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SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT (SEIS) FOR A  
**LIVE-FIRE TRAINING RANGE COMPLEX (LFTRC) AND MAIN CANTONMENT  
AND FAMILY HOUSING LOCATION ON GUAM**

## Preferred Alternatives: What are the Combined Impacts?

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## 2014 Draft SEIS Summary of the Preferred Alternatives

The purpose of the Draft (SEIS) is to determine if a proposed action may significantly affect the quality of the human environment. The purpose of the construction and operation of the cantonment/ family housing and LFTRC facilities is to support the relocation of 5,000 Marine soldiers and their 1,300 dependents to Guam. This document summarizes the impacts of the preferred alternatives while also presenting the additive impacts when combined.

## What is a Preferred Alternative?

According to the Council on Environmental Quality (CEQ), the preferred alternative is the alternative that is believed to best fit the mission and responsibilities, while giving consideration to economic, environmental, technical and other factors. The alternatives described in the 2014 Draft SEIS were analyzed to see how they impacted 18 environmental resource areas. Based off of those impacts a preferred alternative was then chosen: Alternative A for the cantonment / family housing located at Finegayan, and Alternative 5 for the LFTRC located at the Northwest Field (NWF). The preferred alternatives chosen consist of the combination which best meets both the operational requirements for size and layout, has the maximum use of federal land, and is the most efficient due to the close proximity of the facilities.

## 18 Environmental Resource Areas Evaluated for Impacts in Each Alternative

1. Geological and Soil Resources
2. Water Resources
3. Air Quality
4. Noise
5. Airspace
6. Land / Submerged Land Use
7. Recreational Recourses
8. Terrestrial Biological Resources
9. Marine Biological Resources
10. Cultural Resources
11. Visual Resources
12. Ground Transportation
13. Marine Transportation
14. Utilities
15. Socioeconomic and General Services
16. Hazardous Materials and Waste
17. Public Health and Safety
18. Environmental Justice and the Protection of Children



For more detailed information on the topics presented here, please refer to the 2014 Draft SEIS, which is available for review at the Robert F. Kennedy Memorial

Library, located in the University of Guam, and the Nieves M. Flores Memorial Library in Hagåtña. The 2014 Draft SEIS can also be viewed online and downloaded at the websites listed below.

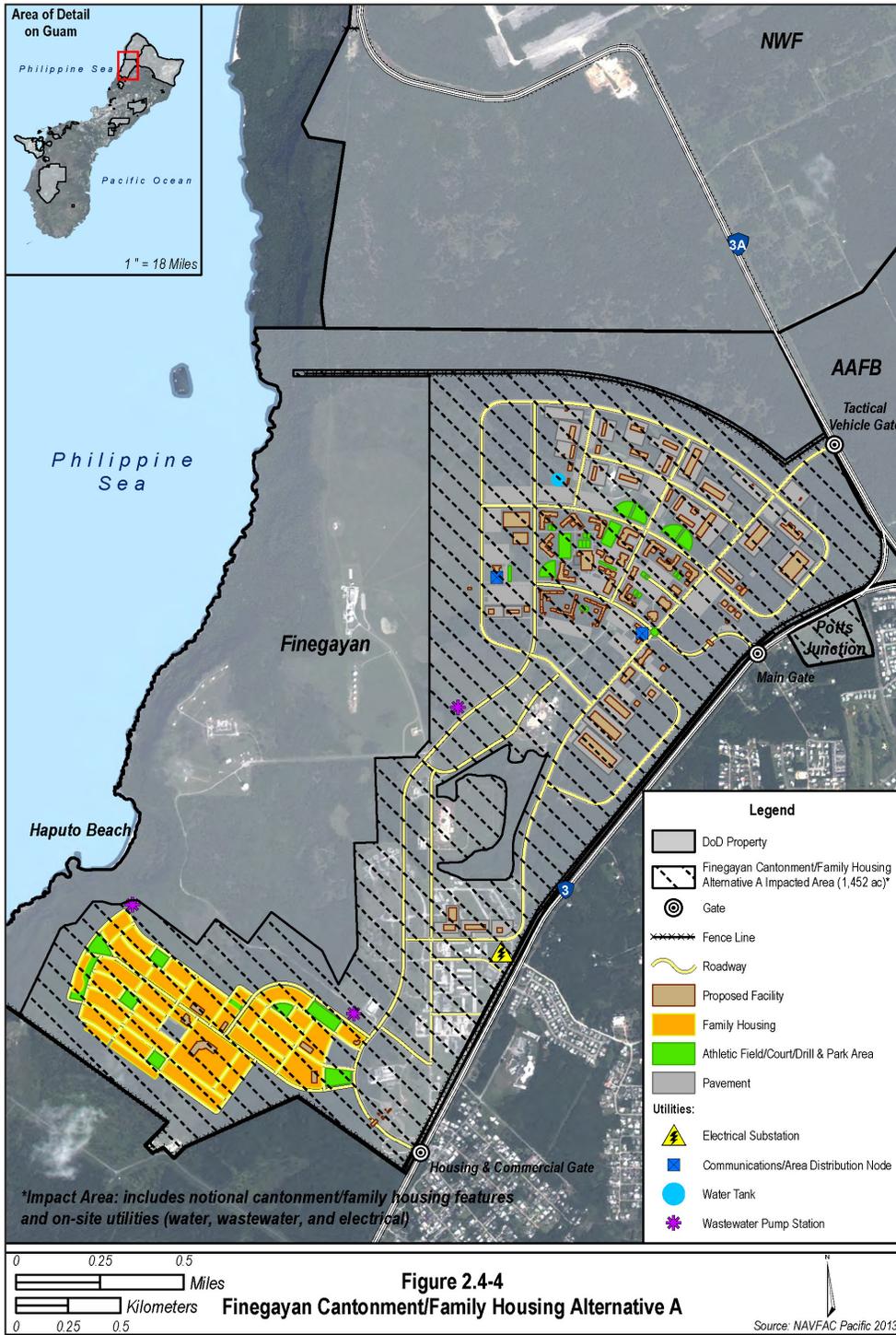
Download the complete Draft SEIS and related documents at these websites:

