

magnitude of potential impacts to environmental justice under the No-Action Alternative would be larger than the potential impacts under the action alternatives discussed in Chapter 4, due to the increased scope and size of the No-Action Alternative. The action alternatives would avoid or significantly reduce environmental justice issues that can result from a substantial and rapid influx of people to a single island location, as proposed in the No-Action Alternative. There would be no significant noise impacts under the action alternatives. In addition, impacts to the economy, public health services, and social services relating to environmental justice would be reduced. The “boom and bust” cycle of population growth and decline proposed in the No-Action Alternative would be substantially alleviated under the action alternatives, reducing potential adverse impacts to the economy (and thus to low-income residents). Access to public health and social services would continue to be problematic under the action alternatives due to the increase in population accessing these services, but the level of strain to public health and social services would be lessened.

#### **4.7 SUMMARY OF IMPACTS AND POTENTIAL MITIGATION MEASURES FOR THE MAIN CANTONMENT/HOUSING ALTERNATIVES**

Table 4.7-1 summarizes the impacts and potential mitigation measures of each cantonment/family housing alternative, including the No-Action Alternative. BMPs to minimize impacts would be employed during construction (see Section 2.8). Significant impacts are highlighted in yellow in Table 4.7-1 and any potential mitigation measures are identified immediately following the associated impact.

**Table 4.7-1. Summary of Impacts and Potential Mitigation Measures for the Cantonment/Family Housing Alternatives**

<i>Finegayan (Alternative A)</i>	<i>Finegayan/South Finegayan (Alternative B)</i>	<i>Andersen Air Force Base (Alternative C)</i>	<i>Barrigada (Alternative D)</i>	<i>Finegayan/Andersen Air Force Base (Alternative E)</i>	<i>No-Action Alternative</i>
<b>GEOLOGICAL AND SOIL RESOURCES</b>					
<b>Construction Impacts</b>	<b>Construction Impacts</b>	<b>Construction Impacts</b>	<b>Construction Impacts</b>	<b>Construction Impacts</b>	<b>Construction Impacts</b>
<p><u>Topography</u> <b>LSI</b> Less than significant direct, long-term impacts to topography and slope stability from minor changes in surface elevations due to excavation and filling. Earthwork would include an estimated 3,159,000 yd<sup>3</sup> (2,415,230 m<sup>3</sup>) of cut and 2,483,000 yd<sup>3</sup> (1,898,391 m<sup>3</sup>) of fill. Alternative A would involve less excavation than all other alternatives except Alternative C and the No-Action Alternative. Construction BMPs would reduce impacts to a less than significant level.</p>	<p><u>Topography</u> <b>LSI</b> Direct, long-term impacts to topography and slope stability similar to Alternative A. Earthwork would include 3,245,000 yd<sup>3</sup> (2,480,980 m<sup>3</sup>) of cut and 2,731,000 yd<sup>3</sup> (2,087,999 m<sup>3</sup>) of fill, more than Alternatives A and C but less than Alternative D and the No-Action Alternative. Construction BMPs would reduce impacts to a less than significant level.</p>	<p><u>Topography</u> <b>LSI</b> Direct, long-term impacts to topography and slope stability similar to Alternative A. Earthwork would include 3,088,000 yd<sup>3</sup> (2,360,945 m<sup>3</sup>) of cut and 2,485,700 yd<sup>3</sup> (1,900,454 m<sup>3</sup>) of fill, less than all other alternatives. Construction BMPs would reduce impacts to a less than significant level.</p>	<p><u>Topography</u> <b>LSI</b> Direct, long-term impacts to topography and slope stability similar to Alternative A. Earthwork would include 3,510,000 yd<sup>3</sup> (2,683,589 m<sup>3</sup>) of cut and 2,618,000 yd<sup>3</sup> (2,001,606 m<sup>3</sup>) of fill, resulting in a net cut of 892,000 yd<sup>3</sup> (681,983 m<sup>3</sup>) and including grading a steep slope for a water tank. Alternative D would involve the second largest excavation volume of all five action alternatives, but substantially less than the No-Action Alternative. Construction BMPs would reduce impacts to a less than significant level.</p>	<p><u>Topography</u> <b>LSI</b> Direct, long-term impacts to topography and slope stability similar to Alternative A. Earthwork would include 3,732,871 yd<sup>3</sup> (2,853,984 m<sup>3</sup>) of cut (excavation) and 2,958,469 yd<sup>3</sup> (2,261,911 m<sup>3</sup>) of fill, resulting in a net of 774,402 yd<sup>3</sup> (92,072 m<sup>3</sup>) the largest amount of excavation of any of the action alternatives but substantially less than the No-Action Alternative. Construction BMPs would reduce impacts to a less than significant level.</p>	<p><u>Topography</u> <b>LSI</b> Direct, long-term impacts to topography and slope stability from minor changes in surface elevations due to excavation and filling. Specific cut/fill estimates are not available but the construction footprint would be 78% larger than for Alternative A and would involve a substantially larger amount of excavation. Construction BMPs would reduce impacts to a less than significant level.</p>
<p><u>Soils</u> <b>LSI</b> Less than significant direct, short-term impacts to soils from erosion. No indirect short-term impacts expected. Potential increase in construction-related erosion minimized with engineering controls per 22 GAR, Chapter 10 Guam Soil Erosion and Sediment Control Regulations and construction stormwater BMPs as per the Construction General Permit.</p> <p><b>NI</b> No prime farmland is identified in the development footprint. No direct or indirect impacts to agricultural soils.</p>	<p><u>Soils</u> <b>LSI</b> Direct, short-term impacts to soils similar to Alternative A. No indirect short-term impacts expected. Less construction/ development (approximately 320 acres [130 ha]) would occur in a previously undeveloped area as compared with Alternative A.</p> <p><b>NI</b> No prime farmland is identified in the development footprint. No direct or indirect impacts to agricultural soils.</p>	<p><u>Soils</u> <b>LSI</b> Direct, short-term impacts to soils similar to Alternative A. No indirect short-term impacts expected.</p> <p><b>NI</b> No prime farmland is identified in the development footprint. No direct or indirect impacts to agricultural soils.</p>	<p><u>Soils</u> <b>LSI</b> Direct, short-term impacts to soils similar to Alternative A. No indirect short-term impacts expected.</p> <p><b>NI</b> No prime farmland is identified in the development footprint. No direct or indirect impacts to agricultural soils.</p>	<p><u>Soils</u> <b>LSI</b> Direct, short-term impacts to soils similar to Alternative A. No indirect short-term impacts expected.</p> <p><b>NI</b> No prime farmland is identified in the development footprint. No direct or indirect impacts to agricultural soils.</p>	<p><u>Soils</u> <b>LSI</b> The No-Action Alternative's larger construction footprint would result in higher potential for direct and indirect impacts to soils from erosion, though still less than significant with implementation of BMPs to reduce and control runoff. More runoff potential over the longer term due to substantially larger impervious surface area (883 acres [357 ha]) compared to the action alternatives.</p> <p><b>NI</b> No prime farmland is identified in the development footprint. No direct or indirect impacts to agricultural soils.</p>
<p><u>Sinkholes</u> <b>LSI</b> There are 43 topographic features that may contain sinkholes in the Alternative A footprint. For any sinkholes discovered before or during construction, BMPs would include compliance with 22 GAR Chapter 10 § 10106F, including an environmental and hydrogeologic assessment to ensure adverse effects will not result. With these BMPs, and since no sinkholes would be filled that would adversely affect site drainage, no adverse impacts to sinkholes would occur. Construction of Alternative A would have less than significant direct, short-term impacts to sinkholes.</p>	<p><u>Sinkholes</u> <b>LSI</b> Under Alternative B, 41 features were preliminarily identified as topographic features that may contain sinkholes. Impacts and BMPs would be as described for Alternative A. No adverse impact given compliance with 22 GAR Chapter 10 § 10106F.</p>	<p><u>Sinkholes</u> <b>LSI</b> Under Alternative C, 28 features were preliminarily identified as topographic features that may contain sinkholes. Impacts and BMPs would be as described for Alternative A. No adverse impact given compliance with 22 GAR Chapter 10 § 10106F.</p>	<p><u>Sinkholes</u> <b>LSI</b> Under Alternative D, 15 features were preliminarily identified as topographic features that may contain sinkholes. Impacts and BMPs would be as described for Alternative A. No adverse impact given compliance with 22 GAR Chapter 10 § 10106F.</p>	<p><u>Sinkholes</u> <b>LSI</b> Under Alternative E, 34 features were preliminarily identified as topographic features that may contain sinkholes. Impacts and BMPs would be as described for Alternative A. No adverse impact given compliance with 22 GAR Chapter 10 § 10106F.</p>	<p><u>Sinkholes</u> <b>LSI</b> Approximately 62 features were preliminarily identified as sinkholes or depressions that may contain sinkholes within or on the perimeter of the No-Action Alternative footprint. By comparison, 43 similar features have been identified for Alternative A (the most of all action alternatives). The No-Action Alternative BMPs would include compliance with 22 GAR Chapter 10 § 10106F for protection of sinkholes, so there would be no adverse impacts to sinkholes.</p>

Legend: **SI** = significant impact; **SI-M** = significant impact-mitigable; **LSI** = less than significant impact; **NI** = no impact; **BI** = beneficial impact.

**Table 4.7-1. Summary of Impacts and Potential Mitigation Measures for the Cantonment/Family Housing Alternatives**

<i>Finegayan (Alternative A)</i>	<i>Finegayan/South Finegayan (Alternative B)</i>	<i>Andersen Air Force Base (Alternative C)</i>	<i>Barrigada (Alternative D)</i>	<i>Finegayan/Andersen Air Force Base (Alternative E)</i>	<i>No-Action Alternative</i>
<p><u>Geologic Hazards</u> <b>LSI</b> Potential direct and indirect short-term impacts associated with geologic hazards during construction of cantonment and family housing facilities, schools and utilities. Facilities would be on level areas not subject to slope instability. Structural hazards associated with earthquake-generated fault rupture/ground shaking (there are 3 minor bedrock faults mapped in the Alternative A footprint) would be minimized with application of UFC 3-310-04 Seismic Design of Buildings dated June 1, 2013 (USACE 2013) during design and construction. Compliance with 22 GAR Chapter 10 § 10106F would minimize potential geologic hazards associated with sinkholes.</p>	<p><u>Geologic Hazards</u> <b>LSI</b> Direct and indirect short-term impacts associated with geologic hazards and the application of BMPs would be similar to Alternative A.</p>	<p><u>Geologic Hazards</u> <b>LSI</b> Direct and indirect short-term impacts associated with geologic hazards and the application of BMPs would be similar to Alternative A, except there are 2 minor bedrock faults mapped within the Alternative C footprint.</p>	<p><u>Geologic Hazards</u> <b>LSI</b> Direct and indirect short-term impacts associated with geologic hazards and the application of BMPs would be similar to Alternative A, except there are no known bedrock faults mapped within the Alternative D footprint.</p>	<p><u>Geologic Hazards</u> <b>LSI</b> Direct and indirect short-term impacts associated with geologic hazards and the application of BMPs would be similar to Alternative A.</p>	<p><u>Geologic Hazards</u> <b>LSI</b> Direct and indirect short-term impacts associated with geologic hazards and the application of BMPs would be similar to Alternative A (there are 3 minor bedrock faults mapped within the development footprint for the No-Action Alternative).</p>
<p><b>Operation Impacts</b> <u>Topography</u> <b>NI</b> No direct or indirect impacts to topography because no large scale grading or changes to elevation would occur during operations.</p>	<p><b>Operation Impacts</b> <u>Topography</u> <b>NI</b> No direct or indirect impacts to topography because no large scale grading or changes to elevation would occur during operations.</p>	<p><b>Operation Impacts</b> <u>Topography</u> <b>NI</b> No direct or indirect impacts to topography because no large scale grading or changes to elevation would occur during operations.</p>	<p><b>Operation Impacts</b> <u>Topography</u> <b>NI</b> No direct or indirect impacts to topography because no large scale grading or changes to elevation would occur during operations.</p>	<p><b>Operation Impacts</b> <u>Topography</u> <b>NI</b> No direct or indirect impacts to topography because no large scale grading or changes to elevation would occur during operations.</p>	<p><b>Operation Impacts</b> <u>Topography</u> <b>NI</b> No direct or indirect impacts to topography because no large scale grading or changes to elevation would occur during operations.</p>
<p><u>Soils</u> <b>LSI</b> Potential direct long-term impacts to soils from erosion associated with minimal surface disturbance during maintenance activities. Impacts would be reduced by implementation of construction stormwater BMPs.</p>	<p><u>Soils</u> <b>LSI</b> Potential for erosion impacts during maintenance activities as described for Alternative A. BMPs would be applied to keep impacts less than significant.</p>	<p><u>Soils</u> <b>LSI</b> Potential for erosion impacts during maintenance activities as described for Alternative A. BMPs would be applied to keep impacts less than significant.</p>	<p><u>Soils</u> <b>LSI</b> Potential for erosion impacts during maintenance activities as described for Alternative A. BMPs would be applied to keep impacts less than significant.</p>	<p><u>Soils</u> <b>LSI</b> Potential for erosion impacts during maintenance activities as described for Alternative A. BMPs would be applied to keep impacts less than significant.</p>	<p><u>Soils</u> <b>LSI</b> Potential for erosion impacts during maintenance activities as described for Alternative A. BMPs would be applied to keep impacts less than significant.</p>
<p><u>Sinkholes</u> <b>LSI</b> BMPs and compliance with 22 GAR Chapter 10 § 10106F would reduce potential impacts if maintenance activities would occur near topographic features that may contain sinkholes (43 such features have been identified in the Alternative A footprint).</p>	<p><u>Sinkholes</u> <b>LSI</b> Potential impacts and application of BMPs would be as described for Alternative A (except that 41 features that may contain sinkholes have been identified in the Alternative B footprint).</p>	<p><u>Sinkholes</u> <b>LSI</b> Potential impacts and application of BMPs would be as described for Alternative A (except that 28 features that may contain sinkholes have been identified in the Alternative C footprint).</p>	<p><u>Sinkholes</u> <b>LSI</b> Potential impacts and application of BMPs would be as described for Alternative A (except that 15 features that may contain sinkholes have been identified in the Alternative D footprint).</p>	<p><u>Sinkholes</u> <b>LSI</b> Potential impacts and application of BMPs would be as described for Alternative A (except that 34 features that may contain sinkholes have been identified in the Alternative E footprint).</p>	<p><u>Sinkholes</u> <b>LSI</b> Potential impacts and application of BMPs would be as described for Alternative A (except that 62 features that may contain sinkholes have been identified in the No-Action Alternative footprint).</p>
<p><u>Geologic Hazards</u> <b>LSI</b> Operations would result in less than significant direct and indirect long term impacts associated with geologic hazards. Minimal hazards would be associated with slope instability and liquefaction. Potential structural damage or injuries during operations from seismic ground-shaking and fault rupture would be minimized by adherence to UFC 3-310-04 Seismic Design of Buildings dated June 1, 2013 (USACE 2013) during design and construction. Sinkhole BMPs during maintenance operations would minimize potential geologic hazards associated with sinkholes.</p>	<p><u>Geologic Hazards</u> <b>LSI</b> Due to consistency in operations and application of BMPs regardless of alternative, and relatively small differences in site conditions, impacts associated with geologic hazards during operations would be similar to the description for Alternative A.</p>	<p><u>Geologic Hazards</u> <b>LSI</b> Due to consistency in operations and application of BMPs regardless of alternative, and relatively small differences in site conditions, impacts associated with geologic hazards during operations would be similar to the description for Alternative A.</p>	<p><u>Geologic Hazards</u> <b>LSI</b> Due to consistency in operations and application of BMPs regardless of alternative, and relatively small differences in site conditions, impacts associated with geologic hazards during operations would be similar to the description for Alternative A.</p>	<p><u>Geologic Hazards</u> <b>LSI</b> Due to consistency in operations and application of BMPs regardless of alternative, and relatively small differences in site conditions, impacts associated with geologic hazards during operations would be similar to the description for Alternative A.</p>	<p><u>Geologic Hazards</u> <b>LSI</b> Due to consistency in operations and application of BMPs regardless of alternative, and relatively small differences in site conditions, impacts associated with geologic hazards during operations would be similar to the description for Alternative A.</p>

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**Table 4.7-1. Summary of Impacts and Potential Mitigation Measures for the Cantonment/Family Housing Alternatives**

