Boston Post Road, is located adjacent to an area designated as a Federal Emergency Management Agency 100-year Flood Zone. Alternative 1 would not increase a flood zone or create additional flood risks.

4.10.3.5 Construction

Construction would periodically limit access to portions of the Military Lease Area to protect the public from construction traffic and activities. These closures would be coordinated with Range Control to ensure the public is notified. In the event of a natural disaster such as a tsunami or typhoon, the response plan would provide information and guidance for maintaining the safety of the construction site and personnel.

Construction best management practices for fire safety, such as fire risk evaluation and fire prevention training, would be implemented to reduce or eliminate the potential for construction-sparked fires. In addition, construction of training infrastructure would not occur in areas designated as Federal Emergency Management Agency flood zones and would not create additional flood areas. Construction would avoid known sinkholes, and fault lines. An engineering evaluation would be conducted before siting structures. Structures would be constructed to current UFC requirements including seismic standards and for withstanding high winds and rain.

Through the use of best management practices, monitoring, and coordination with Range Control, Alternative 1 would not increase public health and safety risks from construction.

4.10.3.6 Protection of Children

Construction and training events would take place in the Military Lease Area with infrequent transit of personnel and equipment on roads from the Port of Tinian or TNI. Children on Tinian reside in the village of San Jose, south of the Military Lease Area, where there is a concentration of housing, schools, parks, and playgrounds. All training events and construction would take place within the Military Lease Area. The closest training areas of the Base Camp and Landing Zone 1 are approximately 1.5 miles from the closest private property and approximately 3 miles from San Jose. Construction sites in the Military Lease Area would be secured with fencing or other barriers to prevent public access. As discussed above, all training events are managed through Range Control with appropriate notifications to the community. All sources of electromagnetic radiation, including radar and communication systems, would be operated in controlled areas and secured to prevent unauthorized access or incidental exposure, including to children. Given the distances of construction and training events away from populated areas, along with active controls at construction sites and during training events to protect the public, implementation of the Proposed Action would not result in health and safety risks that may disproportionately affect children.

4.10.4 Alternative 2

Under Alternative 2, training would continue and would increase over the No Action Alternative by approximately 5 percent, which is approximately 10 percent less than Alternative 1. All of the same precautions associated with Alternative 1, including that all scheduled training events would be coordinated and communicated through Range Control, would result in a less than significant impact to public health and safety from Alternative 2.

4.11 Utilities

4.11.1 Approach to Analysis

The analysis of potential impacts to utilities focuses on water supply (potable water, non-potable water, and groundwater), wastewater treatment, solid waste, hazardous materials, green waste, stormwater management, electrical power, and communications.

This analysis uses quantitative and qualitative assessments of changes to utilities capacity to determine the potential for training events and construction of the Proposed Action to exceed existing utility capacity or to disrupt existing utilities' services. Factors used to assess the impacts of the Proposed Action on utilities include the following:

- The capacity of existing and planned utilities to accommodate the Proposed Action.
- The extent of utilities disruption, if any, from the Proposed Action.

The analysis is based on training and operational needs, such as fire protection, a vehicle wash facility, and the maximum number of personnel anticipated to be on island at one time: 1,000 training personnel, approximately 30 to 50 operational personnel, and approximately 50 off-island construction workers. Of the 30 to 50 operational personnel, 20 are assumed to be from off-island and 30 are assumed to be current island residents. New or improved utilities would be designed to meet peak demand during training.

4.11.2 No Action Alternative

Under the No Action Alternative, ground and aviation training events would continue in the Military Lease Area with the same activities and at the same tempo as described in previous NEPA documents (DON 2015). Additionally, all actions related to the U.S. Air Force Divert Activities project (U.S. Air Force 2016, 2020) would be implemented. Under the No Action Alternative, no changes would occur and there would be no impact on utilities.

4.11.3 Alternative 1

No military training is proposed to occur on Saipan, but the DoD would negotiate a lease or use an agreement for the USAGM Saipan site and utilize existing towers for communication capabilities. Additional communication equipment would be added to existing towers. Consequently, there would be no impacts to utilities on Saipan.

4.11.3.1 Potable Water Supply

Training

Alternative 1 includes two new water systems at two locations within the Military Lease Area: one south of the Base Camp at either Well Field Option "A" or Well Field Option "B," and another at North Field south of the Multi-Purpose Maneuver Range (Figure 4.11-1). The Base Camp water system would comply with the Federal Safe Drinking Water Act and the CNMI Drinking Water Regulations. The North Field water system proposed for firefighting is not expected to comply with these regulations. No connection with the Commonwealth Utilities Corporation water system is proposed. No treatment of groundwater is anticipated to be needed, other than disinfection. Groundwater production from new wells would be metered and used according to terms of Bureau of Environmental and Coastal Quality issued permits. Excess capacity could be made available for agricultural or other uses approved by the USMC.

The Base Camp water system would consist of up to four new or rehabilitated groundwater wells, above ground storage of approximately 300,000 gallons, and a booster pump station. The system would be designed to convey a maximum of 241,376 gallons per day to supply both:

- Maximum estimated water use in a single day, which includes potable water for drinking, bathing, washing, cleaning, cooking for the maximum number of military trainees and operations staff on the island at one time, and the vehicle wash facility.
- Fire demands for firefighting and fire suppression in conformance with United Facilities Criteria 3-600-01, Fire Protection Engineering for Facilities and National Fire Protection Association 1, Fire Code.

The North Field water system is proposed to consist of up to two new or rehabilitated groundwater wells, each with approximately 100,000 gallons of aboveground storage, and a booster pump station. It would be designed to convey a maximum of 86,400 gallons per day to supply fire

demands for firefighting and fire suppression. The system would not operate continuously and would only be used for firefighting purposes. Based on wildland firefighting recommendations, the estimated annual volume of non-potable water used would not exceed 800,000 gallons per year.

These new water systems are sized to meet all potable and non-potable water demands of Alternative 1 within the Military Lease Area. As discussed in Section 4.13 Groundwater and Hydrology, there would be sufficient groundwater and recharge to meet both the existing and projected potable and non-potable water demands by Commonwealth Utilities Corporation, the military, and other users. As a result, Alternative 1 would have a less than significant impact to the Tinian potable water supply. See Appendix M, Utility Studies, for additional information and calculations.

It is anticipated that construction workers and permanent Range Management personnel would live outside the Military Lease Area in homes, apartments, or hotels. Table 4.11-1 summarizes the additional average daily domestic demands due to the Proposed Action under Alternative 1 that would be met by the Commonwealth Utilities Corporation.

Table 4.11-1 Average Day Water Demand on Commonwealth Utilities Corporation Water System from Training Events Under Alternative 1

Personnel Type	*Use Category*[1]	*Unit Demand (gpcd)*	*Population*	*Demand (gpd)*
Construction Workers (24-hour)	Family Housing	125	50	6,250
Off-Island Range Management Personnel (24-hour)[2]	Family Housing	125	20	2,500
			Total	**8,750**

Legend: gpcd = gallons per capita per day; gpd = gallons per day; UFC = Unified Facilities Criteria.
Notes: [1]Per UFC 3-230-03, Table 3-1.
[2]Only personnel relocating from off-island are included here.

A central biosecurity wash facility is proposed at the Port of Tinian. Military vehicles would be washed here after training is complete and prior to loading onto vessels for transport off-island. The wash facility would be a contained concrete structure where multiple vehicles can be washed simultaneously using permanently mounted cleaning equipment. Wash water would be contained during the washing cycle and recycled. Once the wash cycles are complete, wash water would be pumped out and disposed of in conformance with CNMI regulations. The water demand for the proposed wash facility would be 924 gallons per day.

A summary of water demands on the Commonwealth Utilities Corporation is provided in Table 4.11-2.

Table 4.11-2 Summary of Existing and Proposed Water Demands on Commonwealth Utilities Corporation Under Alternative 1

Category	*Average Day Demand (MGD)*
Existing CUC Production[1]	0.85
Proposed Additional Domestic Demand	0.0088
Proposed Additional Industrial Demand[2]	0.0009
Total Demand on CUC Water System	**0.86**

Legend: CUC = Commonwealth Utilities Corporation; MGD = million gallons per day.
Notes: [1]Average of production at Maui Well Number 2 from 2019 to 2023.
[2]Biosecurity Wash Facility at the Port of Tinian.

The average daily production from Maui Well Number 2 between 2019 and 2023 was 0.85 million gallons per day, which is less than the estimated aquifer drought capacity at Maui Well Number 2 of 1.0 million gallons per day (USMC 2016). The Proposed Action under Alternative 1 is estimated to increase water production at Maui Well Number 2 by 1.14 percent. The sum of existing water production and proposed water demand is approximately 0.86 million gallons per day, which results in 0.14 million gallons per day of remaining aquifer drought capacity. Because of this, Alternative 1 would have a less than significant impact to the Commonwealth Utilities Corporation water system.

Construction

Industrial demands during construction would include mixing concrete, earthwork compaction, dust control, hydrostatic pressure testing, and cleaning. All water for construction could be purchased from the Tinian Mayor's Office at Well M-21. The U.S. Air Force is currently constructing the Divert Activities project at TNI and Well M-21 is being used for construction of that project. Well M-21's extraction capacity was 1.8 million gallons per month in 2024 (J. Aldieri, NAVFAC Marianas, Personal Communication, 2024), or 21.6 million gallons per year, and all of that water is used for construction.

Construction of the U.S. Air Force Divert Activities project would be completed prior to starting construction of the Proposed Action. It is anticipated that the contractors for the Proposed Action would make arrangements with the Tinian Mayor's Office to use Well M-21 for construction water.

The Proposed Action is substantially smaller in size and scope than the U.S. Air Force Divert Activities project and would use much less water during construction. To be conservative, it is assumed that the same quantity of water, 21.6 million gallons per year, would be used in construction of the Proposed Action. The U.S. Air Force Divert Activities project use is within the capacity of the well. Therefore, Alternative 1 would have a less than significant impact to the Commonwealth Utilities Corporation water system during construction.

Figure 4.11-1 Water Infrastructure Included in Proposed Action

4.11.3.2 Wastewater Treatment

Training

Alternative 1 includes adding new septic tanks, leach fields, and sanitary sewer collection pipelines to treat wastewater. This new wastewater infrastructure would be sized to meet the needs of maximum personnel during a large training event (Table 4.11-3).

Table 4.11-3 Wastewater demand on Proposed Wastewater Infrastructure Under Alternative 1

Personnel Type	*Category*	*Unit Demand (gpcd)*	*Population*	*Average Day Demand (gpd)*
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 Wastewater Demand				**53,000**

Legend: gpcd = gallons per capita per day; gpd = gallons per day.
Source: Appendix M, Utility Studies.

Wastewater service outside of the Base Camp would be provided using portable toilets. These portable toilets would be periodically emptied by licensed haulers and disposed of at the new septic system, at the existing DoD septic system, or 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 by licensed haulers 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). Septic sludge that contains free liquids cannot be disposed in the existing Puntan Diablo Landfill or at the planned Atgidon Landfill.

The Proposed Action includes construction of new wastewater infrastructure at the Base Camp, which would be operated and maintained by the USMC. The new wastewater infrastructure could include a sanitary sewer collection system, a sewer lift station, and one or more septic systems. Septic systems can accommodate the wide variation in wastewater flow anticipated between military training and non-training periods. Alternative 1 would have a less than significant impact on wastewater because the proposed Base Camp site does not appear to be within either a Class I or II Aquifer Recharge Area/Groundwater Protection Zone on Tinian (CNMI Bureau of Environmental and Coastal Quality 2025).

Construction

Wastewater generated during construction before the septic system is established would be collected in portable toilets. These portable toilets would be periodically emptied by licensed haulers and disposed of at the new septic system at the Base Camp, or at the existing Department of Navy septic system, or at a septage disposal site approved by the CNMI Bureau of Environmental and Coastal Quality per section 65-120-1405 (CNMI Code of Regulations).

Therefore, Alternative 1 would have a less than significant impact on wastewater during construction.

4.11.3.3 Solid Waste

Training

Proposed training events would result in additional solid waste generation. Quantities of waste generated would vary depending on the frequency of training events, duration of training events, and the number of personnel participating in training. Using the maximum of 1,000 personnel participating in training at any one time, the projected waste quantities generated during ongoing training and maintenance under Alternative 1 are presented below.

Current DoD policy mandates minimum diversion from disposal (landfilling and non-waste-to-energy incineration) of 40 percent of non-hazardous solid waste (excluding construction and demolition waste). The USMC is unlikely to meet the 40 percent solid waste diversion goal due to its remote location, which has limited recycling services and no domestic consumption of diverted materials. Based on local available recycling infrastructure, the waste material types that are anticipated to be generated and the variable and transient population participating in training, a diversion rate of 12 percent is assumed.

As shown in Table 4.11-4, training activity under Alternative 1 would generate an estimated 562 tons/year. During periods when no training is taking place and only the permanent facility staff and construction workers are present, the weekly solid waste generated is estimated to be approximately 1.2 tons/ week (63 tons/year) with an average daily generation of 0.17 tons/day. During periods of training, the maximum solid waste generation is estimated to be 3.67 tons/day. The CNMI proposed new solid waste facilities would be sized to manage the maximum projected weekly solid waste generated on the island.

Table 4.11-4 Solid Waste During Operations Under Alternative 1

Solid Waste	*Alternative 1*
Estimated Annual Solid Waste Generated (tons)	562
Diversion Rate	12%
Diverted from Disposal (tons)	67
Landfill or Incinerator Disposal (tons)	495

Legend: % = percent.
Source: Appendix M, *Utility Studies*.