JGPO: [www.guambuildupeis.us](http://www.guambuildupeis.us)  
GovGuam: [www.one.guam.gov](http://www.one.guam.gov)



# Preferred Alternatives: What are the Combined Impacts?

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## Cantonment / Family Housing Alternative A at Finegayan

### Why Preferred?

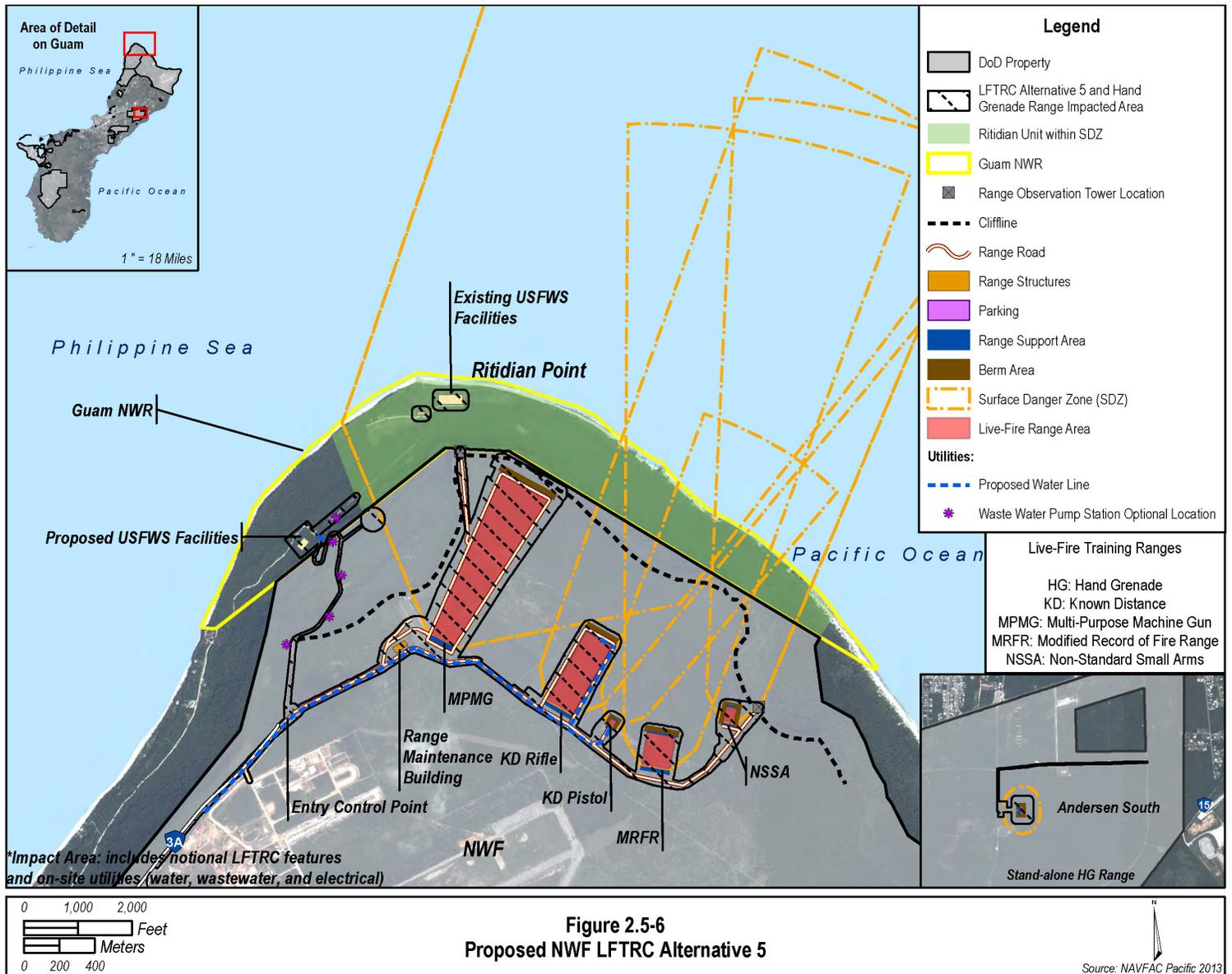
**No Land Acquisition Required.** The site is a 1,452-acre single adjoining parcel of federally owned land.