<i>Finegayan (Alternative A)</i>	<i>Finegayan/South Finegayan (Alternative B)</i>	<i>Andersen Air Force Base (Alternative C)</i>	<i>Barrigada (Alternative D)</i>	<i>Finegayan/Andersen Air Force Base (Alternative E)</i>	<i>No-Action Alternative</i>
<b>WATER RESOURCES</b>					
<b>Construction Impacts</b>	<b>Construction Impacts</b>	<b>Construction Impacts</b>	<b>Construction Impacts</b>	<b>Construction Impacts</b>	<b>Construction Impacts</b>
<p><u>Surface Water</u> <i>NI</i> No surface waters are located within or near the construction area. No structures would be constructed within a flood zone.</p>	<p><u>Surface Water</u> <i>NI</i> No surface waters are located within or near the construction area. No structures would be constructed within a flood zone.</p>	<p><u>Surface Water</u> <i>NI</i> No surface waters are located within or near the construction area. No structures would be constructed within a flood zone.</p>	<p><u>Surface Water</u> <i>LSI</i> Potential short-term increase in stormwater runoff, erosion, and sedimentation could have indirect effects on wetlands. Impacts would be minimized with SWPPPs and BMPs. No facilities would be constructed in flood zones, but some stormwater detention basins may be constructed.</p>	<p><u>Surface Water</u> <i>NI</i> No surface waters are located within or near the construction area. No structures would be constructed within a flood zone.</p>	<p><u>Surface Water</u> <i>NI</i> No surface waters are located within or near the construction area. No structures would be constructed within a flood zone.</p>
<p><u>Groundwater</u> <i>SI-M</i> Potential increases in the rate of sewage spills associated with the induced civilian growth and construction/DoD workforce would result in significant indirect impacts to groundwater quality.</p> <p><b>Potential Mitigation Measures</b> Refurbishment of the GWA sewage system would mitigate significant impacts to groundwater resources during construction. The FY 2014 NDAA requires the EAC to develop an implementation plan that addresses public infrastructure requirements necessary to support the preferred alternative. To support this implementation plan, DoD assessed GWA's water and wastewater systems that may be affected by the preferred alternative. The water and wastewater assessment recommended the refurbishment of the GWA interceptor sewer from AAFB to the Northern District WWTP. Also, Section 8102 of the FY 2014 Consolidated Appropriations Act (Public Law No. 113-76) appropriated \$106.4 million to the Secretary of Defense, acting through the OEA, for civilian water and wastewater improvements on Guam. These funds will remain available until expended.</p> <p><i>LSI</i> Short-term, direct impacts from potential for stormwater to reach NGLA. Stormwater runoff and sinkhole protection measures would serve to protect groundwater quality. Siting and construction of wells would be implemented according to GEPA regulations.</p>	<p><u>Groundwater</u> <i>SI-M</i> Impacts would be similar to Alternative A.</p> <p><b>Potential Mitigation Measures</b> Mitigation would be the same as Alternative A.</p>	<p><u>Groundwater</u> <i>SI-M</i> Impacts would be similar to Alternative A.</p> <p><b>Potential Mitigation Measures</b> Mitigation would be the same as Alternative A.</p>	<p><u>Groundwater</u> <i>SI-M</i> Impacts would be similar to Alternative A.</p> <p><b>Potential Mitigation Measures</b> Mitigation would be the same as Alternative A.</p>	<p><u>Groundwater</u> <i>SI-M</i> Impacts would be similar to Alternative A.</p> <p><b>Potential Mitigation Measures</b> Mitigation would be the same as Alternative A.</p>	<p><u>Groundwater</u> <i>SI-M</i> Impacts would be similar to Alternative A but even more severe because of the substantially larger workforce population required during construction for the No-Action Alternative.</p> <p><b>Potential Mitigation Measures</b> Mitigation would be the same as Alternative A.</p>
<p><i>LSI</i> Impacts would be similar to Alternative A.</p>	<p><i>LSI</i> Impacts would be similar to Alternative A.</p>	<p><i>LSI</i> Impacts would be similar to Alternative A.</p>	<p><i>LSI</i> Impacts would be similar to Alternative A.</p>	<p><i>LSI</i> Impacts would be similar to Alternative A.</p>	<p><i>LSI</i> Impacts would be similar to Alternative A.</p>

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**Table 4.7-1. Summary of Impacts and Potential Mitigation Measures for the Cantonment/Family Housing Alternatives**

<i>Finegayan (Alternative A)</i>	<i>Finegayan/South Finegayan (Alternative B)</i>	<i>Andersen Air Force Base (Alternative C)</i>	<i>Barrigada (Alternative D)</i>	<i>Finegayan/Andersen Air Force Base (Alternative E)</i>	<i>No-Action Alternative</i>
<p><u>Nearshore Waters</u> <b>SI</b> Increased wastewater flow associated with induced civilian and construction/DoD workforce growth under Alternative A would result in a significant and unmitigable indirect impact to nearshore waters from increased wastewater discharge from the Northern District WWTP outfall. The Northern District WWTP is non-compliant with the current NPDES permit and increasing the wastewater discharge from a non-compliant treatment plant would be a significant indirect impact during the period of non-compliance. Until the WWTP upgrades are completed (see Operation Impacts below) there would be an indirect and unmitigable significant impact to nearshore waters during construction.</p> <p><b>NI</b> Short-term increase in Stormwater runoff would not discharge to nearshore waters with adherence to the Construction General Permit, BMPs, and SWPPPs.</p>	<p><u>Nearshore Waters</u> <b>SI</b> Impacts would be similar to Alternative A.</p> <p><b>NI</b> Impacts would be similar to Alternative A.</p>	<p><u>Nearshore Waters</u> <b>SI</b> Impacts would be similar to Alternative A.</p> <p><b>NI</b> Impacts would be similar to Alternative A.</p>	<p><u>Nearshore Waters</u> <b>SI</b> Induced civilian and construction/DoD workforce growth under Alternative D would result in a significant unmitigable indirect impact to nearshore waters from increased wastewater discharge from the Northern District and Agaña WWTPs that are non-compliant with the current NPDES permits. Increasing the wastewater discharge from a non-compliant treatment plant would be a significant indirect impact during the period of non-compliance. Until the WWTP upgrades are completed there would be an indirect and unmitigable significant impact to nearshore waters during construction.</p> <p><b>NI</b> Impacts would be similar to Alternative A.</p>	<p><u>Nearshore Waters</u> <b>SI</b> Impacts would be similar to Alternative A.</p> <p><b>NI</b> Impacts would be similar to Alternative A.</p>	<p><u>Nearshore Waters</u> <b>SI</b> Impacts would be similar to those described under Alternative A, except that with the longer duration of construction and larger construction workforce projection as compared to the 2012 Roadmap Adjustments, the related increase in wastewater discharge from the Northern District WWTP would be substantially larger under the No-Action Alternative.</p> <p><b>LSI</b> Impacts would be similar to Alternative A.</p>
<p><u>Wetlands</u> <b>NI</b> No wetlands are located within or near the construction areas.</p>	<p><u>Wetlands</u> <b>NI</b> Impacts would be similar to Alternative A.</p>	<p><u>Wetlands</u> <b>NI</b> Impacts would be similar to Alternative A.</p>	<p><u>Wetlands</u> <b>SI-M</b> Direct impact (fill) of approximately 0.1 acre of potentially jurisdictional wetland area.</p> <p><b>Potential Mitigation Measures</b> If LEDPA, a Section 404 permit would be obtained for unavoidable impacts to jurisdictional wetlands and direct impacts would be mitigated by creating new wetlands, restoring or enhancing existing wetlands, or preserving existing wetland areas on Guam to, at a minimum, replace the area filled.</p> <p><b>LSI</b> Short-term, indirect impact from potential increase in construction-related runoff and sedimentation to down gradient wetlands.</p>	<p><u>Wetlands</u> <b>NI</b> Impacts would be similar to Alternative A.</p>	<p><u>Wetlands</u> <b>NI</b> Impacts would be similar to Alternative A.</p>
<b>Operation Impacts</b>	<b>Operation Impacts</b>	<b>Operation Impacts</b>	<b>Operation Impacts</b>	<b>Operation Impacts</b>	<b>Operation Impacts</b>
<p><u>Surface Water</u> <b>NI</b> No surface waters are located within or near the project area. Implementation of BMPs and LID measures to ensure no off-site transport of excess runoff, sediment, or pollutants.</p>	<p><u>Surface Water</u> <b>NI</b> Impacts and application of BMPs and LID measures would be as described for Alternative A.</p>	<p><u>Surface Water</u> <b>NI</b> Impacts and application of BMPs and LID measures would be as described for Alternative A.</p>	<p><u>Surface Water</u> <b>LSI</b> Indirect impacts on wetlands from potential increase in stormwater runoff and associated pollutants.</p>	<p><u>Surface Water</u> <b>NI</b> Impacts and application of BMPs and LID measures would be as described for Alternative A.</p>	<p><u>Surface Water</u> <b>SI-M</b> Although no surface waters are located on or near the cantonment/housing site for the No-Action Alternative, the large increase in island-wide demand on the existing Guam sewer collection systems, due to the large amount of induced growth projected (as compared to the five SEIS action alternatives), would result in significant adverse indirect impacts from increased potential for sewage spills anywhere on the central sewer collection system. Such spills could affect nearby surface waters anywhere they occurred.</p>

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<i>Finegayan (Alternative A)</i>	<i>Finegayan/South Finegayan (Alternative B)</i>	<i>Andersen Air Force Base (Alternative C)</i>	<i>Barrigada (Alternative D)</i>	<i>Finegayan/Andersen Air Force Base (Alternative E)</i>	<i>No-Action Alternative</i>
					<p><b>Potential Mitigation Measures</b> Mitigation would be the same as defined in the 2010 ROD.</p> <p><b>LSI</b> Total amount of impervious area would increase by 883 acres (357 ha), resulting in potential increase in stormwater runoff, erosion, and sedimentation.</p>
<p><b>Groundwater</b> <b>SI-M</b> Long-term increase in annual groundwater production of 1.7 MGd could result in a localized significant impact to the NGLA. Also, further deterioration to the existing GWA interceptor sewer system from AAFB to the Northern District WWTP could result in failure and significant impacts to groundwater quality from wastewater leaks.</p> <p><b>Potential Mitigation Measures</b> The DoD would, as appropriate, implement enhanced water conservation measures for the proposed action, improve existing DoD water systems to reduce system leaks, adjust pumping rates at DoD wells, use existing wells, and/or increase the use of surface water from Fena Reservoir, in order to reduce withdrawals from the NGLA.</p> <p>The DoD would continue to support the GWRDG and would support USGS's recommendation to rehabilitate and expand the hydrologic data collection network and monitoring necessary to ensure sustainable management of NGLA.</p> <p>As required in the FY 2014 NDAA, the EAC implementation plan will address public infrastructure requirements necessary to support the preferred alternative, as well as address groundwater-related issues including technical and financial assistance for an updated and expanded NGLA monitoring well network and the refurbishment of the GWA interceptor sewer from AAFB to the Northern District WWTP. The implementation plan will detail descriptions of work, costs, and schedules for completion of construction, improvements, and repairs to Guam public infrastructure affected by the realignment, including improvements and upgrades to the NGLA monitoring well network. To support this implementation plan, DoD assessed GWA's water and wastewater</p>	<p><b>Groundwater</b> <b>SI-M</b> Impacts would be similar to Alternative A. However, less area converted to impervious area than under Alternative A. The increased groundwater withdrawal rate would be the same. Potential impacts to groundwater from increased flow through the GWA interceptor sewer system would be the same as Alternative A</p> <p><b>Potential Mitigation Measures</b> Mitigation would be the same as under Alternative A.</p>	<p><b>Groundwater</b> <b>SI-M</b> Impacts would be similar to Alternative A. However, less area converted to impervious area than under Alternative A. The increased groundwater withdrawal rate would be the same. Potential impacts to groundwater from increased flow through the GWA interceptor sewer system would be the same as Alternative A</p> <p><b>Potential Mitigation Measures</b> Mitigation would be the same as under Alternative A.</p>	<p><b>Groundwater</b> <b>SI-M</b> Impacts would be similar to Alternative A. However, more area converted to impervious area than under Alternative A. The increased groundwater withdrawal rate would be the same. Potential impacts to groundwater from increased flow through the GWA interceptor sewer system would be the same as Alternative A</p> <p><b>Potential Mitigation Measures</b> Mitigation would be the same as under Alternative A, but would include recommended upgrades of both the Agaña WWTP and Northern District WWTPs.</p>	<p><b>Groundwater</b> <b>SI-M</b> Impacts would be similar to Alternative A. However, less area converted to impervious area than under Alternative A. The increased groundwater withdrawal rate would be the same. Potential impacts to groundwater from increased flow through the GWA interceptor sewer system would be the same as Alternative A</p> <p><b>Potential Mitigation Measures</b> Mitigation would be the same as under Alternative A.</p>	<p><b>Groundwater</b> <b>SI-M</b> Long-term increase in annual groundwater production of 5.8 MGd would result in a localized significant impact to the NGLA</p> <p><b>Potential Mitigation Measures</b> Mitigation would be the same as Alternative A.</p> <p><b>SI-M</b> The large increase in island-wide demand on the existing Guam sewer collection systems, due to the large amount of induced growth projected (as compared to the five SEIS action alternatives), would result in significant adverse indirect impacts from increased potential for sewage spills anywhere on the central sewer collection system.</p> <p><b>Potential Mitigation Measures</b> Mitigation would be the same as under Alternative A.</p>

Legend: *SI* = significant impact; *SI-M* = significant impact-mitigable; *LSI* = less than significant impact; *NI* = no impact; *BI* = beneficial impact.

**Table 4.7-1. Summary of Impacts and Potential Mitigation Measures for the Cantonment/Family Housing Alternatives**

<i>Finegayan (Alternative A)</i>	<i>Finegayan/South Finegayan (Alternative B)</i>	<i>Andersen Air Force Base (Alternative C)</i>	<i>Barrigada (Alternative D)</i>	<i>Finegayan/Andersen Air Force Base (Alternative E)</i>	<i>No-Action Alternative</i>
<p>systems that may be affected by the preferred alternative. The water and wastewater assessment recommended an updated and expanded NGLA monitoring well network and the refurbishment of the GWA interceptor sewer from AAFB to the Northern District WWTP. Section 8102 of the FY 2014 Consolidated Appropriations Act (Public Law No. 113-76) appropriated \$106.4 million to the Secretary of Defense, acting through the OEA, for civilian water and wastewater improvements on Guam. These funds will remain available until expended.</p> <p><b>LSI</b> Minor long-term increase in aquifer recharge rates with an additional 273 acres (110 ha) of impervious area; direct impact from increase in pollutant loading potential.</p>	<p><b>LSI</b> Minor long-term increase in aquifer recharge rates with an additional 176 acres (71 ha) of impervious area; direct impact from increase in pollutant loading potential.</p>	<p><b>LSI</b> Minor long-term increase in aquifer recharge rates with an additional 126 acres (51 ha) of impervious area; direct impact from increase in pollutant loading potential.</p>	<p><b>LSI</b> Minor long-term increase in aquifer recharge rates with an additional 319 acres (129 ha) of impervious area; direct impact from increase in pollutant loading potential.</p>	<p><b>LSI</b> Minor long-term increase in aquifer recharge rates with an additional 280 acres (113 ha) of impervious area at Finegayan; direct impact from increase in pollutant loading potential.</p>	<p><b>LSI</b> Minor long-term increase in aquifer recharge rates with an additional 883 acres (357 ha) of impervious area; direct impact from increase in pollutant loading potential.</p>
<p><u>Nearshore Waters</u> <b>SI-M</b> Operation of the cantonment and family housing facilities under Alternative A would result in a significant but mitigable impact to nearshore waters from increased wastewater discharge from the Northern District WWTP outfall. The Northern District WWTP is non-compliant with the treatment standards required by the current NPDES permit and increasing the wastewater discharge from a non-compliant treatment plant would be a significant indirect impact during the period of non-compliance. However, upgrades to bring the Northern District WWTP into compliance with the permit are expected to be completed early in the operational phase of the proposed action and such upgrades would mitigate the impact to a less than significant level.</p> <p><b>Potential Mitigation Measures</b> Upgrading the Northern District WWTP treatment systems (as required by the 2013 NPDES permit) would mitigate significant impacts to the wastewater system on Guam once the upgrades are completed. In addition, refurbishing the main GWA sewer lines from AAFB to the Northern District WWTP along Routes 3 and 9 would mitigate potential failure of the concrete reinforced sewer lines that are in a state of deterioration. The FY 2014 NDAA directed the Secretary of Defense to convene the EAC in part to develop an implementation plan that will address public infrastructure requirements necessary to support the</p>	<p><u>Nearshore Waters</u> <b>SI-M</b> Impacts associated with WWTP discharge to nearshore waters would be similar to those described under Alternative A.</p> <p><b>Potential Mitigation Measures</b> Mitigation would be the same as described under Alternative A.</p>	<p><u>Nearshore Waters</u> <b>SI-M</b> Impacts associated with WWTP discharge to nearshore waters would be similar to those described under Alternative A.</p> <p><b>Potential Mitigation Measures</b> Mitigation would be the same as described under Alternative A.</p>	<p><u>Nearshore Waters</u> <b>SI-M</b> Impacts associated with WWTP discharge to nearshore waters would be similar to those described under Alternative A but would involve discharge from both the Northern District and the Agaña WWTPs.</p> <p><b>Potential Mitigation Measures</b> Mitigation would be the same as under Alternative A, but would include recommended upgrades of both the Agaña WWTP and Northern District WWTPs.</p>	<p><u>Nearshore Waters</u> <b>SI-M</b> Impacts associated with WWTP discharge to nearshore waters would be similar to those described under Alternative A.</p> <p><b>Potential Mitigation Measures</b> Mitigation would be the same as described under Alternative A.</p>	<p><u>Nearshore Waters</u> <b>SI-M</b> Impacts associated with WWTP discharge to nearshore waters would be similar to those described under Alternative A but would be more intensive because of the larger projected population increase under the No-Action Alternative.</p> <p><b>Potential Mitigation Measures</b> Mitigation would be the same as described under Alternative A.</p> <p><b>SI-M</b> The large increase in island-wide demand on the existing Guam sewer collection systems, due to the large amount of induced growth projected (as compared to the five SEIS action alternatives), would result in significant adverse indirect impacts from increased potential for sewage spills anywhere on the central sewer collection system.</p> <p><b>Potential Mitigation Measures</b> Mitigation would be the same as defined in the 2010 ROD.</p>

Legend: *SI* = significant impact; *SI-M* = significant impact-mitigable; *LSI* = less than significant impact; *NI* = no impact; *BI* = beneficial impact.