The CNMI is currently developing a Draft Comprehensive Integrated Solid Waste Management Plan with community input, which includes coordination with the USMC. The *Solid and Hazardous Waste Study* for CJMT (See Appendix M, Utility Studies, for this study) identifies solid and hazardous waste management options that align with the CNMI Integrated Solid Waste Management Plan and presents additional option(s) for further consideration by CNMI.

The Puntan Diablo disposal facility does not currently comply with the CNMI Administrative Code Chapter 65-80 Solid Waste Management Regulations or the Resource Conservation and Recovery Act Subtitle D regulations applicable to solid waste landfills (40 C.F.R. Part 258.1(f)(1)) and is unavailable for USMC waste. The CNMI intends to permit the facility by demonstrating compliance with the small community exemption available in Resource Conservation and Recovery Act Subtitle D regulations. The anticipated timeline to complete the permitting process

is 6 to 12 months. USMC, contingent upon receiving authorization from the CNMI, would utilize the Puntan Diablo disposal facility once it is permitted.

Because the existing Puntan Diablo disposal facility has limited remaining capacity, the CNMI is initiating permitting efforts for a new landfill at Atgidon site, located north of 86th Street and between Riverside Drive and 10th Avenue. The CNMI anticipates permitting of this new landfill would take 5 years to complete. Only non-hazardous waste would be allowed at both the to-be permitted Puntan Diablo disposal facility and the planned Atgidon landfill. Septic sludge that contains free liquids cannot be disposed of in these landfills and would be disposed of at the septic disposal site discussed in the wastewater section above.

The Tinian Transfer Station and Recycling Center is currently permitted to receive only source-separated recyclable materials such as cardboard/paper, plastic bottles, and aluminum cans. Recyclable materials are shipped off the island for processing and sale, and the costs of handling and transportation exceed the revenue generated by the sale of the recyclables. According to the *CNMI Comprehensive Integrated Solid Waste Management Plan 2025-2030*, the transfer station is funded by tipping fees, a beautification tax, and general funds. If approved by the CNMI, the Tinian Transfer Station and Recycling Center would be available for use by USMC (CNMI Office of Planning and Development 2024).

All potential disposal locations have sufficient capacity to accept the waste generated by Alternative 1. Because solid waste would be disposed of at a facility that is permitted under Resource Conservation and Recovery Act Subtitle D and the anticipated waste quantities would not be substantial relative to capacity of any of the identified landfills, the operation would result in a less than significant impact to solid waste utilities.

If the planned permitting of the Puntan Diablo disposal facility and the proposed Atgidon landfill are not completed and landfill disposal capacity is not available, the alternate management methods for solid waste generated by the Proposed Action under Alternative 1 would include: 1) transport solid waste to Marpi Landfill on Saipan; 2) on-site incineration of waste to reduce the volume prior to the transport of the residual non-hazardous ash to Marpi Landfill; or 3) transport the waste to one or more off-island facilities authorized to accept DoD waste. If using incineration to minimize waste volume, the incinerator would be a commercially available solid waste incineration unit that meets U.S. EPA emissions guidelines with a capacity sufficient to handle the Proposed Action-generated waste, and would require approval and permitting by the CNMI before use. Potential impacts to the Marpi Landfill operation itself (projected disposal tonnage) have been evaluated and presented in the Solid and Hazardous Waste Study (refer to Appendix M, *Utility Studies*), and there would be sufficient capacity for use by USMC.

Construction

Current U.S. DoD Integrated Solid Waste Management policy sets a minimum diversion from landfilling or non-waste-to-energy incineration of 60 percent for construction and demolition waste (Office of the Assistant Secretary of Defense 2020). Given that the majority of construction and demolition waste to be generated is anticipated to be concrete and wood, the mandated diversion rate of 60 percent would be achievable by mandatory diversion and reuse requirements which would be included as performance requirements in all construction contracts. Based on the anticipated project development phasing and the 60 percent diversion rate, Alternative 1

construction activities would result in the quantities of construction and demolition waste generation, diversion and disposal shown in Table 4.11-5.

Table 4.11-5 Construction and Demolition Waste Generated During Alternative 1

Year	*Construction and Demolition Waste*					
	Total Generated		*Total Diverted/Recycled*		*Total Disposal*	
	Annual (tons)	*Daily Average (tons)*	*Annual (tons)*	*Daily Average (tons)*	*Annual (tons)*	*Daily Average (tons)*
2026	0	0	0	0	0	0
2027	0	0	0	0	0	0
2028	49	0.13	29	0.08	20	0.05
2030	47	0.13	28	0.08	19	0.05
2031	17	0.05	10	0.03	7	0.02
2033	78	0.21	47	0.13	31	0.09
2036	57	0.16	34	0.09	23	0.06
2038	27	0.07	16	0.04	11	0.03
2039	8	0.02	5	0.01	3	0.01

Legend: SF = square feet.
Note: Construction and demolition waste generation estimated to be 4.34 pounds/square foot (U.S. EPA 2003) of developed impervious area associated with new structures/buildings. Construction and demolition waste generation estimated to be 1.09 pounds/square foot of developed impervious area associated with new concrete surfacing.
Source: U.S. EPA 2003.

Construction personnel would also generate a maximum of 31 additional tons per year of solid waste. See Appendix M, *Utility Studies*, for detailed solid waste calculations. With construction projected to commence in 2026 and the CNMI's plans for landfill permitting and development, it is expected that on-island landfill capacity would be sufficient to manage the USMC solid waste generated through project construction. If planned permitting of the Puntan Diablo disposal facility and the proposed Atgidon landfill are not completed and landfill disposal capacity is not available, the alternate management methods for construction-related solid waste would be the same as described for training, above.

4.11.3.4 Hazardous Materials

Training

Training events are currently conducted in compliance with standard operating procedures and federal and CNMI laws governing management and disposal of hazardous materials. All training is coordinated with Joint Region Marianas environmental staff, who work with federal and CNMI agencies as required. As part of current training, temporary portable aboveground bulk diesel storage containers have been staged and used at North Field (DON 2014a). The military ensures proper storage and handling of hazardous materials inside areas equipped with impervious barriers and utilizes dual containment structures to further prevent spills or releases. Hazardous materials handling and storage areas are located away from catch basins, storm drains, and waterways. Spill response kits are located in close proximity to all areas where hazardous materials are handled. Personnel responsible for the handling and storage of hazardous materials receive regular training. The military also complies with the Tinian Spill Control Plan and has trained spill response teams

available during training events (M. Cruz, Joint Region Marianas, Personal Communication, December 2014).

Excess or unusable hazardous material such as grease and oil from training events and paint and cleaning products from Base Camp would be transported off-island for characterization and reuse or disposal in accordance with applicable regulations. Any disposal would be at an Environmental Protection Agency-permitted hazardous waste disposal facility. Transportation of all hazardous material would be coordinated through Defense Logistics Agency Disposition Services in compliance with U.S. Department of Transportation regulations and C.F.R. Title 49. Because all generated hazardous material would be removed from the island and disposed of according to relevant laws and regulations, the proposed training events for Alternative 1 would have a less than significant impact to hazardous materials disposal on Tinian.

Construction

Hazardous, industrial, universal wastes, and e-waste generated by construction on Tinian would be disposed of off-island in compliance with applicable U.S. Environmental Protection Agency regulations. Because all hazardous material generated would be removed from the island and disposed of according to relevant laws and regulations, the proposed construction activities for Alternative 1 would have a less than significant impact to hazardous materials disposal on Tinian.

4.11.3.5 Green Waste

Training

Regular cutting and/or mowing of cleared areas in the Military Lease Area Range Complex to prevent re-growth and re-establishment of bushes and trees would be the only source of green waste generated after construction projects are complete. Because cutting and/or mowing would be conducted regularly (typically weekly) the green waste generated would be minimal and left on the ground to naturally decompose, thereby eliminating the need to collect and manage the green waste. This practice to maintain landscaping has been used historically for the existing cleared areas within the proposed Base Camp when the site was formerly in use as the USAGM transmitting facility and would become the standard practice to maintain all newly cleared areas under Alternative 1. Training under Alternative 1 would result in no demand for or change in the green waste processing capacity at the Tinian Organics Processing Site, and therefore Alternative 1 would result in no impact associated with green waste processing or disposal.

Construction

Site development and construction would require clearing of trees, brush, and grasses, which would generate green waste. Green waste would be processed by the construction contractor through a grinder or chipper to size-reduce the material into a chipped product. USMC would coordinate with CNMI to determine where the chipped green waste would be stockpiled. The material would be available for use by the contractor in the development of project facilities and/or could be made available to the residents of Tinian. This process is being successfully implemented in the U.S. Air Force Divert construction. See Appendix M, Utility Studies for a discussion of management methods for mulch product if the presence of the coconut rhinoceros beetle is confirmed.

The U.S. Air Force is clearing vegetation under a separate project along some of the runways, taxiways, and roadways within North Field and this would be completed prior to construction of Alternative 1. The proposed drop zone at North Field overlaps this same area and vegetation that would be removed by the U.S. Air Force is not included in this analysis. Vegetation clearing required for other North Field proposed improvements, including the surface radar tower sites and water infrastructure is analyzed. Table 4.11-6 summarizes the estimated tons of green waste generated during construction of all project elements.

Table 4.11-6 Projected Green Waste Generation During Construction Under Alternative 1

Year	*Volume (cubic yards)*	*Weight (tons)*
2026	82,478	20,619
2027	82,478	20,619
2028	125,906	31,477
2030	35,325	8,831
2031	0	0
2033	0	0
2036	0	0
2038	6,964	1,741
2039	3,913	978

With CNMI approved processing of green waste from construction, Alternative 1 would create a less than significant impact from the generation of green waste.

4.11.3.6 Stormwater

Training

Alternative 1 includes maintaining cleared land. Best management practices would be employed to reduce potential impacts to stormwater per the *CNMI and Guam Stormwater Management Manual* (Horsley Witten Group, Inc. 2006) during operation. Best management practices include bioretention basins, swales, porous pavement, and hydrodynamic separators. See Appendix M, Utility Studies, for additional stormwater information and calculations.

Stormwater runoff from the proposed Multi-Purpose Maneuver Range would discharge to a tributary system that flows to the ocean. Best management practices approved for operational ranges and control of munitions constituents, such as the collection of spent munitions and brass at the conclusion of training events by the USMC, would be implemented. Given the potential for stormwater discharge to reach Waters of the U.S., National Pollutant Discharge Elimination System permit coverage would need to be obtained unless infiltration proves fully feasible across all discharge areas.

Provided that best management practices are implemented and National Pollutant Discharge Elimination System permit coverage is obtained where required, Alternative 1 would employ best management practices during training events and would have a less than significant impact on stormwater quality.

Construction

Alternative 1 would involve land clearing and the construction of impervious surfaces, including paved roads, parking areas, and buildings, which would increase stormwater runoff. To reduce potential stormwater-related impacts, temporary erosion and sediment control BMPs would be implemented during construction in accordance with the *CNMI and Guam Stormwater Management Manual* (Horsley Witten Group, Inc. 2006). Because the combined area of disturbance would exceed 1 acre, the project would obtain coverage under the EPA Region 9 Construction General Permit and prepare a project-wide Stormwater Pollution Prevention Plan These during-construction BMPs would include:

- Silt fences, sediment traps, and fiber rolls to prevent sediment from leaving the construction site.
- Temporary sediment basins to capture runoff and reduce turbidity in stormwater discharges.
- Stabilized construction entrances/exits to minimize sediment tracking onto paved roads.
- Watering and dust suppression to prevent airborne pollutant transport.
- Phased grading and revegetation to minimize exposed soil and erosion potential.

Additionally, post-construction stormwater BMPs, including bioretention basins, vegetated swales, porous pavement, and hydrodynamic separators, would be installed as part of the final site development to manage long-term stormwater runoff and water quality. These permanent BMPs are designed to mimic natural hydrology, reduce peak flows, and enhance infiltration.

The project would also adhere to the *Department of the Navy Low Impact Development (LID) Policy for Stormwater Management* (NAVFAC EXWC 2015), which establishes additional requirements to minimize post-construction stormwater impacts. Key LID strategies guiding the project include:

- Managing stormwater at its source through decentralized, small-scale controls.
- Integrating stormwater management features into site design for dual functionality and aesthetics.
- Utilizing structural stormwater controls, such as bioretention basins and infiltration basins, where appropriate.

By implementing temporary BMPs during construction and permanent Low Impact Development policy post-construction, Alternative 1 would effectively reduce stormwater impacts, ensuring compliance with regulatory requirements and minimizing potential water quality effects. As a result, stormwater quality impacts are expected to be less than significant.

4.11.3.7 Electrical Power System

Training

The proposed training operations would add an estimated 0.146 megawatts of peak electricity demand to operate facilities and supporting infrastructure and equipment. This increase in peak demand would represent 1.15 percent of the total system capacity. Table 4.11-7 provides a summary of existing and proposed electrical demands relative to the existing electrical system capacity. With this added electrical demand, the system would maintain a 9.55-megawatt capacity reserve, which is 75.2 percent of the total system capacity. As a result, the existing island-wide

power generation facility is sufficient to meet the increased power demand during proposed operations. Therefore, Alternative 1 would have a less than significant impact to electrical utilities.

Table 4.11-7 Annual Electrical Power System Peak Demand and Capacity Under Alternative 1

Item	*MW of Electricity*	*% of System Capacity*
Tinian Power Plant Effective Design Capacity	12.70	100
Peak Electrical Demand from Existing Customers	3.00	23.5
Additional Peak Electrical Demand from Proposed Action	0.146	1.15
Total Electrical Demand with Proposed Action	3.146	24.8
Remaining Electrical Generating Capacity with Alternative 1	9.51	75.2

Legend: % = percent; MW = megawatt.
Source: Appendix M, Utility Studies.