**Fewer Topographic Impacts.** This alternative would have the second lowest amount of excavation volume. The site does not involve major elevation changes or alterations to the surrounding landscape and geological features.

**Efficient Site Layout.** A design concept has been developed to support high density development in a pedestrian friendly environment. The same concept would help create a balance between the working, living and recreation areas.

**No Further Restrictions to Public Access.** There are no significant impacts to land use, therefore eliminating the need for any new restrictions on public access.

**Uses Existing Utility Easements.** The buried electrical communications, water, and wastewater lines mostly run along the roadway corridors for Routes 3 and 9 to connect the on-base infrastructure to existing utility networks. Land has been set aside for protection of the existing communication lines which can be left undisturbed during and after construction.



## LFTRC Alternative 5 at Northwest Field (NWF) Why Preferred?

**No Land Acquisition Required.** None of the 3,981 acres in this alternative is privately owned. It is under custody of the Department of the Interior (DOI).

**Construction Impacts Mitigable with Best Management Practices (BMPs).** Construction of the 5 individual ranges would impact over 265 acres including access roads, perimeter fencing, etc.

However, BMPs would be implemented to ensure compliance with range policies and procedures. Quarterly inspections will ensure the BMPs are in place.

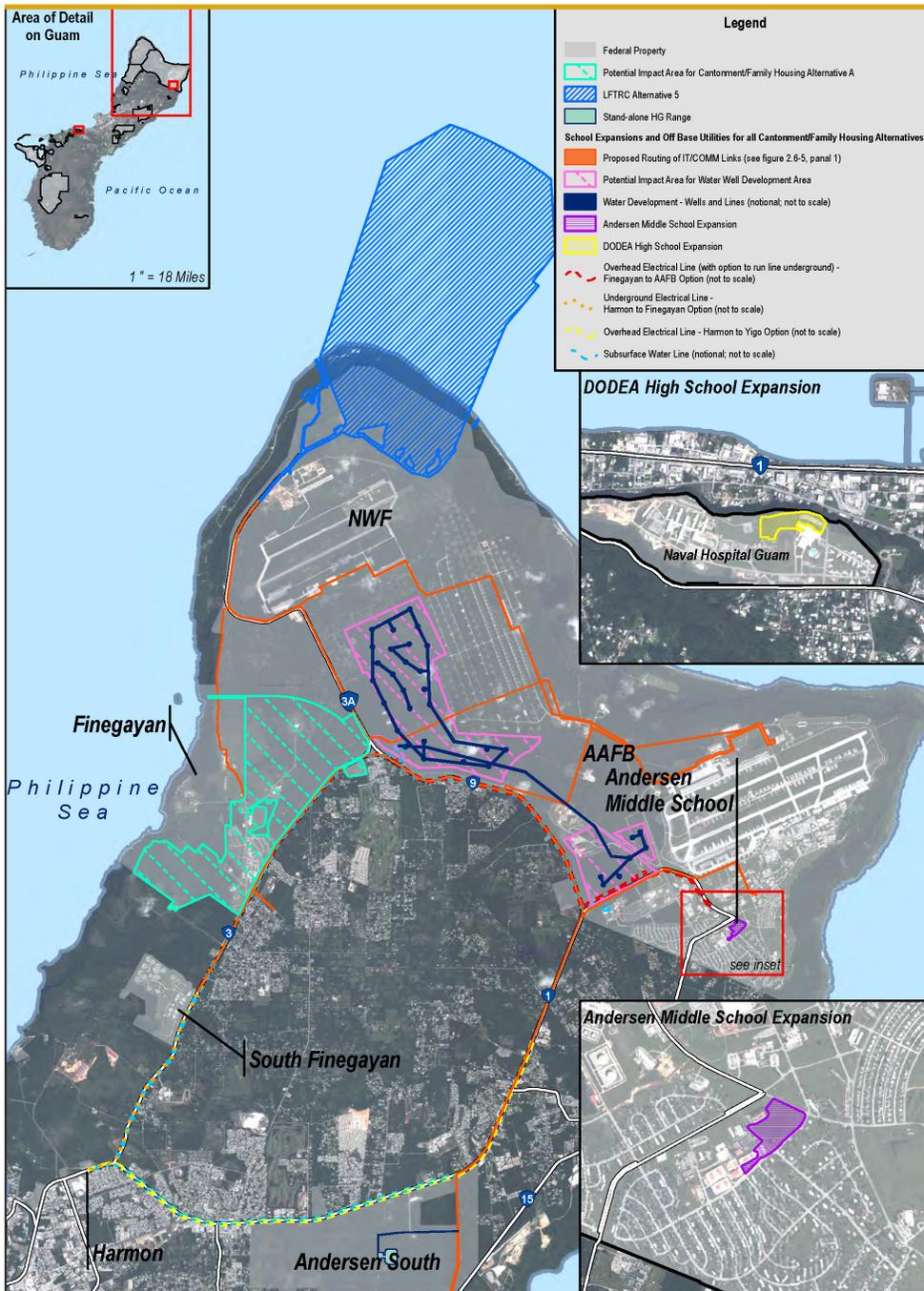
**Potentially Fewer Topographic Impacts.** Construction of the ranges involves a large amount of excavation volume. However, if existing U.S. Fish and Wildlife Services (USFWS) facilities were demolished, those surface elevations would not need to be changed, allowing for a less significant impact on the topography.

**Minimal Access Restrictions.