**Table 4.7-1. Summary of Impacts and Potential Mitigation Measures for the Cantonment/Family Housing Alternatives**

<i>Finegayan (Alternative A)</i>	<i>Finegayan/South Finegayan (Alternative B)</i>	<i>Andersen Air Force Base (Alternative C)</i>	<i>Barrigada (Alternative D)</i>	<i>Finegayan/Andersen Air Force Base (Alternative E)</i>	<i>No-Action Alternative</i>
<p>preferred alternative. The implementation plan will detail descriptions of work, costs, and schedules for completion of construction, improvements, and repairs to Guam public infrastructure affected by the realignment, including improvements and upgrades to the Guam wastewater system. The water and wastewater assessment that DoD prepared to support the Implementation Plan recommended upgrades to the Northern District WWTP and the refurbishment of the GWA interceptor sewer from AAFB to the Northern District WWTP. Section 8102 of the FY 2014 Consolidated Appropriations Act (Public Law No. 113-76) appropriated \$106.4 million to the Secretary of Defense, acting through the OEA, for civilian water and wastewater improvements on Guam. These funds will remain available until expended.</p> <p><i>NI</i> No direct or indirect impact from stormwater runoff discharge from the project area to nearshore waters.</p>					
<p><u>Wetlands</u> <i>NI</i> No wetlands are located within or near the project area.</p>	<p><u>Wetlands</u> <i>NI</i> Impacts would be similar to Alternative A.</p>	<p><u>Wetlands</u> <i>NI</i> Impacts would be similar to Alternative A.</p>	<p><u>Wetlands</u> <i>LSI</i> Indirect, long-term impact on wetlands from potential minor increase in stormwater runoff and associated pollutants.</p>	<p><u>Wetlands</u> <i>NI</i> Impacts would be similar to Alternative A.</p>	<p><u>Wetlands</u> <i>SI-M</i> Although no wetlands are located on or near the cantonment/housing site for the No-Action Alternative, the large increase in island-wide demand on the existing Guam sewer collection systems, due to the large amount of induced growth projected (as compared to the five SEIS action alternatives), would result in significant adverse indirect impacts from increased potential for sewage spills anywhere on the central sewer collection system. Such spills could affect nearby wetlands anywhere they occurred.</p> <p><b>Potential Mitigation Measures</b> Mitigation would be the same as defined in the 2010 ROD.</p>

Legend: *SI* = significant impact; *SI-M* = significant impact-mitigable; *LSI* = less than significant impact; *NI* = no impact; *BI* = beneficial impact.



**Table 4.7-1. Summary of Impacts and Potential Mitigation Measures for the Cantonment/Family Housing Alternatives**

<i>Finegayan (Alternative A)</i>	<i>Finegayan/South Finegayan (Alternative B)</i>	<i>Andersen Air Force Base (Alternative C)</i>	<i>Barrigada (Alternative D)</i>	<i>Finegayan/Andersen Air Force Base (Alternative E)</i>	<i>No-Action Alternative</i>
<b>AIR QUALITY</b>					
<b>Construction Impacts</b>	<b>Construction Impacts</b>	<b>Construction Impacts</b>	<b>Construction Impacts</b>	<b>Construction Impacts</b>	<b>Construction Impacts</b>
<p><b>LSI</b> The construction phase direct short-term increase in emissions would be below the impact significance threshold. On-base construction site hot-spot particulate matter impact analysis estimated the total PM levels would be well below respective NAAQS, resulting in less than significant direct, short-term PM impacts during construction years. Construction phase off-base roadway hot-spot particulate matter, carbon monoxide, and mobile source air toxics impact conclusion found predicted levels would be well below the NAAQS, resulting in less than significant direct, short-term CO, PM, and MSAT impacts.</p>	<p><b>LSI</b> The construction phase direct short-term increase in emissions would be below the impact significance threshold. Construction phase increase in sulfur dioxide emissions within the Tanguisson nonattainment area (South Finegayan housing area) would be below the general conformity <i>de minimis level</i> and no formal conformity rule determination is required. On-base construction site hot-spot particulate matter impact analysis found the total PM levels predicted would be below respective NAAQS resulting in less than significant direct, short-term PM and MSAT impacts during construction years. Construction phase off-base roadway hot-spot particulate matter, carbon monoxide, and mobile source air toxics impact conclusion found predicted levels would be well below the NAAQS, resulting in less than significant direct, short-term CO, PM, MSAT impacts.</p>	<p><b>LSI</b> The construction phase direct short-term increase in emissions would be below the impact significance threshold. Short-term on-site hot spot PM impacts around construction sites would be less or similar to those under Alternative A. Project impacts of all carcinogenic and non-carcinogenic MSATs are considered acceptable. Off-site on road vehicle CO, PM, and MSATs hot-spot impact concentrations for Alternative C would be similar in magnitude to those predicted for Alternative A; predicted levels of PM and CO would be below the NAAQS.</p>	<p><b>LSI</b> The construction phase direct short-term increase in emissions would be below the impact significance threshold. Short-term on-site hot-spot PM impacts around construction sites would be anticipated as less or similar to those under Alternative A. Off-site on road vehicle CO, PM, and MSATs hot-spot impact concentrations for Alternative D would be similar to those predicted for Alternative A; predicted levels of PM and CO would be below the NAAQS. Project impacts of all non-carcinogenic MSATs are considered acceptable.</p>	<p><b>LSI</b> The construction phase direct short-term increase in emissions would be below the impact significance threshold. Under Alternative E, the short-term on-site hot-spot PM impacts near construction sites would be less than or similar to those under Alternative A, which is anticipated to have the greatest truck emissions impacts along the truck routes. Off-site on-road vehicle CO, PM, and MSATs hot-spot impact concentrations for Alternative E would be similar in magnitude to those predicted for Alternative A at the analyzed intersections according to similar traffic patterns. Predicted levels of PM and CO are well below the NAAQS resulting in less than significant hot-spot PM and CO impacts during the construction period. Similarly, the project impacts of all carcinogenic MSATs and all non-carcinogenic MSATs are also considered acceptable.</p>	<p><b>LSI</b> Impacts would be greater than each proposed alternative given the greater scale of construction activities. The construction phase increase in sulfur dioxide emissions within both Piti and Tanguisson nonattainment areas would be below the general conformity <i>de minimis level</i> and no formal conformity rule determination would be required. Impact conclusions would remain the same as described in the 2010 Final EIS.</p>
<b>Operation Impacts</b>	<b>Operation Impacts</b>	<b>Operation Impacts</b>	<b>Operation Impacts</b>	<b>Operation Impacts</b>	<b>Operation Impacts</b>
<p><b>LSI</b> Direct and indirect impacts associated with long-term operational phase off-base roadway hot-spot particulate matter, carbon monoxide, and mobile source air toxics from increased traffic congestion.</p>	<p><b>LSI</b> Impacts would be similar to Alternative A</p>	<p><b>LSI</b> Impacts would be similar to Alternative A. In addition, because AAFB is a Prevention of Significant Deterioration source, a permit modification could be required as a result of the proposed project. This determination would be made during the final design stage to ensure that the development on AAFB would be in compliance with applicable regulatory requirements.</p>	<p><b>LSI</b> Impacts would be similar to Alternative A</p>	<p><b>LSI</b> The estimated traffic congestion conditions under Alternative E would be comparable to those for Alternatives A and C. Given the low levels of CO and MSATs impact concentrations predicted under Alternative A and the comparable traffic congestion conditions at analyzed intersections under Alternative C as compared to Alternative A, the hot-spot impact of off-site on-road vehicle CO and MSATs emissions under Alternative E during operational years would be similar to Alternative A. Based on these findings, long-term operational phase air quality impacts under Alternative E are considered less than significant.</p>	<p><b>LSI</b> Impacts would be slightly greater than each proposed alternative given the greater scale of operational activities. Impact conclusions would remain the same as described in the 2010 Final EIS.</p>

Legend: **SI** = significant impact; **SI-M** = significant impact-mitigable; **LSI** = less than significant impact; **NI** = no impact; **BI** = beneficial impact.

**Table 4.7-1. Summary of Impacts and Potential Mitigation Measures for the Cantonment/Family Housing Alternatives**

<i>Finegayan (Alternative A)</i>	<i>Finegayan/South Finegayan (Alternative B)</i>	<i>Andersen Air Force Base (Alternative C)</i>	<i>Barrigada (Alternative D)</i>	<i>Finegayan/Andersen Air Force Base (Alternative E)</i>	<i>No-Action Alternative</i>
<b>NOISE</b>					
<b>Construction Impacts</b>	<b>Construction Impacts</b>	<b>Construction Impacts</b>	<b>Construction Impacts</b>	<b>Construction Impacts</b>	<b>Construction Impacts</b>
<i>LSI</i> Direct and indirect impacts from construction noise. Short-term construction noise affecting the nearest receptors at Finegayan would be 65.4 dB L <sub>eq</sub> , which is below USEPA threshold guideline of 75 dBA L <sub>eq</sub> . Receptors include 20 houses (70-75 people) along Route 3. Long-term noise emanating from the center of the cantonment/family housing area would be 54.5 and 51.5 dBA L <sub>eq</sub> , respectively, and be well below FICUN guidelines.	<i>LSI</i> Direct and indirect impacts from construction noise. Short-term construction noise affecting the nearest receptors at Finegayan would be 65.4 dB L <sub>eq</sub> , which is below USEPA threshold guideline of 75 dBA L <sub>eq</sub> . This alternative impacts 10 more houses (36 people) than under Alternative A. Long-term noise emanating from the center of the cantonment/family housing area would be 54.5 and 57.8 dBA L <sub>eq</sub> , respectively, and be well below FICUN guidelines.	<i>LSI</i> Direct and indirect impacts from construction noise. Short-term construction noise affecting the nearest receptors at Andersen AAFB would be 74.8 dB L <sub>eq</sub> for family housing and 59 dB L <sub>eq</sub> for cantonment. Similar to Alternative 1, 20 houses (75 people) would be impacted. Long-term noise emanating from the center of the cantonment/family housing area would be 50.4 and 57.8 dBA L <sub>eq</sub> , respectively, and be well below FICUN guidelines.	<i>LSI</i> Direct and indirect impacts from construction noise. Short-term construction noise affecting the nearest receptors at Barrigada would be 74.8 dB L <sub>eq</sub> and within acceptable limits. 25 homes (92 people) would be impacted, which is the greatest and only slightly more than Alternative A. The extended construction period would further lessen impacts. Long-term noise emanating from the center of the cantonment/family housing area would be 62.4 and 56.4 dBA L <sub>eq</sub> , respectively, and be well below FICUN guidelines.	<i>LSI</i> Impacts would be similar to Alternative A and C. Direct and indirect impacts from construction noise. Short-term construction noise affecting the nearest receptors at Finegayan would be 65.4 dB Leq and within acceptable limits. 20 homes (70-75 people) would be impacted, which is similar to Alternative A. The proposed housing areas on AAFB would be located just outside the 65 dBA DNL Andersen AAFB airfield noise zones with approximately the same amount of area in each zone. Long-term noise emanating from the center of the cantonment area at Finegayan and the center of the housing area at AAFB would be well below FICUN guidelines.	<i>SI-M</i> Construction noise would impact residences along Route 3. Impacts would be less than significant or significant but mitigable, depending on the location of construction activities.  <i>Potential Mitigation Measures</i> <b>Construction sequencing, sound barriers, installation and periodic inspection of sound reducing devices on construction machinery, and shutting off idling equipment to reduce impacts to less than significant.</b>
<b>Operation Impacts</b>	<b>Operation Impacts</b>	<b>Operation Impacts</b>	<b>Operation Impacts</b>	<b>Operation Impacts</b>	<b>Operation Impacts</b>
<i>LSI</i> Long-term direct impact. Traffic noise would be below 66 dB and comply with Guam Department of Public Works standards. Long-term operations would be similar to an office park/residential setting.	<i>LSI</i> Impacts would be similar to Alternative A. However, there would be slightly more traffic in a 1 mile (1.6 km) stretch.	<i>LSI</i> Impacts would be similar to Alternative A. However, steady state noise would be primarily due to ongoing aircraft noise. Traffic noise would be less than other alternatives.	<i>LSI</i> Impacts would be similar to Alternative A. However, steady state noise would primarily be from traffic noise near gates.	<i>LSI</i> Finegayan cantonment would have similar impacts as Alternative A. AAFB family housing would have similar impacts as Alternative C. Steady state noise would be primarily due to ongoing aircraft noise.	<i>SI-M</i> Significant operational impacts under No-Action Alternative would occur as a result of traffic noise.  <i>Potential Mitigation Measures</i> <b>Traffic noise would be reduced using sound walls at selected locations where the impacts are greatest and would reduce noise impacts to less than significant levels.</b>
<b>AIRSPACE</b>					
<b>Construction Impacts</b>	<b>Construction Impacts</b>	<b>Construction Impacts</b>	<b>Construction Impacts</b>	<b>Construction Impacts</b>	<b>Construction Impacts</b>
<i>NI</i> Construction associated with the cantonment/family housing facilities consist of support, maintenance/storage, housing, and non-live fire training functions; there would be no changes to airspace.	<i>NI</i> Impacts would be similar to Alternative A.	<i>NI</i> Impacts would be similar to Alternative A.	<i>NI</i> Impacts would be similar to Alternative A.	<i>NI</i> Impacts would be similar to Alternative A.	<i>NI</i> Impacts would be similar to Alternative A.
<b>Operation Impacts</b>	<b>Operation Impacts</b>	<b>Operation Impacts</b>	<b>Operation Impacts</b>	<b>Operation Impacts</b>	<b>Operation Impacts</b>
<i>NI</i> Operation and functions associated with the cantonment/family housing facilities consist of support, maintenance/storage, housing, and non-live fire training functions; there would be no changes to airspace.	<i>NI</i> Impacts would be similar to Alternative A.	<i>NI</i> Impacts would be similar to Alternative A.	<i>NI</i> Impacts would be similar to Alternative A.	<i>NI</i> Impacts would be similar to Alternative A.	<i>NI</i> Impacts would be similar to Alternative A.

Legend: *SI* = significant impact; *SI-M* = significant impact-mitigable; *LSI* = less than significant impact; *NI* = no impact; *BI* = beneficial impact.