Replacement of existing high-powered shortwave transmission station tower with lower powered Radio Frequency antennas would either offset or result in a net increase in the existing electrical distribution capacity. It is anticipated that no modifications on the existing electrical distribution are required since construction activities would not increase load on the electrical system's capacity.

Construction

When a project includes construction of new on-site electrical infrastructure to support facilities, connecting this new infrastructure to the existing supply system requires a localized and temporary interruption of power to existing customers. These supply interruptions would be anticipated for not longer than 6-hour durations, scheduled to allow for advance notification to users, and timed to be least disruptive. This would minimize impacts to existing Commonwealth Utilities Corporation customers and result in less than significant impacts.

New underground, concrete-encased (3000 PSI) duct banks would be installed to support the 13.8/7.9 kilovolt electrical distribution. The existing Feeder 4 overhead line point of connection, north of the TNI to the existing USAGM would be maintained. The underground line to the existing medium voltage switchgear is anticipated to be used to support the proposed Base Camp facilities and existing Communications towers #1, #12 and #16. These Communications towers would be repurposed, provided with new equipment to support the new communications needs. Evaluation of the existing switchgear bus bar condition would be required; repair or replacement may be necessary for re-use. Existing overhead lines along 8th Ave to the former USAGM site would remain as overhead distribution. Emergency power to the Base Camp would be provided from the existing 1.2 megavolt-amperes generator that is currently used to support the USAGM Communications facilities. The use of the existing generator may require the installation of a new load bank to provide operational efficiency and reliability during loss of power or during maintenance. The Base Camp loads along with the communication towers and supporting facilities are anticipated to offset the demobilization of the former USAGM site.

The new underground infrastructure would be extended along 8th Avenue. The current USAGM Feeder 4 would be tapped, and a riser provided for the extension and lateral duct banks to distribute power to the support facilities including surface radar sites (1 and 2), wells located south of the Mult-Purpose Maneuver Range and AHA 1 Pad (Figure 4.11-2). Existing communications towers would require 200 kilovolt-amperes generators be installed to provide back-up power in the event

of power failure. A new underground duct bank would be constructed from the existing overhead line Feeder 4 at power pole, located at the corner of 8th Ave. and 86th St. This underground duct bank would be installed along 86th Street due east to support Base Camp Well Field - Option A or due west towards Base Camp Well Field – Option B, the preferred option. A new underground duct bank would be constructed from the existing overhead line Feeder 3 to support the Port Biosecurity facilities. A newly installed extension of Feeder 4 located north of the TNI, as part of the Tinian Divert Infrastructure Project, would be tapped and routed underground to feed the proposed aircraft shelter which is located just south of the Feeder 4 extension. The overhead line would be intercepted at the nearest power pole and riser down for transition to underground distribution. It is anticipated that an additional peak demand of 0.146 megawatts would be supported by the island electrical system for the aircraft shelter. The exact point of transformation for usable power would be coordinated with the aircraft shelter contractor. Site lighting is required and would use LED fixtures where applicable. Lighting levels would conform to UFC 3-530-01. Lighting loads would have minimal impacts on the electrical distribution system. Additional coordination regarding local wildlife and environmental conditions may be required when providing site lighting.

Alternative Energy Sources for the Base Camp or Supporting Infrastructure

The USMC is proposing to connect to the existing Commonwealth Utilities Corporation system as a rate payer and has verified that there is sufficient capacity for the estimated demand. The Commonwealth Utilities Corporation has plans to increase the amount of energy available from renewable generation over time, which would be supported by the fees paid into the system by the DoD. Diesel generators for this project are only proposed for emergency backup power.

As part of the military construction design process, the USMC would consider situations where renewable energy options could be feasible. Future alternative energy sources such as photovoltaics for both the Base Camp structures would be explored. Remote radar sites may be powered by temporary generators. Using photovoltaic energy, with diesel generators designated as backup, would also increase energy security and enhance the military mission.

Due to their low profiles, solar photovoltaics systems typically represent little risk of interfering with radar transmissions (National Renewable Energy Laboratory 2017). Site lighting would be required and would use LED fixtures where applicable. Lighting levels would conform to UFC 3-530-01.

4.11.3.8 Communications

Training

The proposed training operations under Alternative 1 would include installation of underground telecommunications infrastructure to support government communications systems (e.g., communication towers, surface radar towers, government telephone, government data, security, and closed-circuit television) and connection to commercial utility services, including commercial telephone and internet. Where required for proposed facilities, commercial telephone and internet services would be delivered through infrastructure provided by commercial utility providers. Small, short-term service interruptions may be necessary to facilitate new connections to the existing systems. Impacts associated with the installation and connection of telecommunications infrastructure to support Alternative 1 would be less than significant to utility systems on Tinian.

Military use of the existing information technology infrastructure would be limited to a leased line or a satellite connection to Guam. Because the existing systems have adequate capacity and because connection to the fiber optics system would be a dedicated line lease, the capacity of the existing civilian portion of that cable would not be reduced, and information technology and communication requirements would have no impact on existing utility systems.

Construction

Alternative 1 would include the construction of two new 45-foot-tall surface radar towers and repurposing three communication towers (towers #1, #12 and #16) at the USAGM site. New underground, concrete-encased duct banks would be installed to support the communications distribution. The new underground communications infrastructure would be extended along 8th Avenue. Conduit risers would be provided at the existing overhead lines for the extension and lateral duct banks to distribute the fiber optic system to the support facilities including CJMT wells and communication towers. Existing overhead communication lines to the Base Camp would remain as overhead distribution. The poles currently supporting the overhead lines to the USAGM site would be used to also support the new fiber optic system.

New underground communication lines would run along existing roads to support the North Field water wells and AHA 1.

4.11.4 Alternative 2

The training tempo under Alternative 2 would increase by approximately 5 percent over training already approved to occur on Tinian, which is approximately 10 percent less than Alternative 1. Construction activities under Alternative 1 would also apply to Alternative 2. Therefore, the decrease in tempo would be a less than significant decrease and impacts to utilities under Alternative 2 would be the same as those described for Alternative 1.

Figure 4.11-2 Electrical Power Distribution for Proposed Action

4.12 Topography, Geology, and Soils

4.12.1 Approach to Analysis

The impact analysis for topography, geology, and soils focuses on the surface and subsurface features of land. Aviation training would not affect topography, geology, and soils so analysis of this resource focuses on ground training and construction. For topography, changes to the physical features of an area could potentially result in slope instability that could cause slumping or landslides. The analysis of geology assesses the effects of any large-scale soil or rock removal and the effect on geological functions such as the ability to filter and transmit groundwater. For soils, the analysis focuses on the disturbance of soils and the potential for erosion as a result of training events and construction. Increased soil erosion may also indirectly impact water quality (Sections 4.13 Groundwater and Hydrology and 4.14 Surface Water and Wetlands) and terrestrial biological resources (Section 4.4 Biological Resources).

Prime farmland soils exist within the Military Lease Area. The intent of the Farmland Protection Policy Act (7 U.S.C. section 4201, et seq.) is to minimize the unnecessary and irreversible conversion of farmland (including prime farmland) to nonagricultural uses by federal actions. In accordance with 7 CFR 658.3(b), acquisition or use of farmland by a federal agency for national defense purposes during a national emergency is exempted from compliance with Prime Farmland regulations. Nevertheless, this analysis considers whether prime farmland soils would be irreversibly converted to nonagricultural use under the Proposed Action.

The Proposed Action includes the establishment of a new lease and the reuse of the existing facilities including up to four of the communications towers at the former USAGM site on Saipan. No military training is proposed to occur on Saipan, but ongoing vegetation maintenance would occur at the USAGM site on Saipan. Thus, there would be no impacts to topography, geology, and soils related to the Saipan site.

4.12.2 No Action Alternative

Under the No Action Alternative, training events would continue in the Military Lease Area with the same type of activities and at the same tempo as described in previous NEPA documents (DON 2015). The No Action Alternative includes the U.S. Air Force Divert project improvements (U.S. Air Force 2016, 2020) which were evaluated in previous NEPA documents and are currently under construction and expected to be completed prior to the Proposed Action. No change would occur under the No Action Alternative; therefore, there would be no additional impact on topography, geology or soils.

4.12.3 Alternative 1

4.12.3.1 Training

Topography

Maneuver training on foot would occur in the Military Lease Area. Although repetitive pedestrian movement in the same areas could result in the creation of pathways, changes to the physical features are not expected and this impact is not likely to result in slope instability that could cause slumping or landslides. Ground training operations using vehicles would not result in additional slope instability because this training would be conducted on new or existing roads, around Landing Zones/cleared areas, and previously disturbed areas in the Military Lease Area.

The use of explosives in the Explosives Training Range would cause localized disturbance to the ground, resulting in a crater up to approximately 5 to 7 feet deep and 6 to 8 feet in diameter (i.e., for explosives with a maximum net explosive weight of 40 pounds). Following any detonation resulting in cratering, the area would be refilled by training units. The use of explosives is not expected to initiate landslides because the Explosives Training Range is located in a relatively level area and nearby slopes are composed of limestone.

Other training activities could include road repair and paving; runway repair; installation of AM2 matting on Runway Baker; and simple temporary structures such as tents and temporary fueling bladders. The AM2 matting would be periodically removed, inspected, and replaced to meet maintenance and training requirements. These activities would comply with management measures (Appendix D) to maintain the existing topography, be confined to previously developed areas, and be of intermittent and short duration. Therefore, there would be less than significant impacts to topography associated with training under Alternative 1.

Geology

Neither foot maneuver nor vehicle maneuver training would result in impacts to geology because these activities would not cause any large-scale soil or rock removal or would have minor effect on geological functions such as the ability to filter and transmit groundwater. For any areas that undergo compaction from training (e.g., foot paths or roads) surface runoff and recharge would occur in areas immediately adjacent, resulting in negligible impacts to recharge. The use of explosives in the Explosives Training Range is expected to impact the ground to approximately 5 to 7 feet deep, resulting in disturbance to the underlying bedrock, which is estimated to be at a depth of 1.7 to 3.3 feet in this area (U.S. Department of Agriculture 1989). However, this would impact a relatively small area, resulting in negligible impacts to recharge. Therefore, there would be less than significant impacts to geology associated with training events under Alternative 1.

Soils

As discussed under topography, foot traffic would be dispersed throughout the Military Lease Area and is therefore not expected to generate repeated disturbance in any specific area on a regular basis within the Military Lease Area. Vehicle maneuver training would utilize only new or existing roadways or would occur within Landing Zones/cleared areas and previously disturbed areas. The use of explosives in the Explosives Training Range is expected to recurrently impact soils within a designated cleared area at the Explosives Training Range. Following any detonation resulting in cratering, the area would be refilled by training units. The periodic removal, inspection, and replacement of AM2 matting would occur on the existing paved Runway Baker. As a result, training events would result in less than significant impacts to soils.

Periodic vegetation clearing and thinning and/or maintenance would occur within established training and support areas and the Base Camp within the Military Lease Area. Table 4.12-1 provided areas that would require ongoing vegetation maintenance. There would be minimal direct disturbance of soils during this vegetation maintenance because clearing would be by hand or mechanical devices and not discing, resulting in preserving remaining vegetation, which would protect soils from erosion. Therefore, there would be less than significant impacts to soils associated with training under Alternative 1.

Table 4.12-1 Vegetation Maintenance Under Alternative 1

Facility	*Approximate Area (Acres)*	*Level of Maintenance*
Explosives Training Range	2.5	Requires clearing and thinning of vegetation
Drop Zone	89	Requires clearing and thinning of vegetation between runways Able and Charlie
Landing Zones	157	Requires clearing and maintaining of vegetation to 6-8 inches
Multi-Purpose Maneuver Range	34.7	Requires clearing and thinning of vegetation
New Roads	12	Requires clearing of vegetation
Base Camp	110	Requires continued maintenance mowing of vegetation in existing USAGM cleared areas

4.12.3.2 Construction

Topography

Alternative 1 would involve the construction of two live-fire ranges, an aircraft shelter, Landing Zones, ammunition holding areas, surface radar facilities, new paved and unpaved roads, and utilities. This construction would require earthwork including excavation, fill, transport, and compaction. To minimize the amount of earthwork required, the design of facilities including the radar towers and ammunition holding areas would seek to utilize existing on-site soils and balance the required quantities of excavation and fill. Each facility would be designed to balance cut and fill needs onsite. This eliminates the need for trucking of material and allows for efficient grading. Development of the Base Camp would primarily use the existing USAGM buildings. Other previously disturbed, cleared areas within the USAGM site would accommodate other proposed Base Camp new construction needs, resulting in negligible impacts to topography. Therefore, there would be less than significant impacts to topography associated with construction under Alternative 1.

Geology

Project design and construction would minimize impacts to karst geology by avoiding identified locations of sinkholes, caves, and other karst features. Nearly all proposed infrastructure is located in areas with no known karst features, including the project footprint for the Base Camp (Figure 4.12-1) (Doan et al. 1960). However, the Base Camp Well Field Option B, the proposed water lines, and the aircraft shelter would occur in areas with identified collapsed surface features (Figure 4.12-1). Impacts from development of the Base Camp Well Field Option B and the proposed water lines in areas with identified collapsed surface features are expected to be negligible because the infrastructure associated with these features (i.e., buried pipeline and small equipment buildings) are not expected in land subsident in these areas. The aircraft shelter would be constructed on an area that has already been leveled and stabilized under the U.S. Air Force Divert project improvements, so impacts related to the collapsed surface features are expected to be negligible. For these reasons, and with implementation of design and the management measures listed in Appendix D, there would be less than significant impacts to geology associated with construction under Alternative 1.