** For safety reasons public access to the Guam National Wildlife Refuge within the Ritidian area would be restricted during range use. In addition to new restrictions on submerged lands near Tarague and Jinapsan Beach, passes will be given to individuals and vehicles to allow access to those properties.

## What is Considered an Impact to the Environment?

The following are potential projects that would be considered an impact on the 18 environmental resource areas. GovGuam will review mitigation proposals from the Department of Defense (DOD) and other agencies through the consulting phase to minimize these impacts.

- Loss of native habitat that would reduce potential recovery and survival of species.
- Projects that would cause a disturbance such as construction, renovations, and improvements.
- Projects that affect historic properties causing a loss for archaeological and built historical records.
- Projects that damage culturally important natural resources.
- Projects that lead to an increase in restricted access to cultural sites.



## Cantonment / Family Housing Alternative A at Finegayan

### Environmental Impacts

Of the 5 alternatives considered in the 2014 Draft SEIS including the No-action alternative, Alternative A at Finegayan has the fewest impacts overall. However, there are expected to be significant to moderate impacts to 6 of the 18 environmental resource areas evaluated in the 2014 Draft SEIS: terrestrial and marine biological resources, water resources, cultural resources, utilities, socioeconomic, and environmental justice.

## LFTRC Alternative 5 at Northwest Field (NWF)

### Environmental Impacts

Of the 6 alternatives considered in the 2014 Draft SEIS including the No-action alternative, Alternative 5 at Northwest Field would have significant to moderate impacts to 4 of the 18 environmental resource areas: geological and soil resources, land and submerged land use, terrestrial biological resources, and cultural resources.