**Table 4.7-1. Summary of Impacts and Potential Mitigation Measures for the Cantonment/Family Housing Alternatives**

<i>Finegayan (Alternative A)</i>	<i>Finegayan/South Finegayan (Alternative B)</i>	<i>Andersen Air Force Base (Alternative C)</i>	<i>Barrigada (Alternative D)</i>	<i>Finegayan/Andersen Air Force Base (Alternative E)</i>	<i>No-Action Alternative</i>
<b>LAND AND SUBMERGED LAND USE</b>					
<b>Construction Impacts</b>	<b>Construction Impacts</b>	<b>Construction Impacts</b>	<b>Construction Impacts</b>	<b>Construction Impacts</b>	<b>Construction Impacts</b>
<i>NI</i> There would be changes to land use initiated during construction; however, all changes in land use are considered long-term operational impacts. Therefore, there is no construction-phase analysis for this resource. See operational impacts.	<i>NI</i> Impacts would be similar to Alternative A.	<i>NI</i> Impacts would be similar to Alternative A.	<i>NI</i> Impacts would be similar to Alternative A.	<i>NI</i> Impacts would be similar to Alternative A.	<i>NI</i> Impacts would be similar to Alternative A.
<b>Operation Impacts</b>	<b>Operation Impacts</b>	<b>Operation Impacts</b>	<b>Operation Impacts</b>	<b>Operation Impacts</b>	<b>Operation Impacts</b>
<u>Loss of Valued Use</u> <i>NI</i> No change to a land use valued by the community.	<u>Loss of Valued Use</u> <i>NI</i> Impacts would be similar to Alternative A.	<u>Loss of Valued Use</u> <i>NI</i> Impacts would be similar to Alternative A.	<u>Loss of Valued Use</u> <i>NI</i> Impacts would be similar to Alternative A.	<u>Loss of Valued Use</u> <i>NI</i> Impacts would be similar to Alternative A.	<u>Loss of Valued Use</u> <i>NI</i> Impacts would be similar to Alternative A.
<u>Public Access</u> <i>NI</i> There would be no new access restrictions imposed on the public.	<u>Public Access</u> <i>SI-M</i> Short- and long-term direct impact from restriction of public access to Latte Stone Park. This alternative would have a greater impact than Alternatives A, C, D, or E.  <b>Potential Mitigation Measures</b> <b>The DoD would work with the community to provide access to Latte Stone Park to the extent practicable.</b>	<u>Public Access</u> <i>NI</i> Impacts would be similar to Alternative A.	<u>Public Access</u> <i>NI</i> Public access to the ballfield in the southern portion of the site would be restricted; however, The new access restriction is not considered an impact because the ballfield is not unique and there are other ballfields in proximity.	<u>Public Access</u> <i>NI</i> Impacts would be similar to Alternative A.	<u>Public Access</u> <i>SI</i> Direct long-term unmitigable impact due to public access restrictions to the jogging trail at Former FAA parcel.  <i>SI-M</i> New public access restrictions to the Latte Stone Park at South Finegayan.  <b>Potential Mitigation Measures</b> <b>The DoD would work with the community to provide access to Latte Stone Park to the extent practicable.</b>
<u>Compatibility with Current and Future Use</u> <i>LSI</i> Long-term impact from increase in land use density and decrease in open space on-base.  <i>NI</i> Compatible with existing and proposed land uses in the vicinity.	<u>Compatibility with Current and Future Use</u> <i>LSI</i> Impacts would be similar to Alternative A, except more open space would remain at Finegayan.  <i>NI</i> Impacts would be similar to Alternative A.	<u>Compatibility with Current and Future Use</u> <i>LSI</i> The land use density would increase on-base with a decrease in open space. There would be more of an impact within the installation boundary than other alternatives but there would be a less than significant impact on the adjacent community, similar to Alternative A.  <i>LSI</i> The long-term impact of the existing noise levels at AAFB on the proposed housing would be less than significant.	<u>Compatibility with Current and Future Use</u> <i>LSI</i> Impacts would be similar to Alternative A.  <i>NI</i> Impacts would be similar to Alternative A.	<u>Compatibility with Current and Future Use</u> <i>LSI</i> Impacts would be similar to Alternative A.  <i>LSI</i> Impacts would be similar to Alternative C.	<u>Compatibility with Current and Future Use</u> <i>LSI</i> Impacts would be similar to Alternative A.  <i>NI</i> Impacts would be similar to Alternative A.
<b>RECREATIONAL RESOURCES</b>					
<b>Construction Impacts</b>	<b>Construction Impacts</b>	<b>Construction Impacts</b>	<b>Construction Impacts</b>	<b>Construction Impacts</b>	<b>Construction Impacts</b>
<i>LSI</i> Short-term slowed access to recreational resources during the construction phase with use of public roads by construction vehicles.	<i>LSI</i> Impacts would be similar to Alternative A.	<i>LSI</i> Impacts would be similar to Alternative A.	<i>LSI</i> Impacts would be similar to Alternative A.	<i>LSI</i> Impacts would be similar to Alternative A.	<i>LSI</i> Impacts would be similar to Alternative A.

Legend: *SI* = significant impact; *SI-M* = significant impact-mitigable; *LSI* = less than significant impact; *NI* = no impact; *BI* = beneficial impact.

**Table 4.7-1. Summary of Impacts and Potential Mitigation Measures for the Cantonment/Family Housing Alternatives**

<i>Finegayan (Alternative A)</i>	<i>Finegayan/South Finegayan (Alternative B)</i>	<i>Andersen Air Force Base (Alternative C)</i>	<i>Barrigada (Alternative D)</i>	<i>Finegayan/Andersen Air Force Base (Alternative E)</i>	<i>No-Action Alternative</i>
<b>Operation Impacts</b>	<b>Operation Impacts</b>	<b>Operation Impacts</b>	<b>Operation Impacts</b>	<b>Operation Impacts</b>	<b>Operation Impacts</b>
<p><i>LSI</i> Considerably smaller number of Marines and dependents representing recreational users. Direct impacts from long-term increase in user demand of recreational resources and accelerated deterioration of resources. Impacts would be less than Alternative D (which has the greatest impact).</p>	<p><i>LSI</i> Impacts would be similar to Alternative A, except there would also be impacts to Latte Stone Park. Impacts would be less than Alternative D (which has the greatest impact).</p>	<p><i>LSI</i> Impacts would be similar to Alternative A.</p>	<p><i>SI</i> Direct impacts from removal of Eagle Field from public use could result in a long-term significant impact to recreational resources in central Guam.</p> <p><i>Potential Mitigation Measures</i> Mitigation measures have not been identified at this time.</p>	<p><i>LSI</i> Impacts would be similar to Alternative A.</p>	<p><i>SI-M</i> Reduction of recreational opportunities off-base due to the increase in the number of users. Accelerated deterioration of resources. Diminished user satisfaction due to reduced recreational opportunities. Conflicts between users and uses.</p> <p><i>Potential Mitigation Measures</i> GovGuam to update Guam Comprehensive Outdoor Recreation Plan that addresses recreational user use, demand, preference, conflicts, and conditions. (This measure would fall within GovGuam authority to implement). Collaborate with the GDAWR to establish outreach programs and docent (person who leads guided tours) programs for the five marine preserves and other environmentally sensitive areas on Guam. Provide for improvements and maintenance of federally owned portions of Tanguisson Beach, along with the management of the coastline to the north of Hilaan that contains significant natural, cultural, scenic, and recreational resources.</p>
<b>TERRESTRIAL BIOLOGICAL RESOURCES</b>					
<b>Construction Impacts</b>	<b>Construction Impacts</b>	<b>Construction Impacts</b>	<b>Construction Impacts</b>	<b>Construction Impacts</b>	<b>Construction Impacts</b>
<p><u>Vegetation</u> <i>SI-M</i> Conversion of 1,007 acres (408 ha) of limestone forest to developed area.</p> <p><i>Potential Mitigation Measures</i> Forest enhancement on a minimum of 1,007 acres (408 ha) of limestone forest.</p>	<p><u>Vegetation</u> <i>SI-M</i> Conversion of 815 acres (330 ha) of limestone forest to developed area.</p> <p><i>Potential Mitigation Measures</i> Forest enhancement on a minimum of 815 acres (330 ha) of limestone forest.</p>	<p><u>Vegetation</u> <i>SI-M</i> Conversion of 1,177 acres (476 ha) of limestone forest to developed area.</p> <p><i>Potential Mitigation Measures</i> Forest enhancement on a minimum of 1,177 acres (476 ha) of limestone forest.</p>	<p><u>Vegetation</u> <i>SI-M</i> Conversion of 231 acres (94 ha) of limestone forest to developed area.</p> <p><i>Potential Mitigation Measures</i> Forest enhancement on a minimum of 231 acres (94 ha) of limestone forest.</p>	<p><u>Vegetation</u> <i>SI-M</i> Conversion of 780 acres (316 ha) of limestone forest to developed area.</p> <p><i>Potential Mitigation Measures</i> Forest enhancement on a minimum of 780 acres (316 ha) of limestone forest.</p>	<p><u>Vegetation</u> <i>SI-M</i> Conversion of 1,336 acres (541 ha) of limestone forest to developed area.</p> <p><i>Potential Mitigation Measures</i> See the 2010 Final EIS, Volume 7, Chapter 2: Overview of Best Management Practices and Proposed Mitigation Measures, Table 2.2-1: Summary of Proposed Mitigation Measures (mitigations specific to Volume 2), Pages 2-25-2-45.</p>

Legend: *SI* = significant impact; *SI-M* = significant impact-mitigable; *LSI* = less than significant impact; *NI* = no impact; *BI* = beneficial impact.

**Table 4.7-1. Summary of Impacts and Potential Mitigation Measures for the Cantonment/Family Housing Alternatives**

<i>Finegayan (Alternative A)</i>	<i>Finegayan/South Finegayan (Alternative B)</i>	<i>Andersen Air Force Base (Alternative C)</i>	<i>Barrigada (Alternative D)</i>	<i>Finegayan/Andersen Air Force Base (Alternative E)</i>	<i>No-Action Alternative</i>
<p><u>Terrestrial Conservation Areas</u> <b>SI-M</b> Conversion of 1,243 acres (503 ha) of Overlay Refuge lands to developed area.</p> <p><b>Potential Mitigation Measures</b></p> <ul style="list-style-type: none"> <li>• Submit a proposal to designate an ERA on NAVMAG.</li> <li>• Submit a proposal for the expansion of Orote Peninsula ERA.</li> </ul> <p><b>NI</b> Haputo ERA - Haputo ERA would not be directly impacted; use of Haputo ERA would not increase as a result of construction activities.</p>	<p><u>Terrestrial Conservation Areas</u> <b>SI-M</b> Conversion of 947 acres (383 ha) of Overlay Refuge lands to developed area.</p> <p><b>Potential Mitigation Measures</b> Mitigation would be the same as under Alternative A.</p> <p><b>NI</b> Haputo ERA - Haputo ERA would not be directly impacted; use of Haputo ERA would not increase as a result of construction activities.</p>	<p><u>Terrestrial Conservation Areas</u> <b>SI-M</b> Conversion of 894 acres (362 ha) of Overlay Refuge lands to developed area.</p> <p><b>Potential Mitigation Measures</b> Mitigation would be the same as under Alternative A.</p>	<p><u>Terrestrial Conservation Areas</u> <b>LSI</b> Conversion of 48 acres (19 ha) of Overlay Refuge lands to developed area within the support areas.</p>	<p><u>Terrestrial Conservation Areas</u> <b>SI-M</b> Conversion of 1,065 acres (431 ha) of Overlay Refuge lands to developed area.</p> <p><b>Potential Mitigation Measures</b> Mitigation would be the same as under Alternative A.</p> <p><b>NI</b> Haputo ERA - Haputo ERA would not be directly impacted; use of Haputo ERA would not increase as a result of construction activities.</p>	<p><u>Terrestrial Conservation Areas</u> <b>SI-M</b> Conversion of 1,129 acres (453 ha) of Overlay Refuge lands to developed area.</p> <p><b>Potential Mitigation Measures</b> See the 2010 Final EIS, Volume 7, Chapter 2: Overview of Best Management Practices and Proposed Mitigation Measures, Table 2.2-1: Summary of Proposed Mitigation Measures (mitigations specific to Volume 2), Pages 2-25-2-45.</p>
<p><u>Native Wildlife</u> <b>LSI</b> Direct impacts to 1,160 acres (469 ha) of potential wildlife habitat. Wildlife currently present is either widespread on Guam or prefers open spaces, which would not be reduced. With implementation of BMPs, potential introduction of new or spread of existing non-native species on Guam during proposed construction activities is considered unlikely.</p>	<p><u>Native Wildlife</u> <b>LSI</b> No additional impacts to native wildlife species from construction beyond those described for Alternative A would occur under Alternative B. Wildlife currently present is either widespread on Guam or prefers open spaces, which would not be reduced. With implementation of BMPs, potential introduction of new or spread of existing non-native species on Guam during the proposed construction activities is considered unlikely.</p>	<p><u>Native Wildlife</u> <b>LSI</b> Direct impacts to 1,266 acres (512 ha) of potential wildlife habitat. Wildlife currently present is either widespread on Guam or prefers open spaces, which would not be reduced. With implementation of BMPs, potential introduction of new or spread of existing non-native species on Guam during the proposed short-term construction activities is considered unlikely.</p>	<p><u>Native Wildlife</u> <b>LSI</b> Direct impacts to 991 acres (401 ha) of potential wildlife habitat. Wildlife currently present is either widespread on Guam or prefers open spaces, which would not be reduced. With implementation of BMPs, potential introduction of new or spread of existing non-native species on Guam during the proposed short-term construction activities is considered unlikely.</p>	<p><u>Native Wildlife</u> <b>LSI</b> Direct impacts to 912 acres (369 ha) of potential wildlife habitat. Wildlife currently present is either widespread on Guam or prefers open spaces, which would not be reduced. With implementation of BMPs, potential introduction of new or spread of existing non-native species on Guam during proposed construction activities is considered unlikely.</p>	<p><u>Native Wildlife</u> <b>LSI</b> Direct impacts to 1,611 acres (652 ha) of potential wildlife habitat. Wildlife currently present is either widespread on Guam or prefers open spaces, which would not be reduced. With implementation of BMPs, potential introduction of new or spread of existing non-native species on Guam during the proposed short-term construction activities is considered unlikely.</p>
<p><u>Special-Status Species – Federal ESA-Listed and Proposed Species</u> <b>SI-M</b> Mariana fruit bat - impacts to 957 acres (387 ha) of fruit bat recovery habitat. Mariana crow - impacts to 957 acres (387 ha) of crow recovery habitat. Guam rail - impacts to 500 acres (202 ha) of rail recovery habitat. Guam Micronesian kingfisher - impacts to 957 acres (387 ha) of kingfisher recovery habitat. <i>Serianthes</i> tree - impacts to 634 acres (257 ha) of <i>Serianthes</i> recovery habitat.</p> <p><b>Potential Mitigation Measures</b></p> <ul style="list-style-type: none"> <li>• Implementation of the potential mitigation measures under Construction Impacts, Vegetation would also benefit these species.</li> <li>• Brown treesnake research and suppression.</li> </ul>	<p><u>Special-Status Species – Federal ESA-Listed and Proposed Species</u> <b>SI-M</b> Mariana fruit bat - impacts to 754 acres (305 ha) of fruit bat recovery habitat. Mariana crow - impacts to 754 acres (305 ha) of crow recovery habitat. Guam rail - impacts to 571 acres (231 ha) of rail recovery habitat. Guam Micronesian kingfisher - impacts to 754 acres (305 ha) of kingfisher recovery habitat. <i>Serianthes</i> tree - impacts to 619 acres (250 ha) of <i>Serianthes</i> recovery habitat.</p> <p><b>Potential Mitigation Measures</b></p> <ul style="list-style-type: none"> <li>• Implementation of the potential mitigation measures under Construction Impacts, Vegetation would also benefit these species.</li> <li>• Brown treesnake research and suppression.</li> </ul>	<p><u>Special-Status Species – Federal ESA-Listed and Proposed Species</u> <b>SI-M</b> Mariana fruit bat - impacts to 1,159 acres (469 ha) of fruit bat recovery habitat. Mariana crow - impacts to 1,162 acres (470 ha) of crow recovery habitat. Guam rail - impacts to 228 acres (92 ha) of rail recovery habitat. Guam Micronesian kingfisher - impacts to 1,159 acres (469 ha) of kingfisher recovery habitat. <i>Serianthes</i> tree - impacts to 1,093 acres (442 ha) of <i>Serianthes</i> recovery habitat.</p> <p><b>Potential Mitigation Measures</b></p> <ul style="list-style-type: none"> <li>• Implementation of the potential mitigation measures under Construction Impacts, Vegetation would also benefit these species.</li> <li>• Brown treesnake research and suppression.</li> </ul>	<p><u>Special-Status Species – Federal ESA-Listed and Proposed Species</u> <b>SI-M</b> Guam rail - impacts to 864 acres (350 ha) of rail recovery habitat. Guam tree snail - impacts to 266 acres (107 ha) of limestone forest.</p> <p><b>Potential Mitigation Measures</b></p> <ul style="list-style-type: none"> <li>• Implementation of the potential mitigation measures under Construction Impacts, Vegetation would also benefit these species.</li> <li>• Brown treesnake research and suppression.</li> </ul>	<p><u>Special-Status Species – Federal ESA-Listed and Proposed Species</u> <b>SI-M</b> Mariana fruit bat - impacts to 719 acres (291 ha) of fruit bat recovery habitat. Mariana crow - impacts to 719 acres (291 ha) of crow recovery habitat. Guam rail - impacts to 507 acres (205 ha) of rail recovery habitat. Guam Micronesian kingfisher - impacts to 719 acres (291 ha) of kingfisher recovery habitat. <i>Serianthes</i> tree - impacts to 648 acres (262 ha) of <i>Serianthes</i> recovery habitat.</p> <p><b>Potential Mitigation Measures</b></p> <ul style="list-style-type: none"> <li>• Implementation of the potential mitigation measures under Construction Impacts, Vegetation would also benefit these species.</li> <li>• Brown treesnake research and suppression.</li> </ul>	<p><u>Special-Status Species – Federal ESA-Listed and Proposed Species</u> <b>SI-M</b> Mariana fruit bat - impacts to 1,248 acres (505 ha) of fruit bat recovery habitat. Mariana crow - impacts to 1,248 acres (505 ha) of crow recovery habitat. Guam rail - impacts to 654 acres (265 ha) of rail recovery habitat. Guam Micronesian kingfisher - impacts to 1,248 acres (505 ha) of kingfisher recovery habitat. <i>Serianthes</i> tree - impacts to 358 acres (144 ha) of <i>Serianthes</i> recovery habitat.</p> <p><b>Potential Mitigation Measures</b> See the 2010 Final EIS, Volume 7, Chapter 2: Overview of Best Management Practices and Proposed Mitigation Measures, Table 2.2-1: Summary of Proposed Mitigation Measures (mitigations specific to Volume 2), Pages 2-25-2-45.</p>