Soils

Construction would result in vegetation clearance and direct ground disturbance from cut and fill and grading. Construction activities on Tinian would not occur in areas with highly erodible soils (Figure 4.12-2). As discussed in Section 4.4.3 Biological Resources and presented in Table 4.4-1, approximately 343 acres of vegetation (or 2.3 percent of vegetation in the Military Lease Area) would be permanently cleared to develop the Landing Zones, Multi-Purpose Maneuver Range (i.e., objective/target areas, fire break around the range), utility alignments, Base Camp, Explosives Training Range, drop zone, surface radar towers, potable water well fields (Options A or B), and new roads. Within these areas, direct ground disturbance during construction are shown in Table 4.12-2. A perimeter road would be constructed around the Multi-Purpose Maneuver Range and new access road would be constructed to the Explosives Training Range and three of the Landing Zones (Table 4.12-2). Improvements to existing paved and unpaved roads would primarily include clearance of overgrown vegetation.

Vegetation clearance and direct ground disturbance during construction activities could lead to increased erosion and sediment loads in stormwater runoff. In compliance with the National Pollutant Discharge Elimination System Construction General Permit, a Stormwater Pollution Prevention Plan and construction-specific stormwater management practices such as retention ponds, swales, silt fences, fiber rolls, gravel bag berms, mulch, and erosion control blankets would be implemented to provide erosion and sediment control during construction (Appendix D). These on-site measures would reduce the flow and velocity of stormwater and minimize the transport of soils and sediment off site. This management measure would also include inspection and water sampling performed throughout the construction phase.

Table 4.12-2 Construction Disturbance Under Alternative 1

Facility	*Approximate Area of Direct Ground Disturbance (Acres)*
Aircraft Shelter	1.29
Ammunition Holding Area 1	0.62
Base Camp	4.15
Port Biosecurity/Wash Rack	0.60
Potable Water Well Field and Water Line from Well Field Option A[1]	11.64
Potable Water Well Field and Water Line from Well Field Option B[1]	9.70
Electrical and Communication Line inside the Military Lease Area[2]	5.48
Communication Line outside the Military Lease Area[2]	0.45
Landing Zones 6, 7 and 8 Access Roads	0.62
Multi-Purpose Maneuver Range Perimeter Road	8.93
Explosives Training Range and Access Road	1.55
Surface Radar Tower 1	0.05
Surface Radar Tower 2	0.05

Notes: [1] This analysis assumes a 10-foot wide trench for water lines.
[2] This analysis assumes a 3-foot wide trench for electrical and communication lines.

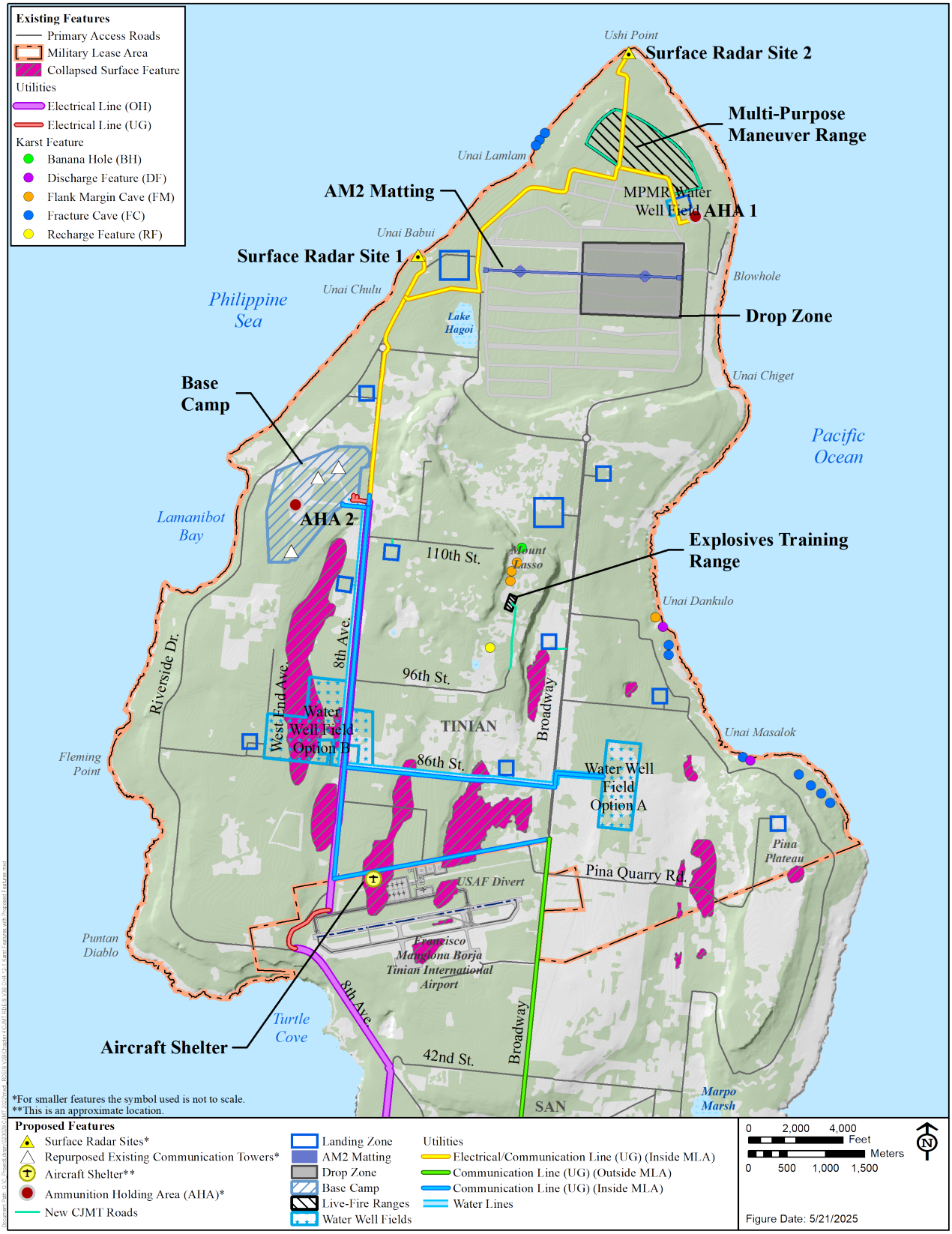


Figure 4.12-1 Karst Features in the Vicinity of the Project Area

Figure 4.12-2 Highly Erodible Soils and Prime Farmland Soils in the Project Area

The Proposed Action would largely avoid disturbance of prime farmland soils in the Military Lease Area, with the exception of a small corner of Landing Zone 8 proposed at a site south of 110th Street at 8th Avenue; portions of Base Camp; the southernmost communications tower; and proposed water line (Figure 4.12-2). The Landing Zone would only require vegetation maintenance and would not involve digging in the soil or the placement of a permanent structure. The Base Camp would utilize existing USAGM infrastructure, including the existing communications tower #16, and require minimal additional soil disturbance in areas of prime farmland soils. The proposed water line alignment north of West End Avenue and connecting to the Base Camp would result in minimal, short-term disturbance of prime farmland soils from trenching during installation. Therefore, there would be less than significant impacts to prime farmland or erodible soils on Tinian under Alternative 1.

4.12.4 Alternative 2

Under Alternative 2, training would continue and would increase over the No Action Alternative by approximately 5 percent, which is approximately 10 percent less than Alternative 1. This would result in less than significant impacts similar to those described under Alternative 1.

Construction for Alternative 2 would be the same as described for Alternative 1. With implementation of management measures, there would be short-term and less than significant impacts to topography, geology, and soils associated with Alternative 2.

4.13 Groundwater and Hydrology

4.13.1 Approach to Analysis

The analysis of potential impacts to groundwater and hydrology focuses on groundwater quantity and quality. Factors used to assess the impacts of the Proposed Action to groundwater and hydrology include: (1) the availability of groundwater to supply the potable water for both the Proposed Action and civilian populations; and (2) the potential for the Proposed Action to impact groundwater quality.

4.13.2 No Action Alternative

Under the No Action Alternative, ground and aviation training events would continue in the Military Lease Area with the same type of activities and at the same tempo as described in previous NEPA documents (DON 2015). In addition, all actions related to the U.S. Air Force Divert Activities project (U.S. Air Force 2016, 2020) would be implemented. No change would occur under the No Action Alternative, therefore, there would be no impact to groundwater or hydrology.

4.13.3 Alternative 1

4.13.3.1 Training

Groundwater Availability

The Proposed Action includes addition of new water infrastructure to support the Base Camp, which would not be connected to the Commonwealth Utilities Corporation water system. This new water infrastructure is proposed to consist of up to four new or rehabilitated groundwater wells, aboveground storage, and a booster pump station. Table 4.13-1 provides the average annual water demand for the new water infrastructure.

Table 4.13-1 Average Annual Water Demands at the Base Camp Under Alternative 1

Description	*Demand*	*Cycles Per Year*	*Persons × Day*	*Unit Water Demand (gpcd)*	*Demand (gallons/year)*
Large Training Group	1,000 persons × 30 days	4	120,000	50	6,000,000
Medium Training Group	250 persons × 14 days	4	14,000	50	700,000
Small Training Group	100 persons × 14 days	10	14,000	50	700,000
Permanent Support Personnel (8-hour shift)	50 persons × 365 days	1	18,250	30	547,500
Portable Vehicle Wash Facility					23,940
				Total	**7,971,440**

Legend: gpcd = gallons per capita per day.

Other uses of potable and non-potable water on Tinian include new wells at North Field (part of the Proposed Action), new wells for the U.S. Air Force, existing agricultural wells operated by the Tinian Mayor's Office, and the potable water supply for the Commonwealth Utilities Corporation. Table 4.13-2 summarizes these demands.

Table 4.13-2 Summary of Average Annual Water Demands on Tinian

Owner	*Facility*	*Type*	*Average Annual Water Demand[2] (gallons per year)*
Military	CJMT Base Camp	Potable	7,971,440
Military	CJMT North Field	Non-Potable	800,000
Military	U.S. Air Force North Field Rehabilitation	Non-Potable	4,380,000
Military	Tinian Divert Infrastructure Improvements	Potable	800,000
Commonwealth Utilities Corporation	Maui Well No. 2[1]	Potable	314,727,702
Tinian Mayor's Office	Well M-21 (CJMT Construction)	Non-Potable	21,600,000
Tinian Mayor's Office	Well M-26 (Existing Agriculture)	Non-Potable	21,600,000

Legend: CJMT = Commonwealth of the Northern Mariana Islands Joint Military Training; No. = number; ; U.S. = United States.
Notes: [1] Average of production at Maui Well No. 2 from 2019 to 2023 and proposed CJMT demands on the Commonwealth Utilities Corporation water system.
[2] Total demand for all the wells.

The total potable and non-potable water demand from existing and proposed uses is approximately 372 million gallons per year. This total water demand has been estimated at 7 to 9 percent of the sustainable yield of the groundwater aquifer, which is approximately 4 to 5 billion gallons per year. As described in Section 3.13, the average annual recharge of Tinian's aquifers is estimated at 20 billion gallons per year. Of this amount, 20 to 25 percent may be sustainably extracted with a broadly distributed network of wells across the island (i.e., 4 to 5 billion gallons per year).

Because the demand from Alternative 1 combined with the current and projected future civilian demand is well below the estimated annual sustainable yield of 4 to 5 billion gallons per year, Alternative 1 would result in a less than significant impact to groundwater availability.

No changes to water usage are proposed for the USAGM site on Saipan. Thus, there are no impacts to groundwater availability on Saipan.

Groundwater Quality

Alternative 1 would result in an increase in the quantity of groundwater extracted to meet water demands during training events. Increased groundwater pumping could potentially lead to saltwater intrusion into the freshwater aquifer, causing chloride concentrations to increase. The Commonwealth Utilities Corporation water system reports that existing chloride concentrations in Tinian's groundwater supply ranged from 145 and 213 milligrams per liter between 2012 and 2023 (Commonwealth Utility Corporation 2013, 2014c, 2015a, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023 and 2024a). This remains below the secondary maximum contaminant level for chloride of 250 milligrams per liter adopted by the CNMI Bureau of Environmental and Coastal Quality for contaminants that are not considered a risk to public health (CNMI Drinking Water Regulations, Chapter 65-20).

To evaluate impacts to chloride concentration in Tinian's groundwater supply from Alternative 1, a groundwater model was prepared evaluating current conditions and four future scenarios, including drought and normal precipitation years. The model assumed an extraction of 21,777 gallons per day of groundwater from the CJMT wellfield A or B (plus Maui Well Number 2 [civilian demand], M-21 [CJMT construction demand], M-26 [agricultural demand], two CJMT North Field wells, the U.S. Air Force Divert well near TNI, and U.S. Air Force North Field well) (Appendix M). The CJMT wellfield demand is based on average demands (including the low, medium and high-intensity training outlined in Table 4.13-1) combined with operational staff and construction personnel. Other assumptions used in the model were that well screens would be set no deeper than 15 feet below mean sea level and pumped at no more than 60 gallons per minute per well. The results of the modeled scenarios predict that chloride concentrations in groundwater at Maui Well Number 2 and either the CJMT wellfield A or B would only negligibly increase due to groundwater withdrawals under Alternative 1.