## Best Management Practices (BMPs)

Regardless of the alternative considered, the proposed action would include the implementation of BMPs to proactively reduce, minimize, or avoid impacts. BMPs are existing policies, practices, and measures required by law, regulation, or DOD policy that reduce the environmental impacts of designated activities, functions, or processes. BMPs are distinguished from mitigation measures because BMPs are (1) existing requirements for the proposed action, (2) ongoing, regularly occurring practices, and (3) routinely applied to the type of construction proposed. In other words, the BMPs identified in the Draft SEIS are inherently part of the proposed action and are not additional mitigation measures proposed in response to the NEPA environmental review process for the proposed action. The application of BMPs is, however, factored in to the environmental impact analysis for each resource category and may influence the conclusions resulting from such analyses.

## Impacts and Mitigation Measures for the Preferred Alternatives

When combined, the preferred alternatives for the cantonment / family housing and the LFTRC significantly impact 7 of the 18 environmental resource areas evaluated in the 2014 Draft SEIS. The table on the following pages describes these impacts and the mitigation measures recommended by the Department of the Navy (DON).

Impacts		Mitigation Measures	
<b>Impacts to Geological and Soil Resources - LFTRC Preferred Alternative 5</b>			
<b>Topography</b>	Due to major changes in surface elevation there would be significant impacts to the geological and soil resources. Storm water improvements would be included in the proposed action.		If the existing USFWS facilities are demolished, existing elevations would not have to be changed as drastically, allowing for a less significant long-term impact.
<b>Impacts to Water Resources - Cantonment / Family Housing Preferred Alternative A</b>			
<b>Groundwater / Potable Water</b>	 Cantonment operations would bring long-term significant impacts to annual groundwater production. An increase to 1.7 million gallons withdrawn per day would cause localized impact to the Northern Guam Lens Aquifer (NGLA). Increased amounts of withdrawal from the NGLA could result in higher levels of chloride concentrations.	The DOD will implement enhanced water conservation measures to improve existing water systems on their property. This will assist in reducing system leaks, adjust pumping rates and increase the use of surface water in northern Guam from the Fena Reservoir.  By adhering to General Permit and BMP regulations during construction, there would be a reduced potential for stormwater pollutants to the underlying groundwater sub-basins of the NGLA.	
<b>Nearshore Water</b>	Direct impacts to nearshore waters are significant but mitigable. Along with the already existing Haputo, Ecological Reserve Area (ERA) Management Plan required buffer zones, the immense vegetation will provide sufficient buffering and protection from stormwater runoff.  The projected increase in wastewater flow during construction and operation would result in direct significant impacts to Nearshore Water until upgrades to the Northern District Wastewater Treatment Plant (WWTP) are completed.	An environmental and hydrogeological assessment will be performed to ensure adverse effects would not result, such as: <ul style="list-style-type: none"> <li>• Displacement of ground water</li> <li>• Interference with well production</li> <li>• Significant changes to groundwater recharge</li> <li>• Flooding</li> <li>• Threat of any pollutant to groundwater</li> </ul>	
<b>Impacts to Land and Submerged Land Use - Cantonment / Family Housing Preferred Alternative A</b>			
<b>Public Access</b>	LFTRC operations would result in a significant impact to public access to the Ritidian Unit of the National Wildlife Refuge (NWR) in the form of access restrictions to the land and submerged lands within the Surface Danger Zones (SDZ).  For safety reasons, public access to submerged lands would be limited to the SDZ minimum area and during any period of use by the LFTRC due to the training schedule.		The DON would coordinate with the USFWS to ensure that the portion of the SDZ overlaying the Ritidian Unit is compatible with the purposes of the NWR. Access restrictions would be limited to the minimum SDZ area and period of use required for the LFTRC.