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**Table 4.7-1. Summary of Impacts and Potential Mitigation Measures for the Cantonment/Family Housing Alternatives**

<i>Finegayan (Alternative A)</i>	<i>Finegayan/South Finegayan (Alternative B)</i>	<i>Andersen Air Force Base (Alternative C)</i>	<i>Barrigada (Alternative D)</i>	<i>Finegayan/Andersen Air Force Base (Alternative E)</i>	<i>No-Action Alternative</i>
<p><b>LSI</b> Sea turtles and ESA proposed species - implementation of BMPs would avoid and minimize impacts to ESA proposed species; implementation of BMPs (e.g., shielded lights) would avoid and minimize impacts to coastal areas and sea turtles.</p> <p><b>NI</b> Tree snails -located only within Haputo ERA which would not be impacted.</p>	<p><b>LSI</b> Sea turtles and ESA proposed species - implementation of BMPs would avoid and minimize impacts to ESA proposed species; implementation of BMPs (e.g., shielded lights) would avoid and minimize impacts to coastal areas and sea turtles.</p> <p><b>NI</b> Tree snails - located only within Haputo ERA which would not be impacted.</p>	<p><b>LSI</b> Sea turtles and ESA proposed species - implementation of BMPs would avoid and minimize impacts to ESA proposed species; implementation of BMPs (e.g., shielded lights) would avoid and minimize impacts to coastal areas and sea turtles.</p>	<p><b>LSI</b> Mariana fruit bat - impacts to 48 acres (19 ha) of fruit bat recovery habitat. Mariana crow - impacts to 48 acres (19 ha) of crow recovery habitat. Guam Micronesian kingfisher - impacts to 48 acres (19 ha) of kingfisher recovery habitat. <i>Serianthes</i> tree - impacts to 41 acres (17 ha) of <i>Serianthes</i> recovery habitat. Mariana common moorhen - loss of golf course pond previously used by moorhen would be less than significant impact. ESA proposed species - implementation of BMPs would avoid and minimize impacts to ESA proposed species.</p>	<p><b>LSI</b> Sea turtles and ESA proposed species - implementation of BMPs would avoid and minimize impacts to ESA proposed species; implementation of BMPs (e.g., shielded lights) would avoid and minimize impacts to coastal areas and sea turtles.</p> <p><b>NI</b> Tree snails - located only within Haputo ERA which would not be impacted.</p>	<p><b>LSI</b> Mariana eight-spot butterfly - butterflies or host plants not found in impacted areas; implementation of BMPs would avoid and minimize impacts to butterflies, host plants, and sea turtles.</p> <p><b>NI</b> Tree snails -located only within Haputo ERA which would not be impacted.</p>
<p><b>Special-Status Species - Guam-Listed and SOGCN</b> <b>SI-M</b> Impacts and mitigations associated with Guam-listed species that are also federally listed would be the same as described above for those species. Impacts to other Guam-listed species are described below.</p> <p><b>SI-M</b> Moth skink and Pacific slender-toed gecko – loss of 1,007 acres (408 ha) of occupied habitat.</p> <p><b>Potential Mitigation Measures</b> <b>Implementation of the potential mitigation measures under Construction Impacts, Vegetation would also benefit these species.</b></p> <p><b>NI</b> Micronesian starling, white-throated ground dove - species are very rarely recorded within project areas.</p>	<p><b>Special-Status Species - Guam-Listed and SOGCN</b> <b>SI-M</b> Impacts and mitigations associated with Guam-listed species that are also federally listed would be the same as described above for those species. Impacts to other Guam-listed species are described below.</p> <p><b>SI-M</b> Moth skink and Pacific slender-toed gecko – loss of 815 acres (330 ha) of occupied habitat.</p> <p><b>Potential Mitigation Measures</b> <b>Implementation of the potential mitigation measures under Construction Impacts, Vegetation would also benefit these species.</b></p> <p><b>NI</b> Impacts would be similar to Alternative A.</p>	<p><b>Special-Status Species - Guam-Listed and SOGCN</b> <b>SI-M</b> Impacts and mitigations associated with Guam-listed species that are also federally listed would be the same as described above for those species. Impacts to other Guam-listed species are described below.</p> <p><b>LSI</b> Micronesian starling - temporary loss of a portion of existing urban habitat. Moth skink - known occurrence only within proposed AAFB utility corridor.</p> <p><b>NI</b> Impacts would be similar to Alternative A.</p>	<p><b>Special-Status Species - Guam-Listed and SOGCN</b> <b>SI-M</b> Impacts and mitigations associated with Guam-listed species that are also federally listed would be the same as described above for those species. Impacts to other Guam-listed species are described below.</p> <p><b>LSI</b> Moth skink - species does not occur within Barrigada; known occurrence only within proposed AAFB utility corridor.</p> <p><b>NI</b> Micronesian starling - species does not occur in project areas.</p>	<p><b>Special-Status Species - Guam-Listed and SOGCN</b> <b>SI-M</b> Impacts and mitigations associated with Guam-listed species that are also federally listed would be the same as described above for those species. Impacts to other Guam-listed species are described below.</p> <p><b>SI-M</b> Moth skink and Pacific slender-toed gecko – loss of 780 acres (316 ha) of occupied habitat.</p> <p><b>Potential Mitigation Measures</b> <b>Implementation of the potential mitigation measures under Construction Impacts, Vegetation would also benefit these species.</b></p> <p><b>LSI</b> Micronesian starling - temporary loss of portion of existing urban habitat. Moth skink - known occurrence only within proposed AAFB utility corridor.</p> <p><b>NI</b> White-throated ground dove - species does not occur within project areas.</p>	<p><b>Special-Status Species - Guam-Listed and SOGCN</b> <b>SI-M</b> Impacts and mitigations associated with Guam-listed species that are also federally listed would be the same as described above for those species. Impacts to other Guam-listed species are described below.</p> <p><b>SI-M</b> Moth skink and Pacific slender-toed gecko – loss of 1,336 acres (541 ha) of occupied habitat.</p> <p><b>Potential Mitigation Measures</b> <b>See the 2010 Final EIS, Volume 7, Chapter 2: Overview of Best Management Practices and Proposed Mitigation Measures, Table 2.2-1: Summary of Proposed Mitigation Measures (mitigations specific to Volume 2), Pages 2-25-2-45.</b></p> <p><b>NI</b> Micronesian starling, white-throated ground dove - species do not occur within project areas.</p>

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**Table 4.7-1. Summary of Impacts and Potential Mitigation Measures for the Cantonment/Family Housing Alternatives**

<i>Finegayan (Alternative A)</i>	<i>Finegayan/South Finegayan (Alternative B)</i>	<i>Andersen Air Force Base (Alternative C)</i>	<i>Barrigada (Alternative D)</i>	<i>Finegayan/Andersen Air Force Base (Alternative E)</i>	<i>No-Action Alternative</i>
<b>Operation Impacts</b>	<b>Operation Impacts</b>	<b>Operation Impacts</b>	<b>Operation Impacts</b>	<b>Operation Impacts</b>	<b>Operation Impacts</b>
<u>Vegetation</u> <b>LSI</b> With implementation of BMPs, potential introduction of new or spread of existing non-native species on Guam during operations of cantonment/ housing area is considered unlikely.	<u>Vegetation</u> <b>LSI</b> Impacts would be similar to Alternative A.	<u>Vegetation</u> <b>LSI</b> Impacts would be similar to Alternative A.	<u>Vegetation</u> <b>LSI</b> Impacts would be similar to Alternative A.	<u>Vegetation</u> <b>LSI</b> Impacts would be similar to Alternative A.	<u>Vegetation</u> <b>LSI</b> Impacts would be similar to Alternative A.
<u>Terrestrial Conservation Areas</u> <b>SI-M</b> Haputo ERA - potential increased usage by military and civilian personnel.  <b>Potential Mitigation Measures</b> • <b>Fencing.</b> • <b>Info/educational signage.</b> • <b>Educational materials regarding sensitive biological resources.</b> • <b>Monitoring of visitor use.</b>	<u>Terrestrial Conservation Areas</u> <b>SI-M</b> Haputo ERA - potential increased usage by military and civilian personnel.  <b>Potential Mitigation Measures</b> <b>Mitigation would be the same as under Alternative A.</b>	<u>Terrestrial Conservation Areas</u>	<u>Terrestrial Conservation Areas</u>	<u>Terrestrial Conservation Areas</u> <b>SI-M</b> Haputo ERA - potential increased usage by military and civilian personnel.  <b>Potential Mitigation Measures</b> <b>Mitigation would be the same as under Alternative A.</b>	<u>Terrestrial Conservation Areas</u> <b>LSI</b> Although Overlay Refuge-specific BMPs were not identified within the 2010 Final EIS, BMPs proposed for other terrestrial biological resources would be applicable and relevant to avoid and minimize impacts to Overlay Refuge lands.
<b>NI</b> Overlay Refuge - with implementation of BMPs, there would be no impacts to Overlay Refuge from operations.	<b>NI</b> Impacts would be similar to Alternative A.	<b>NI</b> Impacts would be similar to Alternative A.	<b>NI</b> No terrestrial conservation areas within Barrigada.	<b>NI</b> Impacts would be similar to Alternative A.	
<u>Native Wildlife</u> <b>LSI</b> With implementation of BMPs, potential impacts to wildlife from operations would be reduced to less than significant.	<u>Native Wildlife</u> <b>LSI</b> Impacts would be similar to Alternative A.	<u>Native Wildlife</u> <b>LSI</b> Impacts would be similar to Alternative A.	<u>Native Wildlife</u> <b>LSI</b> Impacts would be similar to Alternative A.	<u>Native Wildlife</u> <b>LSI</b> Impacts would be similar to Alternative A.	<u>Native Wildlife</u> <b>LSI</b> Impacts would be similar to Alternative A.
<u>Special-Status Species – Federal ESA-Listed and Proposed Species</u> <b>SI-M</b> Mariana fruit bat - impacts to fruit bat habitat due to operations (e.g., lights, noise, human activity).  <b>Potential Mitigation Measures</b> • <b>Haputo ERA - fencing, info/educational signage, educational materials regarding sensitive biological resources, and monitoring of visitor use.</b> • <b>Continued implementation of the potential mitigation measures under Construction Impacts, Vegetation would also benefit the Mariana fruit bat.</b>	<u>Special-Status Species – Federal ESA-Listed and Proposed Species</u> <b>SI-M</b> Mariana fruit bat - impacts to fruit bat habitat due to operations (e.g., lights, noise, human activity).  <b>Potential Mitigation Measures</b> • <b>Haputo ERA - fencing, info/educational signage, educational materials regarding sensitive biological resources, and monitoring of visitor use.</b> • <b>Continued implementation of the potential mitigation measures under Construction Impacts, Vegetation would also benefit the Mariana fruit bat.</b>	<u>Special-Status Species – Federal ESA-Listed and Proposed Species</u> <b>SI-M</b> Mariana fruit bat - impacts to fruit bat habitat due to operations (e.g., lights, noise, human activity).  <b>Potential Mitigation Measures</b> <b>Continued implementation of the potential mitigation measures under Construction Impacts, Vegetation would also benefit the Mariana fruit bat.</b>	<u>Special-Status Species – Federal ESA-Listed and Proposed Species</u>	<u>Special-Status Species – Federal ESA-Listed and Proposed Species</u> <b>SI-M</b> Mariana fruit bat - impacts to fruit bat habitat due to operations (e.g., lights, noise, human activity).  <b>Potential Mitigation Measures</b> • <b>Haputo ERA - fencing, info/educational signage, educational materials regarding sensitive biological resources, and monitoring of visitor use.</b> • <b>Continued implementation of the potential mitigation measures under Construction Impacts, Vegetation would also benefit the Mariana fruit bat.</b>	<u>Special-Status Species – Federal ESA-Listed and Proposed Species</u> <b>SI-M</b> Mariana fruit bat. Mariana crow, Guam Micronesian kingfisher, Guam rail - impacts to habitat due to operations (e.g., lights, noise, human activity).  <b>Potential Mitigation Measures</b> <b>See the 2010 Final EIS, Volume 7, Chapter 2: Overview of Best Management Practices and Proposed Mitigation Measures, Table 2.2-1: Summary of Proposed Mitigation Measures (mitigations specific to Volume 2), Pages 2-25-2-45.</b>
<b>NI</b> Mariana Crow, Guam Rail, and Guam Micronesian Kingfisher - no impacts as these species no longer occur in the wild on Guam. <b>LSI</b> Sea turtles - implementation of BMPs (e.g., shielded lights) would avoid and minimize impacts to coastal areas; implementation of potential mitigation measures for Vegetation and Terrestrial Conservation Areas would also benefit sea turtles.	<b>NI</b> Mariana Crow, Guam Rail, and Guam Micronesian Kingfisher - no impacts as these species no longer occur in the wild on Guam. <b>LSI</b> Impacts would be similar to Alternative A.	<b>NI</b> Mariana Crow, Guam Rail, and Guam Micronesian Kingfisher - no impacts as these species no longer occur in the wild on Guam. <b>LSI</b> Sea turtles - suitable beach habitat not within impacted areas; implementation of BMPs (e.g., shielded lights) would avoid and minimize impacts to coastal areas.	<b>NI</b> Mariana Crow, Guam Rail, and Guam Micronesian Kingfisher - no impacts as these species no longer occur in the wild on Guam.	<b>NI</b> Mariana Crow, Guam Rail, and Guam Micronesian Kingfisher - no impacts as these species no longer occur in the wild on Guam. <b>LSI</b> Impacts would be similar to Alternative A.	<b>LSI</b> Sea turtles, tree snails - species only found within Haputo ERA; implementation of potential mitigation measures for fruit bat would benefit sea turtles and tree snails.

Legend: **SI** = significant impact; **SI-M** = significant impact-mitigable; **LSI** = less than significant impact; **NI** = no impact; **BI** = beneficial impact.