Construction and operation of each new and existing groundwater well is subject to an annual permit from the CNMI Bureau of Environmental and Coastal Quality. The CNMI Bureau of Environmental and Coastal Quality determines extraction limitations based on the results of pump tests, aquifer recovery tests, and water quality testing. The extraction limitations are subject to change each year based on test results to protect groundwater quality.

The modeled scenarios also evaluated the impact of USMC groundwater withdrawals on the existing Commonwealth Utilities Corporation Maui Well Number 2. The results of the groundwater model demonstrate that the use of the proposed new water system to support construction and training events within the Military Lease Area would have less than significant impacts on water quality at existing Commonwealth Utilities Corporation Maui Well Number 2. Additional detail on the groundwater model is included in Appendix M.

No changes to water usage are proposed for the USAGM on Saipan. Thus, there are no impacts to groundwater availability on Saipan.

4.13.3.2 Construction

Industrial demands during construction would include mixing concrete, earthwork compaction, dust control, hydrostatic pressure testing, and cleaning. The U.S. Air Force is currently constructing the Tinian Divert Infrastructure Improvements at TNI. The contractor purchases all water for that construction from the Tinian Mayor's Office at Well M-21. The CNMI Bureau of Coastal Quality requires annual well testing and sets extraction limits to protect groundwater

quality. Well M-21 has a permitted extraction capacity of 1.8 million gallons per month in 2024 (J. Aldieri, NAVFAC Marianas, Personal Communication, 2024), or 21.6 million gallons per year. All water from this well is used exclusively for construction purposes.

The construction contractors are responsible for obtaining non-potable water used in construction. Construction of the Tinian Divert Infrastructure Improvements would be completed prior to starting construction of the Proposed Action. It is anticipated that the contractors for the Proposed Action would make arrangements with the Tinian Mayor's Office to use Well M-21 for construction water if sufficient water is unavailable closer to the construction site.

The Proposed Action is substantially smaller in size and scope than the Tinian Divert Infrastructure Improvements and would use less water during construction. To be conservative, it is assumed that the same quantity of water, 21.6 million gallons (81.8 million liters) per year, would be used in construction of the Proposed Action. The groundwater model included this demand at Well M-21 in the analysis and there was no impact. Groundwater extraction limits are also set annually based on field testing to protect groundwater quality; therefore, there would be no impacts to groundwater quality from construction.

4.13.4 Alternative 2

The training tempo under Alternative 2 would increase by approximately 5 percent over training already approved to occur on Tinian, which is approximately is 10 percent less than Alternative 1, resulting in a proportional decrease in water use by 10 percent. As a result, the average annual water demand under Alternative 2 would be 7,174,296 gallons per year. This would be a less than significant impact to groundwater availability. Impacts to groundwater quality would also be lower than Alternative 1 and would remain less than significant.

4.14 Surface Waters and Wetlands

4.14.1 Approach to Analysis

This analysis considers Proposed Action impacts to the quality and quantity of surface waters and wetlands within the Military Lease Area as compared to existing conditions. Conditions that may directly affect the quality of surface waters and wetlands include increased pollutant or sediment loads from training and construction. Quantity, defined as the volume of water stored in wetlands, is affected by changes to surface water area, or other physical changes from excavation, adding fill, or expanding impervious surfaces. These changes may result in different drainage patterns or flood susceptibility or effects to hydrology, soils, or vegetation that support a wetland. Note that because there is no proposed training or construction at the former USAGM Saipan site, the site is not included in the analysis.

This analysis assumes that the required National Pollutant Discharge Elimination System Construction General Permit would be obtained before construction activities commence. The National Pollutant Discharge Elimination System Construction General Permit is a key regulatory framework designed to manage stormwater discharges associated with construction activities. Under the Clean Water Act, this permit is mandatory for construction sites that disturb one or more acres of land, requiring operators to implement a Stormwater Pollution Prevention Plan.

4.14.2 No Action Alternative

Under the No Action Alternative, training events would continue in the Military Lease Area with the same or similar type of activities and at the same tempo as described in previous NEPA documents (DON 2010a, 2015b). In addition, because TNI improvements that are part of the U.S. Air Force Divert project would be completed prior to the Proposed Action, the existing environment includes the U.S. Air Force Divert project improvements (U.S. Air Force 2016, 2020). It should be noted that the wetlands, including Lake Hagoi, are currently identified as no training areas under the No Action Alternative. No change would occur under the No Action Alternative; therefore, there would be no impact to surface waters and wetlands.

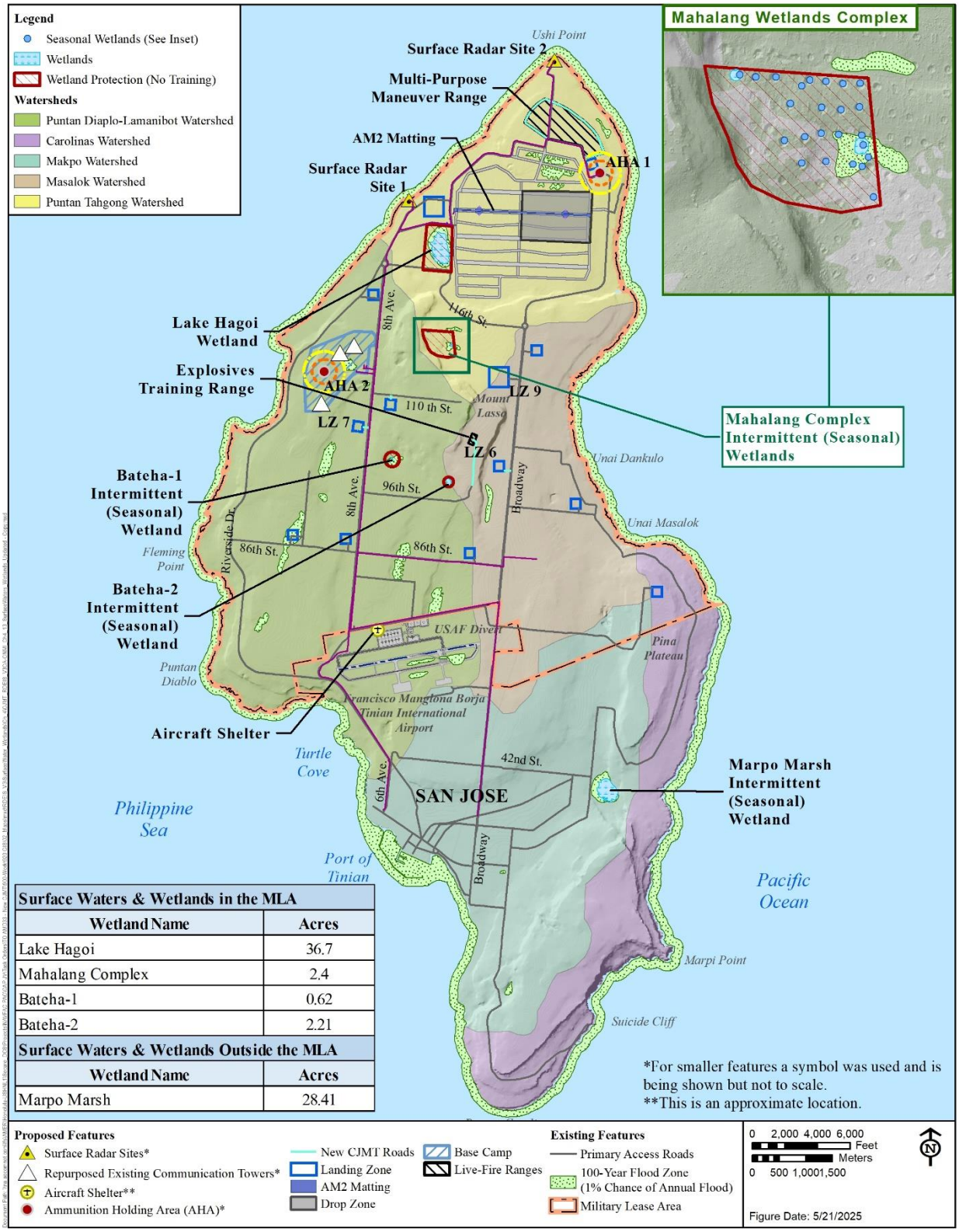
4.14.3 Alternative 1

4.14.3.1 Training

In total, the training tempo under Alternative 1 would increase by approximately 15 percent over training already approved to occur on Tinian under the No Action Alternative. Under Alternative 1, training involving people physically training on foot or in vehicles would avoid the four surface waters and wetlands areas in the Military Lease Area (Figure 4.14-1). Live-fire training operations at the Multi-purpose Maneuver Range and the Explosives Training Range would have the potential to impact surface waters or wetlands by introducing residual heavy metals such as lead into the environment. However, the potential impact is small due to several factors including the relatively large distances between the live-fire ranges and surface waters and wetlands as shown in Table 4.14-1; the generally flat and rolling terrain; and general absence of surface waters and wetlands on Tinian (Figure 4.14-1).

USMC ranges are designed with strict safety measures, including Surface Danger Zones that limit projectile escape to a 1 in 1,000,000 chance. Most projectiles remain near targets due to range design, weapon accuracy standards, and operator qualifications. Even in rare cases where a projectile might leave the immediate target area, natural barriers like vegetation and uneven terrain, along with loss of energy through ricochets and water resistance, substantially reduce the chance of bullets reaching the ocean. As a result, the risk of lead entering ocean waters and affecting water quality is considered extremely low.

To further reduce the risk of introducing heavy metals into surface water or wetland features, upon the conclusion of a training event, units are required to remove all trash, debris, and ammunition dunnage (including bullet casings, packaging, etc.), restoring the land to its original state to the maximum extent possible. Range Control is responsible for ensuring unit compliance for cleanup of the ranges and training areas. The USMC would be responsible for cleaning up after its own activities to the maximum extent practicable, but not for remediating legacy issues in the Military Lease Area, such as World War II-era munitions.



Surface Waters & Wetlands in the MLA	
Wetland Name	**Acres**
Lake Hagoi	36.7
Mahalang Complex	2.4
Bateha-1	0.62
Bateha-2	2.21
Surface Waters & Wetlands Outside the MLA	
Wetland Name	**Acres**
Marpo Marsh	28.41

Figure 4.14-1 Tinian Surface Water and Wetland Features, Flood Zones, and Watersheds

For long-term sustainability of the ranges and training areas, Range Control implements the Operational Range Clearance Program. This program periodically conducts thorough clearances of any remaining ammunition, casings, projectiles, dunnage, and other debris resulting from military activities. Responsibilities and policies regarding the Marine Corps Operational Range Clearance Program must adhere to MCO 3550.12A. Additionally, a Range Environmental Vulnerability Assessment would be conducted one year after the range begins operations and reassessed every five years. This program serves as a proactive and comprehensive approach to ensure the environmental sustainability of USMC operational ranges. It aims to mitigate environmental impacts from active ranges and complies with the requirements outlined in DoD Instruction 4715.14, *Operational Range Assessments*. The application of best management practices would further minimize the possible release of contaminants.

The primary condition that would influence the movement or mobility of lead in an environment is the pH of the soil. The geology of Tinian is predominantly karst, and the soils are derived from limestone bedrock with abundant carbonates and are naturally neutral (pH 6.5–7.0) to alkaline (greater than 7.0). At neutral pH, heavy metals, like lead, become relatively insoluble and the potential for lead to be transported to the ground water or in surface water runoff would be very low (Weil and Brady 2017). Because of the relative scarcity of surface waters on Tinian, best management practices, stormwater management systems, and the natural adsorption of Tinian's soils, training events under Alternative 1 would have less than significant impacts to surface waters and wetlands.

As discussed in Section 4.12 Topography, Geology, Soils, disturbance of soils from training events has the potential to result in increased soil erosion, which may indirectly impact water quality from sediment deposition. Such impacts would be partially minimized by ensuring that all vehicle traffic occur only on new, existing and previously disturbed areas. Additionally, no training is allowed to occur in or near wetlands or Lake Hagoi, as described in Section 4.4 Biological Resources.

While the use of military vehicles and equipment throughout the Military Lease Area would slightly increase the risk for an accidental release of pollutants, as discussed above, training would not take place near any surface waters or wetlands. In addition, were a spill to occur, it would be cleaned up immediately in accordance with the Stormwater Pollution Prevention Plan. As there are no permanent streams on Tinian and the geology is principally karst (i.e., slightly alkaline), should a release occur, the possibility of pollutants traveling more than a few feet overland from the release site is low.

Lastly, best management practices, such as using a sediment basin and/or diversion swales, would be employed to mitigate potential stormwater impacts to surface and nearshore waters and wetlands per the CNMI and Guam Stormwater Management Manual (Horsley Witten Group, Inc. 2006). Through a combination of the unique environment on Tinian (i.e., karst geology) and best management practices, the risk of water quality becoming degraded from training events is less than significant.

Table 4.14-1 Nearest Distances from Surface Waters and Wetlands to Proposed Infrastructure and Training Facilities

From	*To*	*Nearest Distance (feet)*[1]
Bateha-1 Intermittent (Seasonal) Wetland	Landing Zone 7	2,700
	Explosives Training Range	4,400
Bateha-2 Intermittent (Seasonal) Wetland	Explosives Training Range	2,400
	New Road to Explosives Training Range	1,300
Mahalang Complex Intermittent (Seasonal) Wetland	Explosives Training Range	4,900
	Landing Zone 9	2,300
	Base Camp Inhabited Building Perimeter	2,900
Lake Hagoi Intermittent (Seasonal) Wetland	Runway Baker	1,600
	Landing Zone 12	1,000
	Multi-purpose Maneuver Range	10,000
Marpo Marsh Wetland	Landing Zone 1	11,000

Note: [1] Nearest distance measured from closest edge to closest edge in a Geographic Information System and rounded to nearest 100 feet.