## Preferred Alternatives: What are the Combined Impacts?

Impacts		Mitigation Measures
<b>Impacts to Terrestrial Biological Resources - LFTRC Preferred Alternative 5 and Cantonment / Family Housing Preferred Alternative A</b>		
<b>Vegetation</b>	<p>Construction overall would cause a loss in vegetation due to development along with the destruction of conservation areas.</p> <ul style="list-style-type: none"> <li>Alternative A would result in a loss of 1,250 acres of conservation property, including 1,020 acres of vegetation.</li> <li>Alternative 5 would result in a loss of 201 acres of vegetated land which would be developed along with 255 acres of Overlay Refuge lands (conservation areas).</li> </ul> <p>Operational impacts for Alternative A would result due to the increased use of the Haputo ERA, but mitigations are available.</p>	 <p>To mitigate for significant impacts to the limestone forest, enhancements would include but are not limited to the following.</p> <ul style="list-style-type: none"> <li>Improve the overall habitat quality for native flora and fauna</li> <li>Ungulate management consisting of exclusion fencing and active control with the goal of eradication within the fenced areas.</li> <li>Non-native, invasive vegetation removal.</li> <li>Propagation, planting, and establishment of dominant and rare species that represent characteristics of the areas habitats.</li> </ul>
<b>Conservation Areas</b>	<p>Construction would result in significant but mitigable impacts to conservation areas due to the conversion of 255 acres of Overlay Refuge lands into a developed area. Cantonment operations would result in significant impacts to the Haputo ERA due to increased usage by military and civilian personnel.</p>	<p>Designate Naval Magazine (NAVMAG) ERA, expand of Orote Peninsula ERA. Introduce fencing, educational signage, educational materials regarding area biological resources, and monitoring of visitor use.</p>
<b>Impacts to Cultural Resources - LFTRC Preferred Alternative 5 and Cantonment / Family Housing Preferred Alternative A</b>		
<b>Culturally Significant Properties / Sites</b>	<p><b>LFTRC Preferred Alternative 5</b></p> <p>General Impacts would affect twenty sites and undetermined effects to one unevaluated site from development for Alternative 5.</p> <p>Construction impacts would include vegetation and soil removal, while operational impacts restrict access to two archaeological sites and three sites would change in utilization which would degrade the sites integrity.</p> <p><b>Cantonment / Family Housing Preferred Alternative A</b></p> <p>General impacts would involve direct affects to 24 sites and undetermined affects to ten buildings.</p> <p>Operational impacts would include indirect effects to one National Register of Historic Places (NRHP) site due to increased recreational use.</p>	  <p>Any significant impacts can be avoided or minimized during the planning process. Access restrictions would be considered for individual's safety and security. 2011 PA would also include a public process to share information, consider views of the public, and develop mitigation measures such as:</p> <ul style="list-style-type: none"> <li>Identifying other possible properties</li> <li>Consulting with concurring parties</li> <li>Data recovery to develop an appropriate mitigation plan</li> <li>Mitigation reports to be submitted to State Historic Preservation Office (SHPO) for final review</li> <li>Educational materials to notify the public of the projects and their alternatives</li> <li>Enforce construction mitigation measures.</li> </ul>
<b>Impacts to Utilities - LFTRC Preferred Alternative 5 and Cantonment / Family Housing Preferred Alternative A</b>		
<b>Wastewater Treatment</b>	 <p>The existing waste waters systems at Finegayan are incapable of meeting the increased demand from the proposed action. Additionally, the Northern District WWTP is non-compliant with secondary treatment standards required by its permit. The projected increase in wastewater flow during construction and operation would result in direct significant impacts to Nearshore Water until upgrades are completed.</p>	<p>The DOD proposes to assist the Guam Waterworks Authority (GWA) to locate funding for WWTP upgrades, and in part develop an implementation plan to assist with public infrastructure improvements which are needed to sustain the alternative. The system would connect to the GWA collection system along Route 3 through a relief sewer.</p> <p>\$106,400,000 has been appropriated for civilian water and wastewater improvements on Guam. Specific projects utilizing these funds will be coordinated with the Economic Adjustment Committee (EAC).</p>
<b>Electrical Power</b>	<p>There would be no significant direct long-term impacts to the current power customers, with only potentially short-term power outages during construction of the expanded system. Scheduled outage notices would be provided a minimum of 30 days in advance.</p>	<p>By using temporary generators, the potential for these power outages would be minimal. Scheduled outage notices would be provided a minimum of 30 days in advance.</p>
<b>Solid Waste Services</b>	<p>Population increases will increase the need for solid waste services along with the total cost of providing services.</p>	<p>Because increased costs will be spread over a larger group of ratepayers, rates will be little changed as a result of the proposed action.</p>