**Table 4.7-1. Summary of Impacts and Potential Mitigation Measures for the Cantonment/Family Housing Alternatives**

<i>Finegayan (Alternative A)</i>	<i>Finegayan/South Finegayan (Alternative B)</i>	<i>Andersen Air Force Base (Alternative C)</i>	<i>Barrigada (Alternative D)</i>	<i>Finegayan/Andersen Air Force Base (Alternative E)</i>	<i>No-Action Alternative</i>
<i>NI</i> ESA-proposed species - cantonment/housing operations would not impact ESA-proposed species. <i>Serianthes</i> tree - no operational impacts to <i>Serianthes</i> or recovery habitat due to cantonment/housing operations.	<i>NI</i> Impacts would be similar to Alternative A.	<i>NI</i> Impacts would be similar to Alternative A.	<i>NI</i> Mariana common moorhen, Guam tree snail -, no suitable habitat would occur within Barrigada after construction.	<i>NI</i> Impacts would be similar to Alternative A.	<i>NI</i> Mariana eight-spot butterfly - cantonment/housing operations would not impact butterflies or host plants. <i>Serianthes</i> tree - no operational impacts to <i>Serianthes</i> or recovery habitat due to cantonment/housing operations.
<u>Special-Status Species - Guam-Listed and SOGCN</u> Impacts to Guam-listed species that are also federally listed would be the same as described above for those species. Impacts to other Guam-listed species are described below. <i>NI</i> Micronesian starling, white-throated ground dove - species do not occur within project area. Moth skink, Pacific slender-toed gecko - cantonment/housing operations would not impact these species.	<u>Special-Status Species - Guam-Listed and SOGCN</u> Impacts to Guam-listed species that are also federally listed would be the same as described above for those species. Impacts to other Guam-listed species are described below. <i>NI</i> Impacts would be similar to Alternative A.	<u>Special-Status Species - Guam-Listed and SOGCN</u> Impacts to Guam-listed species that are also federally listed would be the same as described above for those species. Impacts to other Guam-listed species are described below. <i>NI</i> Micronesian starling, moth skink - cantonment/housing operations would not impact these species. White-throated ground dove - species does not occur within project area.	<u>Special-Status Species - Guam-Listed and SOGCN</u> Impacts to Guam-listed species that are also federally listed would be the same as described above for those species. Impacts to other Guam-listed species are described below. <i>NI</i> Micronesian starling, moth skink - cantonment/housing operations would not impact these species.	<u>Special-Status Species - Guam-Listed and SOGCN</u> Impacts to Guam-listed species that are also federally listed would be the same as described above for those species. Impacts to other Guam-listed species are described below. <i>NI</i> Micronesian starling, moth skink - cantonment/housing operations would not impact these species. White-throated ground dove - species does not occur within project area.	<u>Special-Status Species - Guam-Listed and SOGCN</u> Impacts to Guam-listed species that are also federally listed would be the same as described above for those species. Impacts to other Guam-listed species are described below. <i>NI</i> Moth skink, Pacific slender-toed gecko, - cantonment/housing operations would not impact these species.
<b>MARINE BIOLOGICAL RESOURCES</b>					
<b>Construction Impacts</b>	<b>Construction Impacts</b>	<b>Construction Impacts</b>	<b>Construction Impacts</b>	<b>Construction Impacts</b>	<b>Construction Impacts</b>
<u>Marine Flora and Invertebrates</u> <i>SI</i> Increasing wastewater discharge from a non-compliant treatment plant would result in significant and unmitigable indirect impacts to marine flora and invertebrates during the period of non-compliance. Upgrading the Northern District WWTP treatment systems (as required by the 2013 NPDES permit) would mitigate the significant indirect impacts once the upgrades are completed. Until the WWTP upgrades are completed (anticipated to be early in the operational phase of the proposed action) there would be an indirect and unmitigable significant impact to nearshore waters during construction. <i>LSI</i> Potential indirect impacts on marine flora and invertebrates may occur from increased recreational use (damage to reefs typically caused by anchors, reef-walkers, or reckless scuba diving, snorkeling, and fishing activities) by the construction workforce, but are avoided or minimized to less than significant impacts with the implementation of BMPs.	<u>Marine Flora and Invertebrates</u> <i>SI</i> Impacts would be similar to Alternative A.  <i>LSI</i> Impacts would be similar to Alternative A, except slightly reduced since housing would be developed further from the coast, thus minimizing impact.	<u>Marine Flora and Invertebrates</u> <i>SI</i> Impacts would be similar to Alternative A.  <i>LSI</i> Impacts would be similar to Alternative A.	<u>Marine Flora and Invertebrates</u> <i>SI</i> Impacts would be similar to Alternative A  <i>LSI</i> Impacts would be similar to Alternative A, except slightly reduced since housing would be developed further from the coast, thus minimizing impact.	<u>Marine Flora and Invertebrates</u> <i>SI</i> Impacts would be similar to Alternative A.  <i>LSI</i> Impacts would be similar to Alternative A, except slightly reduced since the Finegayan cantonment would be developed further from the coast, thus minimizing impacts.	<u>Marine Flora and Invertebrates</u> <i>SI</i> Impacts would be similar to Alternative A.  <i>LSI</i> While less than significant impacts to marine flora and invertebrates would occur for both the No-Action Alternative and the action alternatives discussed in Chapter 4, due to the larger proposed footprint and number of the Marines and dependents that would arrive on Guam under the No-Action Alternative, impacts would be of greater intensity than those for the proposed action in this SEIS.

Legend: *SI* = significant impact; *SI-M* = significant impact-mitigable; *LSI* = less than significant impact; *NI* = no impact; *BI* = beneficial impact.



**Table 4.7-1. Summary of Impacts and Potential Mitigation Measures for the Cantonment/Family Housing Alternatives**

<i>Finegayan (Alternative A)</i>	<i>Finegayan/South Finegayan (Alternative B)</i>	<i>Andersen Air Force Base (Alternative C)</i>	<i>Barrigada (Alternative D)</i>	<i>Finegayan/Andersen Air Force Base (Alternative E)</i>	<i>No-Action Alternative</i>
<p><u>Fish</u> <b>SI</b> Increasing wastewater discharge from a non-compliant treatment plant would result in significant and unmitigable indirect impacts to fish during the period of non-compliance. Upgrading the Northern District WWTP treatment systems (as required by the 2013 NPDES permit) would mitigate the significant indirect impacts once the upgrades are completed. Until the WWTP upgrades are completed (anticipated to be early in the operational phase of the proposed action) there would be an indirect and unmitigable significant impact to nearshore waters during construction.</p> <p><b>LSI</b> Potential indirect impacts on fish may occur from increased recreational use as mentioned above, but are avoided or minimized to less than significant impacts with the implementation of BMPs.</p>	<p><u>Fish</u> <b>SI</b> Impacts would be similar to Alternative A.</p> <p><b>LSI</b> Impacts would be similar to Alternative A, except slightly reduced since housing would be developed further from the coast, thus minimizing impact.</p>	<p><u>Fish</u> <b>SI</b> Impacts would be similar to Alternative A.</p> <p><b>LSI</b> Impacts would be similar to Alternative A. In addition, AAFB permits hook and line fishing and swimming at designated locations, which reduce potential impact.</p>	<p><u>Fish</u> <b>SI</b> Impacts would be similar to Alternative A.</p> <p><b>LSI</b> Impacts would be similar to Alternative A, except slightly reduced since housing would be developed further from the coast, thus minimizing impact.</p>	<p><u>Fish</u> <b>SI</b> Impacts would be similar to Alternative A.</p> <p><b>LSI</b> Impacts would be similar to Alternative A, except slightly reduced since the Finegayan cantonment would be developed further from the coast, thus minimizing impact. In addition, AAFB permits hook and line fishing and swimming at designated locations, which reduce potential impacts.</p>	<p><u>Fish</u> <b>SI</b> Impacts would be similar to Alternative A.</p> <p><b>LSI</b> While less than significant impacts to fish would occur for both the No-Action Alternative and the action alternatives discussed in Chapter 4, due to the larger proposed footprint and number of the Marines and dependents that would arrive on Guam under the No-Action Alternative, impacts would be of greater intensity than those for the proposed action in this SEIS.</p>
<p><u>Essential Fish Habitat</u> <b>SI</b> Increasing wastewater discharge from a non-compliant treatment plant could result in significant and unmitigable indirect impacts to essential fish habitat during the period of non-compliance. Upgrading the Northern District WWTP treatment systems (as required by the 2013 NPDES permit) would mitigate the significant indirect impacts once the upgrades are completed. Until the WWTP upgrades are completed (anticipated to be early in the operational phase of the proposed action) there would be an indirect and unmitigable significant impact to nearshore waters during construction.</p> <p><b>LSI</b> Potential indirect impacts on essential fish habitat may occur from increased recreational use as mentioned above, but are avoided or minimized to less than significant impacts with the implementation of BMPs.</p>	<p><u>Essential Fish Habitat</u> <b>SI</b> Impacts would be similar to Alternative A.</p> <p><b>LSI</b> Impacts would be similar to Alternative A, except slightly reduced since housing would be developed further from the coast, thus minimizing impact.</p>	<p><u>Essential Fish Habitat</u> <b>SI</b> Impacts would be similar to Alternative A.</p> <p><b>LSI</b> Impacts would be similar to Alternative A.</p>	<p><u>Essential Fish Habitat</u> <b>SI</b> Impacts would be similar to Alternative A.</p> <p><b>LSI</b> Impacts would be similar to Alternative A, except slightly reduced since housing would be developed further from the coast, thus minimizing impact.</p>	<p><u>Essential Fish Habitat</u> <b>SI</b> Impacts would be similar to Alternative A.</p> <p><b>LSI</b> Impacts would be similar to Alternative A, except slightly reduced since the Finegayan cantonment would be developed further from the coast, thus minimizing impacts.</p>	<p><u>Essential Fish Habitat</u> <b>SI</b> Impacts would be similar to Alternative A.</p> <p><b>LSI</b> While less than significant impacts to EFH would occur for both the No-Action Alternative and the action alternatives discussed in Chapter 4, due to the larger proposed footprint and number of the Marines and dependents that would arrive on Guam under the No-Action Alternative, impacts would be of greater intensity than those for the proposed action in this SEIS.</p>

Legend: **SI** = significant impact; **SI-M** = significant impact-mitigable; **LSI** = less than significant impact; **NI** = no impact; **BI** = beneficial impact.

**Table 4.7-1. Summary of Impacts and Potential Mitigation Measures for the Cantonment/Family Housing Alternatives**

<i>Finegayan (Alternative A)</i>	<i>Finegayan/South Finegayan (Alternative B)</i>	<i>Andersen Air Force Base (Alternative C)</i>	<i>Barrigada (Alternative D)</i>	<i>Finegayan/Andersen Air Force Base (Alternative E)</i>	<i>No-Action Alternative</i>
<p><u>Special-Status Species – Federal ESA-Listed and Proposed Species</u> <b>LSI</b> Potential short-term impact to the green sea turtle from disturbance resulting from increased activity in the area. Potential indirect impact on special-status species from increased recreational use as mentioned above, but are avoided or minimized to less than significant impacts with the implementation of BMPs.</p>	<p><u>Special-Status Species – Federal ESA-Listed and Proposed Species</u> <b>LSI</b> Impacts would be similar to Alternative A, except slightly reduced since housing would be developed further from the coast, thus minimizing impact.</p>	<p><u>Special-Status Species – Federal ESA-Listed and Proposed Species</u> <b>LSI</b> Impacts would be similar to Alternative A.</p>	<p><u>Special-Status Species – Federal ESA-Listed and Proposed Species</u> <b>LSI</b> Impacts would be similar to Alternative A, except reduced since housing would be developed further from the coast where special-status species would not be expected to be affected by construction activities, only increased recreational use of marine biological resources.</p>	<p><u>Special-Status Species – Federal ESA-Listed and Proposed Species</u> <b>LSI</b> Impacts would be similar to Alternative A, except slightly reduced since the Finegayan cantonment would be developed further from the coast, thus minimizing impacts.</p>	<p><u>Special-Status Species – Federal ESA-Listed and Proposed Species</u> <b>LSI</b> While less than significant impacts to special-status species would occur for both the No-Action Alternative and the action alternatives discussed in Chapter 4, due to the larger proposed footprint and number of the Marines and dependents that would arrive on Guam under the No-Action Alternative, impacts would be of greater intensity than those for the proposed action in this SEIS.</p>
<p><u>Marine Conservation Areas</u> <b>NI</b> With implementation of access restrictions for construction personnel, use of Haputo ERA is not expected to increase as a result of the construction workforce. Therefore, no direct or indirect impacts to marine conservation areas are expected.</p>	<p><u>Marine Conservation Areas</u> <b>LSI</b> Impacts would be similar to Alternative A, except slightly reduced since housing would be developed further from the coast, thus minimizing impact.</p>	<p><u>Marine Conservation Areas</u> <b>LSI</b> Impacts would be similar to Alternative A, except slightly reduced since housing would be developed further from the coast, thus minimizing impact.</p>	<p><u>Marine Conservation Areas</u> <b>NI</b> There are no anticipated impacts to marine conservation areas as a result of the construction of Alternative D.</p>	<p><u>Marine Conservation Areas</u> <b>LSI</b> Impacts would be similar to Alternative A, except slightly reduced since the Finegayan cantonment would be developed further from the coast, thus minimizing impacts.</p>	<p><u>Marine Conservation Areas</u> <b>LSI</b> While less than significant impacts to Marine Conservation Areas would occur for both the No-Action Alternative and the action alternatives discussed in Chapter 4, due to the larger proposed footprint and number of the Marines and dependents that would arrive on Guam under the No-Action Alternative, impacts would be of greater intensity than those for the proposed action in this SEIS.</p>
<b>Operation Impacts</b>	<b>Operation Impacts</b>	<b>Operation Impacts</b>	<b>Operation Impacts</b>	<b>Operation Impacts</b>	<b>Operation Impacts</b>
<p><u>Marine Flora and Invertebrates</u> <b>SI-M</b> Increasing wastewater discharge from a non-compliant treatment plant could result in significant indirect impacts to marine flora and invertebrates during the period of non-compliance.  <b>Potential Mitigation Measures</b> Upgrading the Northern District WWTP to secondary treatment standards and Guam Water Quality Standards, including those for nutrients (as required by the 2013 NPDES permit), would mitigate significant impacts to marine biological resources. The FY 2014 NDAA requires the EAC to develop an implementation plan that addresses assistance to public infrastructure requirements necessary to support the preferred alternative. The implementation plan will detail descriptions of work, costs, and schedules for completion of construction, improvements, and repairs to Guam public infrastructure affected by the realignment, including improvements and upgrades to the Guam wastewater system. The water and wastewater assessment that DoD prepared to support the Implementation Plan recommends upgrades to the Northern District WWTP and the refurbishment of the GWA interceptor sewer from AAFB to the Northern District WWTP. Section 8102 of the FY 2014 Consolidated Appropriations Act (Public</p>	<p><u>Marine Flora and Invertebrates</u> <b>SI-M</b> Impacts would be similar to Alternative A.  <b>Potential Mitigation Measures</b> Mitigation would be the same as under Alternative A.</p>	<p><u>Marine Flora and Invertebrates</u> <b>SI-M</b> Impacts would be similar to Alternative A.  <b>Potential Mitigation Measures</b> Mitigation would be the same as under Alternative A.</p>	<p><u>Marine Flora and Invertebrates</u> <b>SI-M</b> Impacts would be similar to Alternative A.  <b>Potential Mitigation Measures</b> Mitigation would be the same as under Alternative A but would include recommended upgrades of both the Agaña WWTP and Northern District WWTPs.</p>	<p><u>Marine Flora and Invertebrates</u> <b>SI-M</b> Impacts would be similar to Alternative A.  <b>Potential Mitigation Measures</b> Mitigation would be the same as under Alternative A.</p>	<p><u>Marine Flora and Invertebrates</u> <b>SI-M</b> Impacts would be similar to Alternative A.  <b>Potential Mitigation Measures</b> Mitigation would be the same as Alternative A.</p>

Legend: **SI** = significant impact; **SI-M** = significant impact-mitigable; **LSI** = less than significant impact; **NI** = no impact; **BI** = beneficial impact.