4.14.3.2 Construction

Under Alternative 1, impervious surface in the Military Lease Area would increase by approximately 12 acres from the construction of new facilities and other impervious surfaces such as concrete pads or roads resulting in increased precipitation run-off. These new surfaces would be designed to minimize surface water runoff through implementation of low-impact development and best management practices for stormwater management systems as described in Appendix D. In addition, a metal matting surface would be used on North Field to create an 8,000 by 96-foot-wide airfield surface on runway Baker. The AM2 matting would also include 200-foot by 200-foot stakes at each end of the runway to secure the matting. Metal matting would also be installed in an approximately 500 by 500-foot area at Landing Zone 9. This matting is pervious and thus would not increase the area of impervious surfaces.

Under Alternative 1, there would be no placement of fill or excavation of surface waters or wetlands, and construction would occur more than 1,000 feet away from any surface water, wetland, or nearshore waters (Figure 4.14-1 and Table 4.14-1). In addition, use of the already developed USAGM site for Base Camp would reduce the amount of new impervious surfaces required to develop the Base Camp, which would limit additional stormwater runoff from development in that area.

The disturbance of soils during construction activities could lead to erosion and increased sediment in stormwater that could affect surface waters, wetlands, and nearshore waters. The proposed construction activities would minimize runoff through implementation of best management practices for construction, such as silt fences and other stormwater management systems described in Appendix D. In addition, the already disturbed areas within the USAGM site would not introduce new flows that could impact surface waters or wetlands, and stormwater flow in this area is toward the ocean and away from the lake and wetlands. Therefore, given the distance from construction areas to surface waters, implementation of construction best management practices and stormwater management systems, and compliance with the Stormwater Pollution Prevention

Plan and conditions in the National Pollutant Discharge Elimination System Construction General Permit, impacts to surface and nearshore water quality would be less than significant.

4.14.4 Alternative 2

Alternative 2 training would increase over the No Action Alternative by approximately 5 percent, which is approximately 10 percent less than Alternative 1. The training events under Alternative 2 would continue to be located the same distance away from surface waters and wetlands, training would remain restricted away from wetland areas (Figure 4.14-1), and Range Control actions would be the same as Alternative 1. Training under Alternative 2 would not result in any change from Alternative 1 impacts to surface water and wetlands and would be less than significant.

Because there would be no difference in the proposed facilities between Alternative 1 and Alternative 2, construction impacts would be the same for Alternative 2 as described for Alternative 1.

4.15 Cumulative Impacts

Cumulative impacts result when the effects of an action are added to or interact with other effects in a particular place and within a particular time. It is the combination of these effects that is the focus of cumulative impact analysis. While impacts can be differentiated by direct, indirect, and cumulative, the concept of cumulative impacts takes into account all disturbances since cumulative impacts result in the compounding of the effects of all actions over time.

This analysis looks at the cumulative impacts from ongoing and future projects on Tinian and in the CNMI. A future action is considered reasonably foreseeable in this EIS if it is (1) included in a federal, state, or local planning document; (2) likely (or reasonably certain) to occur based on the recommendations of federal, state, or local planning agencies; (3) an existing permit application; or (4) a fiscal appropriation that is likely (or reasonably certain) to occur.

There are a number of planning documents that have been developed by CNMI agencies or are under development, where there is not sufficient detail available related to the implementation plan or timeline for the projects to be considered reasonably foreseeable, such as:

- Comprehensive Integrated Solid Waste Management Plan for the CNMI (2025): Future projects to include Development of Atgidon Landfill (development timeline still in planning stages, with goal to begin operations within 10 years of 2023, to coincide with the closure of the Puntan Diablo Small Community Exempt Landfill); Hardfill Site for Construction and Demolition waste (new planned facility); Recycle Center / Loose Waste Transfer; Recycle Center Expansion; Organics Processing Site – Emergency Green Debris Staging Area.
- Roadway Improvement Plans from CNMI 20-Year Highway Master Plan Final Report (2023): Future projects to include general roadway improvements; near-term recover conditions improvements; long-term (2040) improvements.
- Tinian Harbor Master Plan (2018): 20-year planning period for full build out with the goal to create a flexible terminal layout that can be used for both military and commercial vessel calls. The plan defines projects that could occur in three phases throughout planning period but the timeline for each phase and individual projects have not been fully defined or funded. In July 2023, the Commonwealth Ports Authority Board adopted a Resolution and Letter of Intent for a construction, repair, and maintenance project by the U.S. DoD at the

Port of Tinian. The Letter of Intent is meant to aid the DoD in securing congressional defense authorization funding for the project in the future, and projects that would be anticipated to occur within the next five years are described in Table 4.15-1.

- Ferry Feasibility Study and Transportation Master Plan (under development): Commonwealth Office of Transit Authority was awarded a grant in 2022 to develop a 20-Year Sustainable Transportation Master Plan and conduct an independent ferry feasibility study for the CNMI. Plans would provide/create multi-modal and intra/inter-island transportation options.
- Roadway, grading, and infrastructure improvement projects to be implemented by U.S. Naval Mobile Construction Battalion Detail Tinian (referred to as the Seabees): Since 2020 with the creation of expeditionary Camp Tinian by the Seabees, numerous roadway, grading and infrastructure projects have been conducted in the Military Lease Area. Projects in the community are also implemented when possible, such as the Marpo Heights Road project completed by the Seabees and USMC 7th Engineer Support Battalion in 2022. Future projects and their implementation schedules are in development as practicable.
- Hinemlu Forest Project, DoD Readiness and Environmental Protection Integration Program: The Tinian Mayor's Office is leading a project to rehabilitate a coastal strand and limestone forest trail used for recreation, traditional harvesting, and educational tours. The team will enhance important limestone habitat by removing invasive plants, planting native species, and maintaining fuel breaks in areas prone to wildland fires that destroy forest edges. The trail and habitat enhancement area is adjacent to turtle nesting areas and contains habitat important to many threatened and endangered species.

Specific projects that are currently being implemented or have enough detail to be considered reasonably foreseeable are included in Table 4.15-1. Additionally, the analysis for each resource considers only the present and future actions that could result in potential impacts due to a temporal or geographic overlap with potential effects of the Proposed Action.

Table 4.15-1 Present and Reasonably Foreseeable Future Actions

Reasonably Foreseeable Future Action	*Time Frame*	*Status*
USAGM Closure Actions for Facilities on Tinian and Saipan USAGM would be responsible for the demolition and disposal of communications towers and other infrastructure from the Tinian and Saipan properties. This would include infrastructure not proposed for reuse by the USMC for the Proposed Action described in this Revised Draft EIS.	Current	Ongoing.
U.S. Air Force Agile Combat Employment (ACE) projects at North Field and in the Military Lease Area: • Vegetation clearing and pavement improvements to runway Baker. • Vegetation clearing and pavement improvements to runways Charlie and Dog • Clearing and re-establishment of the boulevard lanes on 8th Avenue and Broadway. This is the west lane of both 8th Avenue and Broadway from the Military Lease Area boundary to the northern roundabout.	Current	Vegetation clearance at North Field runway Baker began in late 2023[5].

Reasonably Foreseeable Future Action	*Time Frame*	*Status*
U.S. Air Force Divert Activities and Exercises • Divert would conduct up to 720 operations (360 landings and 360 take-offs) during up to 8 weeks of the year with up to 265 temporary personnel. These activities would be included in the large training events that are included in the Proposed Action described in this Revised Draft EIS. • Construction underway for an underground fuel pipeline from the Tinian seaport to the Tinian International Airport and construct and operate support infrastructure at the seaport including, if needed, transfer of fuel via tanker truck. Construction anticipated to conclude in 2026.	Current	Record of Decision for Final Supplemental EIS/OEIS signed in December 2022.
Mariana Islands Training and Testing Activities – Ongoing (through 2027) and Future (beyond 2027) • At-sea training and testing activities would continue to occur in the Mariana Islands Training and Testing Study Area as described through 2027.	Future	Record of Decision for Final Supplemental EIS/OEIS signed in August 2020. Marine Mammal Protection Act - Letter of Authorization: valid through July 30, 2027.
Joint Region Marianas Integrated Natural Resources Management Plan (2024) • This plan addresses natural resources management of Navy and former U.S. Air Force holdings and leased lands on Guam, Tinian, and Farallon de Medinilla. Naval Facilities Engineering Systems Command, Marianas is responsible for the management of natural resources covered under this plan. • Reviews for operation and effect are required every 5 years per the Sikes Act, as amended. • The Plan includes a priority list of strategies and projects for natural resources management for a 5-year period.	Current	5-year review for operation and effect of the 2019 Plan completed in early 2025.
Projects in the process of being implemented from the Comprehensive Integrated Solid Waste Management Plan for the CNMI[1] • Conversion of Puntan Diablo current open dump site to a Small Community Exempt Landfill that is permitted to accept municipal solid waste. The project is anticipated to take approximately 5 years to complete. Conversion may include closure of some acreage currently part of the open dump. Once permitted, the Puntan Diablo landfill would be anticipated to operate for no more than 10 years.	Current and Future	Revised draft released for public review through May 2025.

Reasonably Foreseeable Future Action	*Time Frame*	*Status*
Tinian Route 205 Extension Road Improvements[6] • Major siting permit issued by the CNMI Bureau of Environmental and Coastal Quality, Division of Coastal Resources Management in June 2024. • Project area is located at the southside of Tinian, just east of the former Tinian Dynasty Hotel and Casino. • Total length: 0.7 mi, includes paving the existing gravel road from the intersection with Route 206 intersection to Route 27 intersection. • Includes improvements to the drainage system and conveyance to ponding basin, and utility adjustments.	Current	Department of Public Works issued an invitation to bid for this project in February 2025.
Harbor Improvement Projects being Implemented from the Tinian Harbor Master Plan[7] • The Navy's underwater construction teams have been conducting improvements related to these projects on the harbor since 2020. In September 2020, the CNMI Bureau of Environmental and Coastal Quality posted the Consistency Determination and received comments from the Division of Coastal Resources Management Marine Monitoring Team, and Division of Environmental Quality Water Quality Branch. These comments were incorporated into conditions for concurrence of the Consistency Determination. • In 2023, a project involved welding zinc anodes on the port's north quay wall to provide cathodic protection and extend the lifespan of the strategic divert port, which is the only port for both military and commercial craft to access the island. • Additional near-term (e.g., within 5 years) DoD improvement projects in the near term would include additional work on the quay wall, berths 1 and 2, and the roll-on roll-off ramp.	Current	Upcoming DoD improvement projects anticipated to begin in fiscal year 2027 or 2028.

Legend: CNMI = Commonwealth of the Norther Mariana Islands; DoD = Department of Defense; EIS = Environmental Impact Statement; OEIS = Overseas Environmental Impact Statement; Port of Tinian = Honorable Jose Pangelinan San Nicolas Commercial Port of Tinian; U.S. = United States; U.S. Agency for Global Media.

Sources: [1] Office of Planning and Development 2023; [2] Marianas Variety 2023z; [3] Marianas Variety 2023y; [4] Marianas Variety 2022; CNN 2023; [6] Marianas Variety 2022 [7] NAVFAC Marianas 2020, Joint Region Marianas 2023, Saipan Tribune 2023.

4.15.1 Public Access

Both Alternative 1 and Alternative 2 would result in less than significant impacts to public access due to temporary access controls implemented to preserve safety during training events. Development projects such as the improvements to existing roadways around the island of Tinian, and the U.S. Air Force Agile Combat Employment projects at North Field included in the reasonably foreseeable future actions would provide an overall benefit to public access within the Military Lease Area by improving roadway conditions and making the North Field National Historic Landmark more desirable to visit. As a result, the aggregate impacts of reasonably

foreseeable future actions along with either alternative would not result in significant cumulative impacts to public access.

4.15.2 Land Use and Recreation

Proposed training and construction under Alternative 1 and Alternative 2 would have a less than significant impact on land use with successful adoption of new leases and agreements, as these activities would be compatible and consistent with existing land use plans and policies and would not result in changes to land use within or outside the Military Lease Area. Development projects such as the improvements to existing roadways around the island of Tinian (Route 205 by the Tinian Department of Public Works and projects implemented by the U.S. Navy Seabees), and the U.S. Air Force Agile Combat Employment projects at North Field would be consistent with the CNMI Comprehensive Land Use Plan. Additionally, the planned future development of the CNMI's small community exempt landfill at the Atgidon site within the Military Lease Area included in the CNMI Integrated Solid Waste Management Plan would be compatible with proposed military training. Thus, as a result, the aggregate impacts of reasonably foreseeable future actions along with either alternative would not result in significant cumulative impacts on land use.

Both Alternative 1 and Alternative 2 would result in less than significant impacts to recreation due to temporary restrictions during training events. As described for public access above, the development projects included in the reasonably foreseeable future actions listed in Table 4.15-1 draw additional visitors to Tinian and/or improve access to Tinian, which could result in additional visitors to the Military Lease Area. As a result, there may be additional recreational visitors affected by temporary public access restrictions during training events. However, such restrictions would be temporary and access for recreational activities within the Military Lease Area training areas would be maintained where it would be safe to do so while training is occurring. As a result, the aggregate impacts of reasonably foreseeable future actions along with either alternative would not result in significant cumulative impacts on recreation.