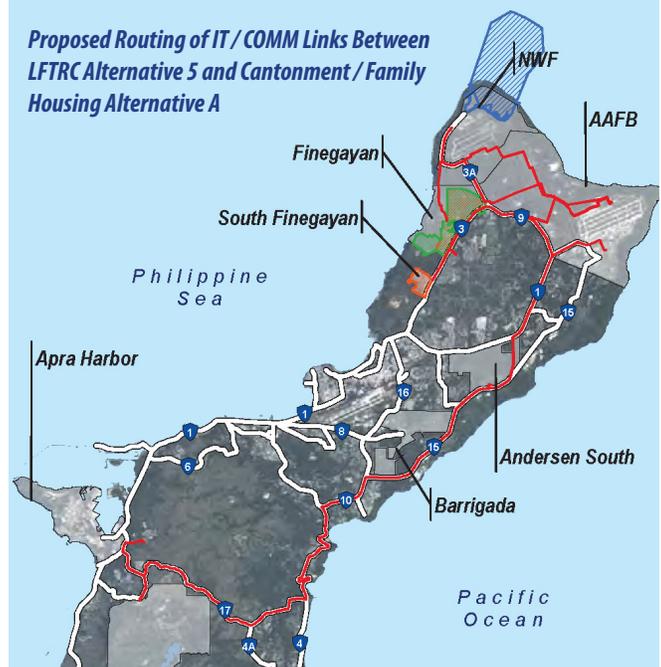
Impacts		Mitigation Measures
<b>Impacts to Socioeconomics and General Services</b>		
<b>Population Change</b>	The population change due to the relocation would be significant during the construction and operational periods and is estimated to be 5.6% higher than without the proposed action. At a steady state the population increase would be at a 4.1%.	These changes are not necessarily negative and may have beneficial outcomes, such as increased tax revenues. Therefore no mitigation is proposed.
	Taking into consideration the predictable natural increase in Guam's population, as well as the projected increase in military personnel and their dependents, the total population should increase from the current 159,358, recorded by the U.S. Census, to approximately 175,436 by 2028.	The DOD will continue to support the Civilian Military Coordination Council (CMCC) to develop appropriate recommendations regarding construction sequencing. This will directly influence the workforce population levels.
<b>Public Services</b>	During construction all public service agencies would require an estimated additional 130 employees which would create a 2.9% increase in baseline staff levels. This would be a short term effect lasting from 2021 to 2023. A total of 14 agencies would be significantly impacted by Guam's population increase.	CMCC forecasting would identify the shortfalls in Guam public services and assist in locating federal programs and funding sources to support any shortfalls before public service capabilities are exceeded.
<b>Sociocultural Issues</b>	Because the magnitude of the impacts could vary substantially, impacts to sociocultural issues are conservatively classified as significant. 	<ul style="list-style-type: none"> <li>• Conduct orientation briefings for all incoming personnel, their families, and contractors regarding cultural sensitivity in the area.</li> <li>• Develop construction sequencing to influence workforce population levels in an effort to minimize sociocultural impacts.</li> <li>• A \$12,000,000 appropriated for a Guam Cultural Repository facility remains and serves as a source of information on Guam history and culture.</li> </ul>
<b>Impacts to Environmental Justice and Protection of Children</b>		
<b>Socioeconomics</b>	Temporary population growth may stress certain sectors of the Guam economy, and short term impacts to health services would be significant, particularly on low-income populations. However some benefits would occur due to increased employment opportunities.	Support from the DOD in providing project-related employment, population forecasts to help identify shortfalls in Guam's public services, and assistance in identifying federal programs and funding sources that would help GovGuam to address shortfalls.
<b>Public Health and Safety</b>	The number of public health and safety professionals required to maintain current levels of service would increase by more than 2%. When considering the current level of service, with the existing deficiencies in facilities, equipment, and staffing, there would be potential significant impacts to public health and safety agencies, and the low income populations they serve, during construction and beyond.	Potential mitigations would be the same as previously described under public services along with an appropriated \$13,000,000 for a regional public health laboratory by the FY2014 Consolidated Appropriations Act.

## Significant Additive Impacts of the Preferred Alternatives

Additive impacts are the combined construction and operational effects of the Preferred Alternatives. The Preferred Alternatives will have significant additive impacts on information technology / communication (IT / COMM) links and traffic.



**IT / COMM Links.** IT/COMM connections are required between the cantonment, LFTRC facilities, and training facilities at Anderson South. Short-term impacts would be anticipated during construction of the lines, but implementation of BMPs will reduce impacts.





# Preferred Alternatives: What are the Combined Impacts?

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## Significant Additive Impacts of the Preferred Alternatives (continued)

**Traffic.** The overall Marine Corps relocation to Guam would include new analysis of traffic impacts that are related to vehicle trips between cantonment and range facilities.