**Table 4.7-1. Summary of Impacts and Potential Mitigation Measures for the Cantonment/Family Housing Alternatives**

<i>Finegayan (Alternative A)</i>	<i>Finegayan/South Finegayan (Alternative B)</i>	<i>Andersen Air Force Base (Alternative C)</i>	<i>Barrigada (Alternative D)</i>	<i>Finegayan/Andersen Air Force Base (Alternative E)</i>	<i>No-Action Alternative</i>
<p><b>Law No. 113-76) appropriated \$106.4 million to the Secretary of Defense, acting through the OEA, for civilian water and wastewater improvements on Guam. These funds will remain available until expended.</b></p> <p><b>LSI</b> Potential indirect impacts to marine flora and invertebrates may occur from increased recreational use, as described above for construction impacts, but are avoided or minimized to less than significant impacts with the implementation of BMPs.</p> <p><b>NI</b> No impact from stormwater, sedimentation, or non-point source pollution.</p>	<p><b>LSI</b> Impacts would be similar to Alternative A, except slightly reduced since housing would be developed further from the coast, thus minimizing impact.</p>	<p><b>LSI</b> Impacts would be similar to Alternative A.</p>	<p><b>LSI</b> Impacts would be similar to Alternative A; however, potential increased recreational use of marine biological resources would likely be lower in intensity but more widespread given this alternative's location is further from the coast.</p>	<p><b>LSI</b> Impacts would be similar to Alternative A, except slightly reduced since the Finegayan cantonment would be developed further from the coast, thus minimizing impacts.</p>	<p><b>LSI</b> While less than significant impacts to marine flora and invertebrates would occur for both the No-Action Alternative and the action alternatives discussed in Chapter 4, due to the larger proposed footprint and number of the Marines and dependents that would arrive on Guam under the No-Action Alternative, impacts would be of greater intensity than those for the proposed action in this SEIS.</p>
<p><b>Fish</b> <b>SI-M</b> Increasing wastewater discharge from a non-compliant treatment plant could result in significant indirect impacts to fish during the period of non-compliance.</p> <p><b>Potential Mitigation Measures</b> Upgrading the Northern District WWTP to secondary treatment standards (as required by the 2013 NPDES permit) would mitigate significant impacts to marine biological resources. The FY 2014 NDAA requires the EAC to develop an implementation plan that addresses assistance to public infrastructure requirements necessary to support the preferred alternative. The implementation plan will detail descriptions of work, costs, and schedules for completion of construction, improvements, and repairs to Guam public infrastructure affected by the realignment, including improvements and upgrades to the Guam wastewater system. The water and wastewater assessment that DoD prepared to support the Implementation Plan recommends upgrades to the Northern District WWTP and the refurbishment of the GWA interceptor sewer from AAFB to the Northern District WWTP. Section 8102 of the FY 2014 Consolidated Appropriations Act (Public Law No. 113-76) appropriated \$106.4 million to the Secretary of Defense, acting through the OEA, for civilian water and wastewater improvements on Guam. These funds will remain available until expended.</p>	<p><b>Fish</b> <b>SI-M</b> Impacts would be similar to Alternative A.</p> <p><b>Potential Mitigation Measures</b> Mitigation would be the same as under Alternative A.</p>	<p><b>Fish</b> <b>SI-M</b> Impacts would be similar to Alternative A.</p> <p><b>Potential Mitigation Measures</b> Mitigation would be the same as under Alternative A.</p>	<p><b>Fish</b> <b>SI-M</b> Impacts would be similar to Alternative A.</p> <p><b>Potential Mitigation Measures</b> Mitigation would be the same as under Alternative A but would include recommended upgrades of both the Agaña WWTP and Northern District WWTPs.</p>	<p><b>Fish</b> <b>SI-M</b> Impacts would be similar to Alternative A.</p> <p><b>Potential Mitigation Measures</b> Mitigation would be the same as under Alternative A.</p>	<p><b>Fish</b> <b>SI-M</b> Impacts would be similar to Alternative A.</p> <p><b>Potential Mitigation Measures</b> Mitigation would be the same as Alternative A.</p>

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**Table 4.7-1. Summary of Impacts and Potential Mitigation Measures for the Cantonment/Family Housing Alternatives**

<i>Finegayan (Alternative A)</i>	<i>Finegayan/South Finegayan (Alternative B)</i>	<i>Andersen Air Force Base (Alternative C)</i>	<i>Barrigada (Alternative D)</i>	<i>Finegayan/Andersen Air Force Base (Alternative E)</i>	<i>No-Action Alternative</i>
<p><b>LSI</b> Potential indirect impacts to fish may occur from increased recreational use as mentioned above, but are avoided or minimized to less than significant impacts with the implementation of BMPs.</p> <p><b>NI</b> No impact from stormwater, sedimentation, or non-point source pollution.</p>	<p><b>LSI</b> Impacts would be similar to Alternative A, except slightly reduced since housing would be developed further from the coast, thus minimizing impacts.</p>	<p><b>LSI</b> Impacts would be similar to Alternative A. In addition, AAFB fishing and swimming regulations would minimize impacts.</p>	<p><b>LSI</b> Impacts would be similar to Alternative A, except lower in intensity but more widespread given this alternative's location is further from the coast.</p>	<p><b>LSI</b> Impacts would be similar to Alternative A, except slightly reduced since the Finegayan cantonment would be developed further from the coast, thus minimizing impacts.</p>	<p><b>LSI</b> While less than significant impacts to fish would occur for both the No-Action Alternative and the action alternatives discussed in Chapter 4, due to the larger proposed footprint and number of Marines and dependents that would arrive on Guam under the No-Action Alternative, impacts would be of greater intensity than those for the proposed action in this SEIS.</p>
<p><b>Essential Fish Habitat</b> <b>SI-M</b> Increasing wastewater discharge from a non-compliant treatment plant could result in significant indirect impacts to essential fish habitat during the period of non-compliance.</p> <p><b>Potential Mitigation Measures</b> Upgrading the Northern District WWTP to secondary treatment standards (as required by the 2013 NPDES permit) would mitigate significant impacts to marine biological resources. The FY 2014 NDAA requires the EAC to develop an implementation plan that addresses assistance to public infrastructure requirements necessary to support the preferred alternative. The implementation plan will detail descriptions of work, costs, and schedules for completion of construction, improvements, and repairs to Guam public infrastructure affected by the realignment, including improvements and upgrades to the Guam wastewater system. The water and wastewater assessment that DoD prepared to support the Implementation Plan recommends upgrades to the Northern District WWTP and the refurbishment of the GWA interceptor sewer from AAFB to the Northern District WWTP. Section 8102 of the FY 2014 Consolidated Appropriations Act (Public Law No. 113-76) appropriated \$106.4 million to the Secretary of Defense, acting through the OEA, for civilian water and wastewater improvements on Guam. These funds will remain available until expended.</p>	<p><b>Essential Fish Habitat</b> <b>SI-M</b> Impacts would be similar to Alternative A.</p> <p><b>Potential Mitigation Measures</b> Mitigation would be the same as under Alternative A.</p>	<p><b>Essential Fish Habitat</b> <b>SI-M</b> Impacts would be similar to Alternative A.</p> <p><b>Potential Mitigation Measures</b> Mitigation would be the same as under Alternative A.</p>	<p><b>Essential Fish Habitat</b> <b>SI-M</b> Impacts would be similar to Alternative A.</p> <p><b>Potential Mitigation Measures</b> Mitigation would be the same as under Alternative A but would include recommended upgrades of both the Agaña WWTP and Northern District WWTPs.</p>	<p><b>Essential Fish Habitat</b> <b>SI-M</b> Impacts would be similar to Alternative A.</p> <p><b>Potential Mitigation Measures</b> Mitigation would be the same as under Alternative A.</p>	<p><b>Essential Fish Habitat</b> <b>SI-M</b> Impacts would be similar to Alternative A.</p> <p><b>Potential Mitigation Measures</b> Mitigation would be the same as Alternative A.</p>

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**Table 4.7-1. Summary of Impacts and Potential Mitigation Measures for the Cantonment/Family Housing Alternatives**

<i>Finegayan (Alternative A)</i>	<i>Finegayan/South Finegayan (Alternative B)</i>	<i>Andersen Air Force Base (Alternative C)</i>	<i>Barrigada (Alternative D)</i>	<i>Finegayan/Andersen Air Force Base (Alternative E)</i>	<i>No-Action Alternative</i>
<p><b>LSI</b> During the interim period of change when the effluent discharged from the Northern District WWTP would not meet Guam Water Quality Standards, the proposed action may adversely affect EFH, but effects would be temporary and less than significant.</p> <p>Potential indirect impacts to EFH may occur from increased recreational use, as described above for construction impacts, but would be avoided or minimized to less than significant impacts with the implementation of BMPs.</p> <p><b>NI</b> No impact from stormwater, sedimentation, or non-point source pollution.</p>	<p><b>LSI</b> Impacts would be similar to Alternative A, except slightly reduced since housing would be developed further from the coast, thus minimizing impact.</p>	<p><b>LSI</b> Impacts would be similar to Alternative A.</p>	<p><b>LSI</b> Impacts would be similar to Alternative A, except lower in intensity but more widespread given this alternative's location is further from the coast</p>	<p><b>LSI</b> Impacts would be similar to Alternative A, except slightly reduced since the Finegayan cantonment would be developed further from the coast, thus minimizing impacts.</p>	<p><b>LSI</b> While less than significant impacts to EFH would occur for both the No-Action Alternative and the action alternatives discussed in Chapter 4, due to the larger proposed footprint and number of the Marines and dependents that would arrive on Guam under the No-Action Alternative, impacts would be of greater intensity than those for the proposed action in this SEIS.</p>
<p><u>Special-Status Species – Federal ESA-Listed and Proposed Species</u></p> <p><b>LSI</b> Potential indirect impacts to the green sea turtle and hawksbill sea turtle may occur from increased recreational use, as described above for construction impacts, but are avoided or minimized to less than significant impacts with the implementation of BMPs.</p> <p><b>NI</b> No impact from stormwater, sedimentation, or non-point source pollution.</p>	<p><u>Special-Status Species – Federal ESA-Listed and Proposed Species</u></p> <p><b>LSI</b> Impacts would be similar to Alternative A, except slightly reduced since housing would be developed further from the coast, thus minimizing impacts.</p>	<p><u>Special-Status Species – Federal ESA-Listed and Proposed Species</u></p> <p><b>LSI</b> Impacts would be similar to Alternative A, except slightly reduced since housing would be developed further from the coast, thus minimizing impacts.</p>	<p><u>Special-Status Species – Federal ESA-Listed and Proposed Species</u></p> <p><b>LSI</b> Impacts would be similar to Alternative A, except slightly reduced since housing would be developed further from the coast, thus minimizing impacts.</p>	<p><u>Special-Status Species – Federal ESA-Listed and Proposed Species</u></p> <p><b>LSI</b> Impacts would be similar to Alternative A, except slightly reduced since housing would be developed further from the coast, thus minimizing impacts.</p>	<p><u>Special-Status Species – Federal ESA-Listed and Proposed Species</u></p> <p><b>LSI</b> While less than significant impacts to special-status species would occur for both the No-Action Alternative and the action alternatives discussed in Chapter 4, due to the larger proposed footprint and number of the Marines and dependents that would arrive on Guam under the No-Action Alternative, impacts would be of greater intensity than those for the proposed action in this SEIS.</p>
<p><u>Marine Conservation Areas</u></p> <p><b>LSI</b> With the implementation of BMPs, direct and indirect impacts associated with operational activities for the proposed action are expected to result in less than significant direct and indirect impacts to conservation efforts and management activities at the Haputo ERA, AAFB Marine Resource Preserve, the Pati Point Marine Preserve, and the submerged lands bordering the Guam NWR at Ritidian Point.</p>	<p><u>Marine Conservation Areas</u></p> <p><b>LSI</b> Impacts would be similar to Alternative A, except slightly reduced since housing would be developed further from the coast, thus minimizing impacts.</p>	<p><u>Marine Conservation Areas</u></p> <p><b>LSI</b> Impacts would be similar to Alternative A, except slightly reduced since housing would be developed further from the coast, thus minimizing impacts.</p>	<p><u>Marine Conservation Areas</u></p> <p><b>NI</b> Impacts would be similar to Alternative A, except slightly reduced since housing would be developed further from the coast, thus minimizing impacts.</p>	<p><u>Marine Conservation Areas</u></p> <p><b>LSI</b> Impacts would be similar to Alternative A, except slightly reduced since housing would be developed further from the coast, thus minimizing impacts.</p>	<p><u>Marine Conservation Areas</u></p> <p><b>LSI</b> While less than significant impacts to Marine Conservation Areas would occur for both the No-Action Alternative and the action alternatives discussed in Chapter 4, due to the larger proposed footprint and number of the Marines and dependents that would arrive on Guam under the No-Action Alternative, impacts would be of greater intensity than those for the proposed action in this SEIS.</p>

Legend: **SI** = significant impact; **SI-M** = significant impact-mitigable; **LSI** = less than significant impact; **NI** = no impact; **BI** = beneficial impact.

**Table 4.7-1. Summary of Impacts and Potential Mitigation Measures for the Cantonment/Family Housing Alternatives**

<i>Finegayan (Alternative A)</i>	<i>Finegayan/South Finegayan (Alternative B)</i>	<i>Andersen Air Force Base (Alternative C)</i>	<i>Barrigada (Alternative D)</i>	<i>Finegayan/Andersen Air Force Base (Alternative E)</i>	<i>No-Action Alternative</i>
<b>CULTURAL RESOURCES</b>					
<b>Construction Impacts</b>	<b>Construction Impacts</b>	<b>Construction Impacts</b>	<b>Construction Impacts</b>	<b>Construction Impacts</b>	<b>Construction Impacts</b>
<p><i>SI-M</i> Potential direct adverse effects to 21 historic properties, including 11 historic properties within the cantonment and housing area and undetermined effects to 7 unevaluated buildings. Potential impacts to culturally important natural resources from vegetation removal.</p> <p><b>Potential Mitigation Measures</b> Proposed mitigation through 2011 PA processes, including data recovery and contractor measures, and coordination with SHPO, concurring parties, and knowledgeable traditional practitioners.</p>	<p><i>SI-M</i> Potential direct adverse effects to 18 historic properties including 8 historic properties within the cantonment and housing area. and undetermined effects to 7 unevaluated buildings. Potential impacts to culturally important natural resources from vegetation removal.</p> <p><b>Potential Mitigation Measures</b> Proposed mitigation through 2011 PA processes, including data recovery and contractor measures, and coordination with SHPO, concurring parties, and knowledgeable traditional practitioners.</p>	<p><i>SI-M</i> Potential direct adverse effects to 17 historic properties including 7 historic properties within the cantonment and housing area and undetermined effects to 12 unevaluated buildings. Potential impacts to culturally important natural resources from vegetation removal.</p> <p><b>Potential Mitigation Measures</b> Proposed mitigation through 2011 PA processes, including data recovery and contractor measures, and coordination with SHPO, concurring parties, and knowledgeable traditional practitioners.</p>	<p><i>SI-M</i> Potential direct adverse effects to 10 historic properties (none within the cantonment and housing area) and undetermined effects to 13 unevaluated archaeological locations and 8 unevaluated buildings. Potential impacts to culturally important natural resources from vegetation removal.</p> <p><b>Potential Mitigation Measures</b> Proposed mitigation through 2011 PA processes, including data recovery and contractor measures, and coordination with SHPO, concurring parties, and knowledgeable traditional practitioners.</p>	<p><i>SI-M</i> Potential direct adverse effects to 17 historic properties, including 7 historic properties within the cantonment and housing areas. Undetermined effects to 14 unevaluated buildings. Potential impacts to culturally important natural resources from vegetation removal.</p> <p><b>Potential Mitigation Measures</b> Proposed mitigation through 2011 PA processes, including data recovery and contractor measures, and coordination with SHPO, concurring parties, and knowledgeable traditional practitioners.</p>	<p><i>SI-M</i> Direct adverse effects to 12 historic properties within the cantonment and housing areas. The total number of historic properties affected does not include off-site utilities such as the well development area. Potential impacts to culturally important natural resources from vegetation removal.</p> <p><b>Potential Mitigation Measures</b> Mitigation through the 2011 PA with data recovery and public interpretation, and coordination with SHPO, concurring parties, and knowledgeable traditional practitioners.</p>
<b>Operation Impacts</b>	<b>Operation Impacts</b>	<b>Operation Impacts</b>	<b>Operation Impacts</b>	<b>Operation Impacts</b>	<b>Operation Impacts</b>
<p><i>SI-M</i> Potential indirect adverse effects to one NRHP-eligible archaeological site/potential traditional cultural property due to increased recreation use.</p> <p><b>Potential Mitigation Measures</b> Proposed mitigation through the 2011 PA stipulation on Cultural Resources Awareness orientation.</p>	<p><i>SI-M</i> Potential indirect adverse effects to two NRHP-eligible archaeological sites/potential traditional cultural properties due to increase in recreation use.</p> <p><b>Potential Mitigation Measures</b> Proposed mitigation through the 2011 PA stipulation on Cultural Resources Awareness orientation and educational signage.</p>	<p><i>NI</i> No effects to historic properties from operations.</p>	<p><i>NI</i> No effects to historic properties from operations.</p>	<p><i>NI</i> No effects to historic properties from operations.</p>	<p><i>SI-M</i> Potential indirect adverse effects to two NRHP-eligible archaeological sites/potential Traditional Cultural Properties due to increased recreation use.</p> <p><b>Potential Mitigation Measures</b> Proposed mitigation through the 2011 PA stipulation on Cultural Resources Awareness orientation.</p>
<b>VISUAL RESOURCES</b>					
<b>Construction Impacts</b>	<b>Construction Impacts</b>	<b>Construction Impacts</b>	<b>Construction Impacts</b>	<b>Construction Impacts</b>	<b>Construction Impacts</b>
<p><i>LSI</i> Short-term direct impacts from presence of construction equipment.</p>	<p><i>LSI</i> Impacts would be similar to Alternative A.</p>	<p><i>LSI</i> Impacts would be similar to Alternative A.</p>	<p><i>LSI</i> Impacts would be similar to Alternative A.</p>	<p><i>LSI</i> Impacts would be similar to Alternative A.</p>	<p><i>LSI</i> Impacts would be similar to Alternative A.</p>
<b>Operation Impacts</b>	<b>Operation Impacts</b>	<b>Operation Impacts</b>	<b>Operation Impacts</b>	<b>Operation Impacts</b>	<b>Operation Impacts</b>
<p><i>LSI</i> The Finegayan site is already partially developed and the reduced number of Marines and dependents coming to Guam would result in less development than that proposed in the 2010 Final EIS. Long-term direct impacts from features being publicly visible from roadways, however, no recognized view corridors or sensitive receptors would be impacted.</p>	<p><i>LSI</i> Long-term, direct impacts from some features being visible to public (e.g., gates, fencing, landscaping). New base features would be consistent with 2011 IAP.</p>	<p><i>LSI</i> The proposed development at AAFB differs substantially from that proposed and approved under the 2010 Final EIS. Long-term direct impact from more urban development related to the cantonment/family housing. Impacts would be less than significant due to the dominant presence of vegetation throughout the region.</p>	<p><i>LSI</i> Direct impacts to the visual element in the long-term, but less than significant, since the visual character of the base would not be drastically altered. Usual characteristics would be altered to a more urban appearance.</p>	<p><i>LSI</i> Impacts would be similar to Alternatives A and C.</p>	<p><i>SI-M</i> The mostly vegetated former FAA parcel and relatively open characteristic of the southern half of Finegayan and South Finegayan would be completely developed. This would represent a major change over the existing visual conditions. However, most of the property is already under DoD ownership, and there are few, if any, sensitive views or receptors that currently exist.</p> <p><b>Potential Mitigation Measures</b> Prepare Installation Appearance Plan and implement design guidelines for all buildings. Minimize impact by using native flora to create a natural-appearing “screen” around the cleared range areas, outside of the firebreaks/perimeter roads. Develop and implement a landscape plan focused on retention of mature specimen trees during construction (where possible)</p>