4.15.3 Socioeconomics

Temporary activation of surface danger zones in waters north of Tinian during live-fire training at the Multi-Purpose Maneuver Range could significantly affect fishing and boating under the Proposed Action. Military activities that temporarily limit access to popular fishing, recreational, or cultural sites as part of the Proposed Action would be communicated to the public in advance of events to allow time for alternate plans to be made, and Range Control would continue to work with the CNMI and Tinian Municipality to avoid and minimize impacts related to public access within the Military Lease Area, consistent with safety protocols. None of the reasonably foreseeable future actions listed in Table 4.15-1 would have the potential to incrementally increase or exacerbate these potential impacts. If multiple construction projects were to occur simultaneously, a temporary shortage of hotel rooms for workers could occur. Current and reasonably foreseeable projects would have slight impacts on public services due to the associated population increases. Population increases would increase demand for public services such as medical, law enforcement, and firefighting services. These services, particularly medical care, may not be able to manage additional demand adequately during periods of simultaneous project construction. Thus, the aggregate impacts of reasonably foreseeable future actions have the

potential to result in minor cumulative impacts on certain socioeconomic resources and accessibility by residents, businesses, and tourists.

Some of the project listed in Table 4.15-1 would be anticipated to contribute positively to socioeconomic conditions on Tinian, such as the improvements to the Port of Tinian and improved maintenance of the runways and roadways at the North Field National Historic Landmark that would encourage tourism. Indirect beneficial impacts would also likely result from secondary spending from construction workers and military personnel on Tinian as a result of Alternative 1 or Alternative 2. Thus, a cumulative minor to moderate beneficial economic impact would result.

4.15.4 Biological Resources

The Proposed Action includes vegetation clearing, construction, and periodic training activities that could affect terrestrial and marine biological resources, including habitat loss, noise disturbance, and temporary access restrictions. However, with the implementation of best management practices, avoidance and minimization measures, and continued coordination with regulatory agencies under the Endangered Species Act and Marine Mammal Protection Act, these effects would be less than significant. The reasonably foreseeable actions in Table 4.15-1 that involve construction or development, such as the U.S. Air Force's Agile Combat Employment projects at North Field, other roadway improvements that would occur on Tinian are unlikely to impact terrestrial biological resources important to the function of ecosystems, of special public importance, or protected under federal or state law, as they are focused around already disturbed areas such as roadways and the North Field runways. The development and use of the Puntan Diablo site as a permitted Small Community Exempt Landfill and its eventual closure over the next 10 years, would also be unlikely to have a negative impact on terrestrial biological resources, as the open dump currently exists and would be subject to management under the future permitting conditions.

Activities related to the Joint Region Marianas Integrated Natural Resource Management Plan projects and measures as well as current and future training related to the *Mariana Islands Testing and Training EIS/OEIS* have been ongoing in the region and would continue to be implemented in consultation with local stakeholders and regulatory agencies. These processes ensure monitoring and adaptive management would be applied for both terrestrial and marine biological resources on Tinian and in the surrounding waters. Therefore, the aggregate impacts of reasonably foreseeable future actions and either alternative would not result in cumulative impacts on biological resources.

4.15.5 Cultural Resources

The Proposed Action components that would affect the historic runways within the North Field National Historic Landmark include the installation of a temporary airfield surface called AM2 matting, use of mobile aircraft arresting gear, clearing of vegetation to create the proposed drop zone between runways Able and Charlie, and the construction of water wells and tanks along the district's northeast boundary, just south of the Multi-Purpose Maneuver Range. The reuse of the airfield is viewed as consistent with its historical use and the proposed water infrastructure would be designed to have a low profile that would allow it to be screened by existing vegetation and would be painted an inconspicuous color to further blend in with the surrounding landscape. Co-use of the airfield by the U.S. Air Force and the USMC via the activities described above would not result in adverse cumulative effects to the North Field National Historic Landmark or other

adjacent cultural resources and their character-defining features. Range Control would continue to coordinate with the CNMI and Municipality of Tinian to schedule training events in designated training areas within the Military Lease Area, and would provide advance notice of any temporary periods when access controls would be required to preserve a safe separation from the public.

The associated actions with the potential to impact cultural resources are the U.S. Air Force's Divert activities and exercises and the U.S. Air Force Agile Combat Employment projects at North Field and in the Military Lease Area. The U.S. Air Force executed a Programmatic Agreement in 2016 for its Divert Activities, which occurred at and around TNI, resulting in adverse effects to TN-6-0030, West Field. Training and construction under the Proposed Action would not result in impacts to TN-6-0030.

The U.S. Air Force undertaking to conduct projects within North Field and the Military Lease Area, including vegetation clearing and the rehabilitation of runways is undergoing concurrent Section 106 consultation. The U.S. Air Force is proposing to restore the runways to their historical appearance using similar materials, construction techniques, and designs. Thus, the reasonably foreseeable actions described in Table 4.15-1 would not cause additional impacts to cultural resources on Tinian.

The aggregate impacts of reasonably foreseeable future actions along with either alternative would not result in adverse physical, visual, or noise effects and would result in less than significant cumulative impacts to cultural resources.

4.15.6 Visual Resources

The Proposed Action would result in less than significant short-term impacts to visual resources during construction of training infrastructure. Long-term visual impacts from project components such as surface radar towers, live-fire ranges, and Landing Zones are anticipated to be less than significant due to design considerations, minimization measures, and natural screening by vegetation and topography. The U.S. Air Force's Agile Combat Employment projects at North Field is anticipated to provide a cumulative beneficial visual impact by clearing overgrown runways and roadways in and around the North Field National Historic Landmark which would restore the setting to an operational airfield. The other reasonably foreseeable projects described in Table 4.15-1 would occur in already developed areas or on previously disturbed land and roadways that are located outside of the Military Lease Area. Therefore, the aggregate impacts of reasonably foreseeable future actions would result in moderate cumulative impacts on visual resources.

4.15.7 Transportation

The reasonably foreseeable actions in Table 4.15-1 that involve maintenance to roadways would result in a long-term benefit to transportation by improving roadway quality and access to or within the Military Lease Area, such as the Route 205 project and the U.S. Air Force's Agile Combat Employment projects at North Field. With the exception of the projects that would occur at North Field, the majority of the trips would be distributed on the roadway network in the southern portion of Tinian, outside of the Military Lease Area. The training events that would occur under the Proposed Action may overlap and add additional short-term traffic impacts as service members arrive and leave through the TNI and North Field, and the additional trips that would be added during the construction of training infrastructure. There is sufficient capacity on the local roadways

to accommodate these short-term increases. As all roads would continue to operate at an acceptable level of service, the aggregate impacts of reasonably foreseeable future actions would not result in cumulative impacts on transportation.

4.15.8 Noise

The aircraft and live-fire noise impact analysis included a quantitative analysis of potential cumulative impacts from existing operations (baseline) plus each alternative. The results of the modeling include noise contours which depict on a map the different noise levels associated with training-related activities under the Proposed Action (refer to the impact analysis in Section 4.8.3 Noise). Noise from current and ongoing training under the *MITT EIS/OEIS* would remain similar to existing training that occurs in the CNMI. In the future, when large or medium training under the Proposed Action would occur on Tinian, it may coincide with a larger regional training exercise such as those that have occurred in the past (i.e., Cope North or Valiant Shield), and aircraft would follow applicable course rules for using the Mariana Islands Range Complex that dictate where aircraft activity would occur to minimize or avoid impacts to human noise-sensitive receptors on Tinian and Saipan. Construction activities in the southern portion of Tinian south of the Military Lease Area, such as roadway improvements and the U.S. Air Force Agile Combat Employment projects at North Field and in the Military Lease Area comprise the majority of the reasonably foreseeable actions with the potential to contribute to Tinian's noise environment. For the Proposed Action, all activities take place in the Military Lease Area, and, with the exception of infrequent explosives training at the Multi-Purpose Maneuver Range and Explosives Training Range, the Proposed Action would result in a less than significant effect on noise outside the Military Lease Area. Range Control and the USMC would continue to work with the CNMI and Tinian Municipality to avoid and minimize impacts related to training and construction noise. The reasonably foreseeable actions, when considered with the Proposed Action, would not noticeably increase noise levels experienced by sensitive receptors from construction (short-term) or training (long-term) occurring in the Military Lease Area.

4.15.9 Air Quality

The reasonably foreseeable actions in Table 4.15-1 that involve construction or development, such as the U.S. Air Force's Agile Combat Employment projects at North Field, and Route 205 and other roadway improvements that would occur on Tinian have the potential to result in short-term, less than significant cumulative impacts to air quality and greenhouse gas emissions if the emissions were to occur at the same time as a training or any of the associated construction of range infrastructure. Additionally, periodic but also less than significant cumulative impacts to local and regional air quality would be anticipated to result from operational activities, including other military training events included in the *MITT EIS/OEIS* offshore study area. The Proposed Action would result in temporary, localized emissions of criteria air pollutants and greenhouse gases from construction equipment and vehicle use during range development and Base Camp construction, as well as from generators and vehicle use during training activities. These emissions are expected to be intermittent and dispersed. Because of the prevailing winds, phased construction schedule over 10 years, intermittent training events, and distance of the Military Lease Area from populated areas, the contribution of the Proposed Action to cumulative air quality impacts would be minor and less than significant.

The greenhouse gases resulting on a local level contribute cumulatively to global greenhouse gas concentrations that could affect climate. However, these local emission sources make no meaningful contribution to global atmospheric concentration of greenhouse gases.

4.15.10 Public Health and Safety

Under the Proposed Action, the public would continue to be notified regarding which areas of the Military Lease Area that are temporarily closed to avoid health and safety risks from training, and the areas where public access is compatible with military training. The safety zones for the live-fire ranges would be established to further separate the public from any potential hazardous effects from training. The reasonably foreseeable projects in Table 4.15-1 have the potential to beneficially impact public health and safety, including the planned roadway maintenance projects, the U.S. Air Force's Agile Combat Employment projects to clear runways and roadways in and around North Field, and project to convert the current unregulated open dump at Puntan Diablo into a permitted Small Community Exempt Landfill. Therefore, the aggregate impacts of reasonably foreseeable future actions would not result in cumulative impacts to public health and safety or a cumulative impact to the protection of children from environmental health risks or safety risks.

4.15.11 Utilities

The impact analysis for the Proposed Action summarized in Section 4.11 included considerations related to the cumulative activities that would occur on Tinian, which included projects listed in Table 4.15-1. See Appendix M, *Utilities Studies* details the assumptions related to the cumulative projects listed above and how they were incorporated into the analysis. The Proposed Action would install its own potable water wells, and the demand would not create a significant impact on groundwater availability or quality. The development and use of the Puntan Diablo Small Community Exempt Landfill would help to ensure there is sufficient capacity to accept increased levels of municipal solid waste on Tinian. Additionally, the potential management measures developed to minimize potential impacts anticipated from the Proposed Action related to utilities are provided in Table 4.15-2.

Table 4.15-2 Potential Management Measures Related to Utilities

Resource Area	*Potential Management Measure*
Utilities (Solid Waste)	The USMC would develop a solid waste management plan for military operations on Tinian within the Military Lease Area Range Complex and only dispose of waste from military operations in compliant landfills authorized to accept DoD waste.
Groundwater (Water Quality), Public Health and Safety	The USMC would install up to four (4) groundwater monitoring wells at each of the two live-fire ranges and would establish a monitoring plan in collaboration with CNMI Bureau of Environmental and Coastal Quality.
Utilities (Potable Water), Groundwater (Water Availability and Water Quality)	The USMC would fund a one-time hydrogeological study to establish baseline data that could be used to support monitoring of Tinian's aquifer.
Utilities (Potable Water), Socioeconomics	The USMC would provide access to water for ranching needs at its tank dispensing sites.

Legend: CNMI = Commonwealth of the Northern Mariana Islands; DoD = Department of Defense; USMC = U.S. Marine Corps

Therefore, the aggregate impacts of reasonably foreseeable future actions would not result in cumulative impacts on utilities.

4.15.12 Topography, Geology, and Soils

The reasonably foreseeable actions in Table 4.15-1 are unlikely to impact topography, geology, and soils as they primarily involve construction and maintenance in disturbed areas outside of the Military Lease Area. Impacts associated with geological resources have the tendency to be site-specific and do not usually accumulate, other than erosion and sediment deposit. The training infrastructure projects related to the Proposed Action are physically distant from the other reasonably foreseeable projects that involve soil and ground disturbance, and thus, impacts would not be anticipated to overlap. Therefore, the aggregate impacts of reasonably foreseeable future actions would not result in cumulative impacts to topography, geology, and soils.

4.15.13 Groundwater and Hydrology

The Proposed Action would not impact groundwater quantity and quality. The Proposed Action would install its own potable water wells to support personnel during training events, for ongoing operations and maintenance needs, and for firefighting. The analysis in Section 4.13 demonstrated the demand associated with the proposed wells would have no impact on water quality at existing Commonwealth Utilities Corporation Maui Well Number 2. Based on the data collected on historical demand and the resulting analysis from the groundwater study (refer to Appendix M, Utilities Studies), there would be sufficient capacity in the Commonwealth Utilities Corporation to support the reasonably foreseeable projects described in Table 4.15-1. Additionally, the conversion of the Puntan Diablo site into a Small Community Exempt Landfill would have a beneficial impact to protecting groundwater quality compared to existing conditions. The facility would be required to follow applicable permit conditions to retain its status, which may include groundwater monitoring requirements, which are not in place for the current open dump. Therefore, the aggregate impacts of reasonably foreseeable future actions would not result in cumulative impacts to groundwater and hydrology.