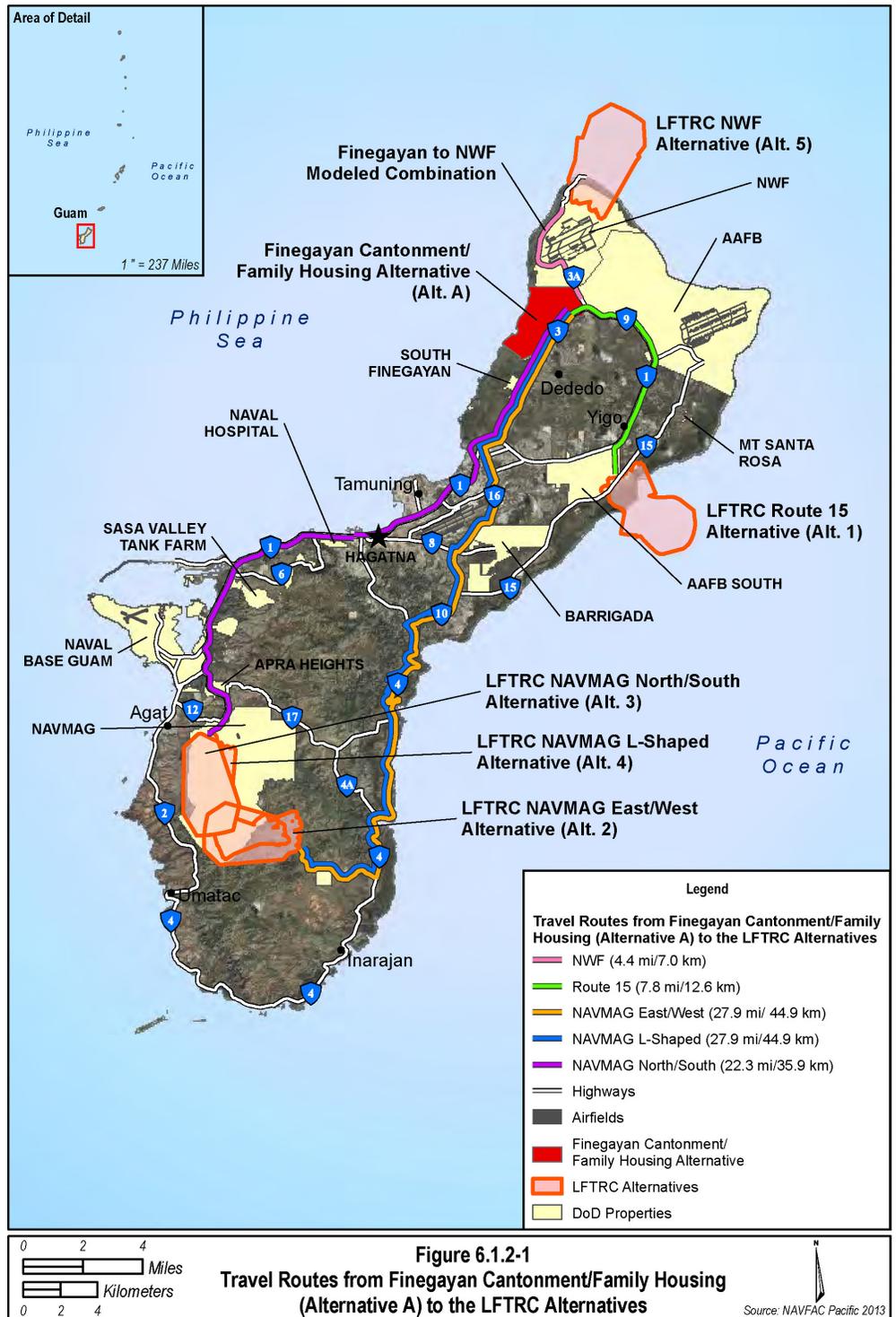
Ground transportation would be significantly impacted due to the increase in population. Impacts would affect over eight segments in at least one direction and nine intersections during a regular weekday. To reduce these impacts, the following improvements are recommended:

### Recommended roadway improvements

- **Route 1:** 3 to 34
- **Route 1:** 34 to 16
- **Route 3:** 3A/9 to Finegayan main gate
- **Route 3:** Finegayan commercial to Route 28
- **Route 3:** Route 28 to South Finegayan main gate
- **Route 3:** South Finegayan main gate to Route 1
- **Route 28:** Chalan Balako to Route 3.

### Recommended intersection improvements

- Route 3, 3A and 9
- Route 3 and Royal Palm
- Route 1 and 3
- Route 1 and 27
- Route 1 and 26
- Route 16 and 27
- Route 16 and 10A
- Route 1 and 14A
- Route 1 and 10A



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Definitions for terms and acronyms used in this and other related reports can be found in the Acronym Guide and Glossary at [www.one.guam.gov](http://www.one.guam.gov).