4.15.14 Surface Waters and Wetlands

Many of the reasonably foreseeable projects listed in Table 4.15-1 would occur outside of drainage basins where ground disturbance by the Proposed Action would occur. Thus, due to the lack of surface water connectivity between the Proposed Action and the reasonably foreseeable projects, there would be a less than significant potential for cumulative impacts related to surface waters and wetlands.

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5 ADDITIONAL CONSIDERATIONS REQUIRED BY NEPA

This section describes applicable federal and CNMI plans, policies, and controls; irreversible or irretrievable commitments of resources; and the relationship between short-term use of the environment and long-term productivity.

5.1 Consistency with Other Laws

Analysis of environmental consequences shall include a discussion of conflicts between the Proposed Action and the objectives of federal, regional, state, tribal, and local land use plans, policies, and controls. The Proposed Action would be implemented in accordance with all applicable plans, policies, and regulations.

5.1.1 Coastal Zone Management Act Compliance

The Coastal Zone Management Act of 1972 (16 U.S.C. section 1451, et seq.) encourages coastal states to be proactive in managing coastal zone uses and resources. Under the act, federal actions that have an effect on a coastal use or resource are required to be consistent, to the maximum extent practicable, with the enforceable policies of federally approved Coastal Management Plans.

The USMC will submit a consistency determination to the CNMI Division of Coastal Resources Management in the fall of 2025 addressing proposed military training and testing activities that may have a direct or an indirect effect on the CNMI's coastal uses or resources.

5.1.2 Commonwealth of the Northern Mariana Islands Requirements

Land use planning guidance for the CNMI is documented in The Covenant to establish a United States Commonwealth of the Northern Mariana Islands in a Political Union with the United States of America (1976), lease agreements, and the 2019 CNMI Public Land Use Plan. While new agreements or updates to existing leases may be required, the Proposed Action is consistent and compatible with the CNMI Public Land Use Plan, which recognizes the Military Lease Area as used by the military and not publicly available for use, and military training events at the Port of Tinian and TNI. The sections below evaluate consistency and compatibility with local land use plans and leases.

- **1976 Covenant and Technical Agreement.** The Technical Agreement made property available to the U.S. by lease to enable it to carry out its defense responsibilities. As part of the agreements, all shoreline areas in and around the northern two-thirds of Tinian would remain open to anglers at all possible times except for those limited areas that must be closed to comply with safety, security, and hazardous risk requirements from either military activities or commercial activities. In addition, the Covenant assured CNMI residents the same access to beach areas that military personnel and dependents would have, limited only by access restrictions for public safety during times of active military training. During some training events, the public use of certain beaches or areas of the beach would be restricted. The Proposed Action is both consistent and compatible with The Covenant and Technical Agreement.
- **1983 Lease.** The lease agreement is for use of property to carry out DoD defense responsibilities on Tinian. The term of the lease agreement is 50 years, with an option to renew at the sole discretion of the U.S. for an additional 50 years. Under the lease provisions, the

federal government shall have the right to construct, place, erect, or install such buildings, structures, equipment, and facilities as may be necessary. The Proposed Action would construct new structures and would be consistent and compatible with the 1983 Lease.

- **1988 Leaseback Agreement.** The U.S. leased approximately 709 acres for TNI and expansion land north of the airport back to the Commonwealth Ports Authority for use as a public airport. The 1988 leaseback agreement allowed for future military use, future joint use, and modification or termination of the leaseback agreement as necessary to support defense operations. The 1988 Leaseback Agreement was terminated by the 1999 Lease Amendment.
- **1994 Lease Amendment.** The U.S. declared approximately 1,245 acres of lease property south of TNI, including the area surrounding the Port of Tinian, as surplus and moved to dispose of the property. Within the 1994 disposal area, the federal government reserved rights related to the use of San Jose Harbor, the temporary use of surplus land for military training exercises, and the operation of fuel and utility lines between San Jose Harbor and the remaining leased areas. The 1994 lease amendment also expanded the Exclusive Military Use Area by approximately 3,312 acres through the redesignation of Lease Back Area lands north of Dankulo Beach Road. Under the 1994 Lease Amendment (Article 1, Section G), "permanent improvements may be permitted on the Premises with the prior written consent of the U.S." The Proposed Action would continue to use the property for military purposes and is consistent and compatible with the 1994 Lease Amendment.
- **1999 Lease Agreement.** The U.S. terminated the 1988 lease agreement with the Commonwealth Ports Authority and conveyed 709 acres comprising the TNI property and expansion land north of the airport to the CNMI. The 1999 lease agreement also conveyed approximately 645 acres north of TNI, known as the West Tinian Airport Expansion Land, to the CNMI. In addition, the 1999 lease agreement released leasehold interest in 10 acres at Masalok Beach and lands along public rights-of-way within the 1994 Lease Back Area and disposal area. The Proposed Action does not change the conveyance or use of these lands and is consistent and compatible with the 1999 Lease Agreement.
- **1999 Conservation Agreement.** Concurrent with the 1999 lease agreement, the U.S. and the CNMI agreed to preserve approximately 970 acres of Lease Back Area lands for wildlife conservation for the Tinian monarch. In accordance with the Conservation Agreement, and as stated in the U.S. Fish and Wildlife Service Biological Opinion 1-2-98-F-07, the military retains the right to use the Natural Resource Conservation Area for low impact, non-habitat-destructive military training. The Proposed Action includes an access road to the Explosives Training Range, two Landing Zones, and associated access roads within the Conservation Agreement land. The USMC will coordinate with the U.S. Fish and Wildlife Service on this use. The Biological Opinion will ensure the Proposed Action is consistent and compatible with the 1999 Conservation Agreement or will require a new agreement.
- **2019 Lease Agreement.** The U.S. and the Commonwealth Ports Authority entered into an agreement for the lease of real property at and adjacent to TNI and at the Port of Tinian. This agreement supports implementation of the Pacific Air Forces Divert project. Although this lease includes areas covered by previous lease agreements, this lease does not change, amend, or otherwise alter the 1983 Lease or its amendments. It includes non-exclusive use of taxiways

at TNI and easement areas for construction and utilities. This lease was amended in 2023 to correct mutual mistakes in delineation of utility and access easements. The Proposed Action would continue to use TNI for military purposes and is consistent and compatible with the 2019 Lease Agreement.

- **2019 CNMI Public Land Use Plan.** The Plan provides guidance for the efficient and effective services in the management, use, disposition, and development of lands outside the Military Lease Area for the economic and social betterment of the CNMI. The Plan is organized in a format that describes the existing conditions of the CNMI, provides a socioeconomic forecast with recommendations for the future and updated Geographic Information Systems map. Because the Proposed Action would occur only on military leased lands that are outside the scope of the CNMI Public Land Use Plan, and would provide an economic benefit for Tinian, the Proposed Action is consistent and compatible with the 2019 CNMI Public Land Use Plan.
- **2023 Lease Amendment.** The U.S. and the CNMI signed an administrative amendment to the 1983 agreement. The administrative amendment clarified that the U.S. retains, "the right to the reasonable use of roadways as well as the right to improve, construct, maintain and repair roads and utilities owned by the Commonwealth including all supporting facilities and structures." Under the amendment, the CNMI government, "reserves the right to construct improvements including additional roads and utility lines and pipelines and to grant additional non-exclusive easements and rights-of-way on, in, under, across, through and over the easement areas as it shall determine to be in the public interest, provided that the Commonwealth shall consult with the U.S. prior to granting any such easements and obtain written concurrence of the U.S. that any such additional grants are not inconsistent with the use of the affected easement area by the U.S." The Proposed Action would provide a benefit to Tinian through improvement of roads and expansion of utilities. Improvements or easements and rights-of-way in areas designated for military use would be coordinated with the USMC. With this provision, the Proposed Action is consistent and compatible with the 2023 Lease Amendment.

CNMI regulations for protection of human health and the environment are listed in Appendix E and include provisions for threatened and endangered species, historic preservation, air quality, drinking water, solid waste, and wastewater. The Proposed Action would comply with all applicable Commonwealth requirements and is consistent with continued military use in the Military Lease Area.

5.2 Irreversible or Irretrievable Commitments of Resources

NEPA requires that environmental analysis include identification of "any irreversible and irretrievable commitments of federal resources which would be involved in the Proposed Action should it be implemented" (42 U.S.C. section 4332). A commitment of resources is irreversible when the effects of proposed activities result in limiting the future options for resource development or effects of proposed activities involve a loss, generally of a non-renewable resource. Irretrievable is a term that applies to the loss of production, harvest, or use of natural resources. For example, if farmland is used for a non-agricultural event, some or all of the agricultural production from an area of farmland is lost irretrievably while the area is temporarily used for another purpose. The production lost is irretrievable, but the action is not irreversible.

Under the No Action Alternative, current military training events would continue. Under Alternative 1, training would continue and would increase over the No Action Alternative by approximately 15 percent. Under Alternative 2, training would continue and would increase over the No Action Alternative by approximately 5 percent, which is approximately 10 percent less than Alternative 1. Implementation of Alternative 1 or Alternative 2 would involve construction activity that would involve clearing and grading impacting natural resources and the expenditure of labor and the consumption of fuel, oil, and lubricants. Consumption of fossil fuels, for construction and training, along with funds used for construction and training are irreversible and irretrievable. The clearing and maintenance of vegetation, use of training areas, and construction of new roads and buildings are neither irreversible nor irretrievable.

5.3 Relationship Between Short-Term Use of the Environment and Long-Term Productivity

NEPA requires an analysis of the relationship between a project's short-term impacts on the environment and the effects these impacts may have on long-term productivity of the affected environment. Impacts that narrow the range of beneficial uses of the environment are of particular concern. This refers to the possibility that choosing one alternative reduces future flexibility in pursuing other options, or that designating a parcel of land or other resource for a certain use eliminates the possibility of other uses being performed at the site.

Short-term uses of the environment associated with the Proposed Action include changes to the physical environment and energy and utility use during construction associated with Alternative 1 or Alternative 2. Construction activities would involve short-term increases in fugitive emissions and construction generated noise and would increase the use of fossil fuels to provide power to equipment. Construction would result in temporary disturbance to terrestrial wildlife, including federally listed species. Construction would also result in temporary disturbance of cultural resources, including the North Field National Historic Landmark. The short-term use of resources would not be expected to affect long-term productivity. Public access would also be controlled to some areas while training events are taking place. However, the Proposed Action includes eight subdivided training areas to minimize restrictions and avoids agricultural grazing uses.

Long-term changes would include alteration to topography and soils from construction. Permanent effects may include removal of terrestrial habitat and construction of new structures within or adjacent to cultural resource sites. Long-term changes would also include continued maintenance of vegetation for training events at North Field, live-fire ranges, radar towers, Landing Zones, and the Base Camp. However, these long-term impacts are not expected to affect long-term biological productivity or the listing or eligibility of historic resources.

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6.5.16 Chapter 5

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8 DISTRIBUTION LIST

Chapter 8 provides a list of parties who were directly notified about a Notice of Availability of the Revised Draft Environmental Impact Statement. The Notice of Availability indicates when the Revised Draft EIS was issued, where copies may be obtained or reviewed, the duration of the comment period, where comments may be sent, and the location, date and time of public meetings. Private citizens may receive a Notice of Availability, but their names are not included in the list. Also included is a list of libraries receiving an electronic copy on compact disk or hard copy of the Revised Draft EIS.

8.1 Parties Receiving Notice of Availability of the Revised Draft Environmental Impact Statement

8.1.1 Elected Officials – CNMI

Office of the Governor of the CNMI, The Honorable Governor Arnold I. Palacios

Office of the Lt. Governor of the CNMI, The Honorable Lt. Governor David M. Apatang

U.S. House of Representatives, The Honorable Representative Kimberly King-Hinds

Mayor of Tinian and Aguiguan, The Honorable Mayor Edwin P. Aldan

Mayor of the Northern Islands, The Honorable Mayor Valentino Taisacan

Mayor of Saipan, The Honorable Mayor Ramon "RB" Jose Blas Camacho

Mayor of Rota, The Honorable Mayor Aubry Manglona Hocog

CNMI Senate

CNMI House of Representatives

8.1.2 Federal Agencies

Advisory Council on Historic Preservation

Department of the Air Force

Department of the Army

Department of Army, U.S. Army Engineer District, Honolulu, Regulatory Branch

Federal Aviation Administration

Naval Facilities Engineering Systems Command, Headquarters

Naval Facilities Engineering Systems Command, Pacific

National Oceanic and Atmospheric Administration, National Marine Fisheries

U.S. Department of Agriculture, Natural Resources Conservation Service

U.S. Department of the Interior, National Park Service

U.S. Department of the Interior, Office of Insular Affairs

U.S. Environmental Protection Agency, Region 9

U.S. Fish and Wildlife Service, Pacific Islands Office

U.S. Navy Commander, Joint Region Marianas

U.S. Navy Commander, Pacific Fleet

U.S. Navy, Joint Guam Program Office

8.1.3 CNMI Agencies

CNMI Bureau of Environmental and Coastal Quality, Division of Environmental Quality and Division of Coastal Resources Management

CNMI Office of Planning and Development

Commonwealth Bureau of Military Affairs

Commonwealth Ports Authority

Commonwealth Utilities Corporation

Department of Community and Cultural Affairs, Historic Preservation Office

Department of Lands and Natural Resources

Division of Fish and Wildlife

Department of Public Lands

Department of Public Works

Marianas Visitors Authority

Office of Military Liaison and Veterans Affairs

Western Pacific Region Fisheries Management Council

8.2 Libraries Receiving Hard Copy

Joeten Kiyu Public Library, Saipan

Tinian Public Library

Rota Public Library