Legend: *SI* = significant impact; *SI-M* = significant impact-mitigable; *LSI* = less than significant impact; *NI* = no impact; *BI* = beneficial impact.

**Table 4.7-1. Summary of Impacts and Potential Mitigation Measures for the Cantonment/Family Housing Alternatives**

<i>Finegayan (Alternative A)</i>	<i>Finegayan/South Finegayan (Alternative B)</i>	<i>Andersen Air Force Base (Alternative C)</i>	<i>Barrigada (Alternative D)</i>	<i>Finegayan/Andersen Air Force Base (Alternative E)</i>	<i>No-Action Alternative</i>
					and the establishment of a full suite of vegetation representing Guam's native flora.
<b>GROUND TRANSPORTATION</b>					
<b>Construction Impacts</b>	<b>Construction Impacts</b>	<b>Construction Impacts</b>	<b>Construction Impacts</b>	<b>Construction Impacts</b>	<b>Construction Impacts</b>
<i>LSI</i> Short-term, direct impacts from construction workers and construction-related vehicle trips resulting in congestion on on-base roadways. Implementation of appropriate work zone traffic management strategies and BMPs would minimize impacts.	<i>LSI</i> Impacts would be similar to Alternative A. Under this alternative, there would be two separate contiguous development areas unlike Alternative A.	<i>LSI</i> Impacts would be similar to Alternative A. Under this alternative, there would be two separate contiguous development areas unlike Alternative A.	<i>LSI</i> Impacts would be similar to Alternative A.	<i>LSI</i> Impacts would be similar to Alternative A. Under this alternative, there would be two separate contiguous development areas unlike Alternative A.	<i>LSI</i> Impacts would be similar to Alternative A.
<b>Operation Impacts</b>	<b>Operation Impacts</b>	<b>Operation Impacts</b>	<b>Operation Impacts</b>	<b>Operation Impacts</b>	<b>Operation Impacts</b>
<i>NI</i> There would be no long-term direct impacts to on-base (internal) roadways or intersections, transit conditions, pedestrian and bicycle conditions, All on-base (internal) roadway segments and intersections have been designed with the capacity required to accommodate the expected travel demand.	<i>NI</i> Impacts would be similar to Alternative A.	<i>NI</i> Impacts would be similar to Alternative A.	<i>NI</i> Impacts would be similar to Alternative A.	<i>NI</i> Impacts would be similar to Alternative A.	<i>LSI</i> The impacts to ground transportation remain the same as those described in the 2010 Final EIS (Volume 6, Chapter 4: Roadways, Section 2.5.3.2: Alternative 2, page 2-151). Identified impacts would be less than significant through implementation of potential mitigation measures, specifically, the roadway improvements identified in the 2010 Final EIS (Volume 6, Chapter 4: Roadways, Section 2.5.1.7: Table 2.5-3. Guam Road Network Projects by Island Region, pages 2-140 through 2-144).
<b>MARINE TRANSPORTATION</b>					
<b>Construction Impacts</b>	<b>Construction Impacts</b>	<b>Construction Impacts</b>	<b>Construction Impacts</b>	<b>Construction Impacts</b>	<b>Construction Impacts</b>
<i>LSI</i> Construction would result in an increase in vessel traffic that would cause a less than significant short-term, direct impact to port traffic and processing times.	<i>LSI</i> Impacts would be similar to Alternative A.	<i>LSI</i> Impacts would be similar to Alternative A.	<i>LSI</i> Impacts would be similar to Alternative A.	<i>LSI</i> Impacts would be similar to Alternative A.	<i>LSI</i> Impacts would be similar to Alternative A.
<b>Operation Impacts</b>	<b>Operation Impacts</b>	<b>Operation Impacts</b>	<b>Operation Impacts</b>	<b>Operation Impacts</b>	<b>Operation Impacts</b>
<i>LSI</i> Operation would result in an increase in vessel traffic that would cause a less than significant long-term, direct impact to port traffic and processing times.	<i>LSI</i> Impacts would be similar to Alternative A.	<i>LSI</i> Impacts would be similar to Alternative A.	<i>LSI</i> Impacts would be similar to Alternative A.	<i>LSI</i> Impacts would be similar to Alternative A.	<i>LSI</i> Impacts would be similar to Alternative A.
<b>UTILITIES</b>					
<b>Construction Impacts</b>	<b>Construction Impacts</b>	<b>Construction Impacts</b>	<b>Construction Impacts</b>	<b>Construction Impacts</b>	<b>Construction Impacts</b>
<u>Electrical Power</u> <i>LSI</i> Potentially short-term power outages during construction of the expanded system could occur. Advance notice and other measures would minimize impacts.	<u>Electrical Power</u> <i>LSI</i> Impacts would be similar to Alternative A, except for the addition of an underground distribution cable from Finegayan to South Finegayan along Route 3 to provide power to the South Finegayan family housing area.	<u>Electrical Power</u> <i>LSI</i> Impacts would be similar to Alternative A. There could be short-term power outages during construction of the expanded system. Advance notice and other measures would minimize impacts.	<u>Electrical Power</u> <i>LSI</i> Impacts would be similar to Alternative A. There could be short-term power outages during construction of the expanded system. Advance notice and other measures would minimize impacts.	<u>Electrical Power</u> <i>LSI</i> Impacts would be similar to Alternative A. There could be short-term power outages during construction of the expanded system. Advance notice and other measures would minimize impacts.	<u>Electrical Power</u> <i>LSI</i> Reconditioning of existing combustion turbine generators would be required to support the construction phase and operations phase. Upgrades to off-base electrical transmission systems would also be required to support the No-Action Alternative, while no upgrades to existing generating facilities would be required under the proposed action alternatives where the total estimated increase in electrical demand would be about one-third that under the No-Action Alternative.

Legend: *SI* = significant impact; *SI-M* = significant impact-mitigable; *LSI* = less than significant impact; *NI* = no impact; *BI* = beneficial impact.

**Table 4.7-1. Summary of Impacts and Potential Mitigation Measures for the Cantonment/Family Housing Alternatives**

<i>Finegayan (Alternative A)</i>	<i>Finegayan/South Finegayan (Alternative B)</i>	<i>Andersen Air Force Base (Alternative C)</i>	<i>Barrigada (Alternative D)</i>	<i>Finegayan/Andersen Air Force Base (Alternative E)</i>	<i>No-Action Alternative</i>
<p><u>Potable Water</u> <b>LSI</b> Short-term impacts to DoD potable water system during water main replacement and/or system modifications. The replacement main would be installed adjacent to the existing mains and switched over in phases to minimize water service interruptions to current customers and existing storage tanks around Guam should be adequate to provide sufficient water to current customers during modifications. The proposed system would supplement any lost water production.</p>	<p><u>Potable Water</u> <b>LSI</b> Impacts would be similar to Alternative A. Potentially short water outages during construction of the expanded and modified system could occur. Construction phasing, temporary water lines, customer notifications, off-hours construction work, or other potential mitigations would be utilized to mitigate outages.</p>	<p><u>Potable Water</u> <b>LSI</b> Impacts would be similar to Alternative A. Potentially short water outages during construction of the expanded and modified system could occur. Construction phasing, temporary water lines, customer notifications, off-hours construction work, or other potential mitigations would be utilized to mitigate outages.</p>	<p><u>Potable Water</u> <b>LSI</b> Impacts would be similar to Alternative A. Potentially short water outages during construction of the expanded and modified system could occur. Construction phasing, temporary water lines, customer notifications, off-hours construction work, or other potential mitigations would be utilized to mitigate outages.</p>	<p><u>Potable Water</u> <b>LSI</b> Impacts would be similar to Alternative A. Potentially short water outages during construction of the expanded and modified system could occur. Construction phasing, temporary water lines, customer notifications, off-hours construction work, or other potential mitigations would be utilized to mitigate outages.</p>	<p><u>Potable Water</u> <b>SI - GWA Distribution</b> The GWA distribution system is plagued by high, unaccounted-for water, low pressure areas, leaks, and frequent outages and boil water notices. The construction force and induced population influx will put greater strain on this system's ability to deliver water to its customers.</p> <p><b>SI-M - GWA Supply and Transmission</b> Impact to existing overburdened utilities infrastructure on Guam would be exacerbated by workforce and induced population. Projected potable water demand would not exceed sustainable yield of the NGLA.</p> <p><b>Potential Mitigation Measures</b> <b>Mitigation would be the same as defined in the 2010 ROD.</b></p> <p><b>LSI - NGLA</b> The sustainable yield of the NGLA is adequate to provide required water during the construction period should adequate number of properly spaced wells be provided.</p>
<p><u>Wastewater</u> <b>SI</b> Construction of the cantonment/family housing facilities under Alternative A would result in significant and unmitigable direct impacts during the period of non-compliance with the 2013 NPDES permit at the Northern District WWTP.</p> <p><b>Potential Mitigation Measures</b> <b>Potential mitigation measures during construction would include constructing sewers during low flow periods, by-pass pumping, and having pump trucks on stand-by.</b></p> <p><b>LSI</b> Short-term, direct impact from potential service outages to current customers and sewage spills. Impacts minimized with BMPs.</p>	<p><u>Wastewater</u> <b>SI</b> Impacts would be similar to Alternative A.</p> <p><b>Potential Mitigation Measures</b> <b>Mitigation would be the same as under Alternative A.</b></p> <p><b>LSI</b> Short-term, direct impact from potential service outages to current customers and sewage spills. Impacts minimized with BMPs.</p>	<p><u>Wastewater</u> <b>SI</b> Impacts would be similar to Alternative A.</p> <p><b>Potential Mitigation Measures</b> <b>Mitigation would be the same as under Alternative A.</b></p> <p><b>LSI</b> Short-term, direct impact from potential service outages to current customers and sewage spills. Impacts minimized with BMPs.</p>	<p><u>Wastewater</u> <b>SI</b> Impacts would be similar to Alternative A, except that impacts would affect both the Northern District WWTP and Agaña WWTP during the period of non-compliance with the NPDES permit.</p> <p><b>Potential Mitigation Measures</b> <b>Mitigation would be the same as under Alternative A.</b></p> <p><b>LSI</b> Short-term, direct impact from potential service outages to current customers and sewage spills. Impacts minimized with BMPs.</p>	<p><u>Wastewater</u> <b>SI</b> Impacts would be similar to Alternative A.</p> <p><b>Potential Mitigation Measures</b> <b>Mitigation would be the same as under Alternative A.</b></p> <p><b>LSI</b> Short-term, direct impact from potential service outages to current customers and sewage spills. Impacts minimized with BMPs.</p>	<p><u>Wastewater</u> <b>SI</b> Impacts would be similar to the action alternatives long-term direct impact because the Northern District WWTP currently would not be able to meet current treatment discharge limits.</p> <p><b>Potential Mitigation Measures</b> <b>Mitigation would be the same as defined in the 2010 ROD.</b></p> <p><b>LSI</b> Wastewater (direct) DoD Apra Harbor WWTP treatment capacity. Wastewater (indirect) GWA Agaña WWTP treatment capacity. Wastewater (indirect) GWA Agaña WWTP effluent quality. Wastewater (indirect) GWA southern Guam WWTPs.</p>

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**Table 4.7-1. Summary of Impacts and Potential Mitigation Measures for the Cantonment/Family Housing Alternatives**

<b><i>Finegayan (Alternative A)</i></b>	<b><i>Finegayan/South Finegayan (Alternative B)</i></b>	<b><i>Andersen Air Force Base (Alternative C)</i></b>	<b><i>Barrigada (Alternative D)</i></b>	<b><i>Finegayan/Andersen Air Force Base (Alternative E)</i></b>	<b><i>No-Action Alternative</i></b>
<p><u>Solid Waste</u> <b>LSI</b> The new Layon Landfill has the capacity to accommodate the projected MSW for the reduced levels of the current proposed action. The C&amp;D debris that cannot be recycled or reused, and wastes that are prohibited at Layon Landfill would be disposed at the Naval Base Guam Landfill and permitted private hardfill facilities. All green waste would be processed for reuse. The DON is currently coordinating with the GEPA regarding the status of the permit for the Naval Base Guam Landfill. The proposed action would be consistent with solid waste permit terms and conditions.</p>	<p><u>Solid Waste</u> <b>LSI</b> Impacts would be similar to Alternative A.</p>	<p><u>Solid Waste</u> <b>LSI</b> Impacts would be similar to Alternative A, except that Alternative C would generate greater quantities of C&amp;D waste due to the increased demolition of existing housing units at AAFB and the increased number of new units to be constructed.</p>	<p><u>Solid Waste</u> <b>LSI</b> Impacts would be similar to Alternative A, except that Alternative D would generate greater quantities of C&amp;D debris during construction</p>	<p><u>Solid Waste</u> <b>LSI</b> Impacts would be similar to Alternative A, except that Alternative E would generate greater quantities of C&amp;D waste due to the increased demolition of existing housing units at AAFB and the increased number of new units to be constructed.</p>	<p><u>Solid Waste</u> <b>LSI</b> The quantities of solid wastes generated by the No-Action Alternative would be similar to that described in the 2010 Final EIS (Volume 6, Chapter 3) and would be substantially greater than that of the current proposed action.</p>
<p><u>IT/COMM</u> <b>LSI</b> Short-term interruption to commercial service during rerouting of duct banks during construction. Commercial IT/COMM would need to be expanded into the proposed new development and would add users, presenting a minimal short-term, direct impact to current users.</p>	<p><u>IT/COMM</u> <b>LSI</b> Impacts would be similar to Alternative A.</p>	<p><u>IT/COMM</u> <b>LSI</b> Impacts would be similar to Alternative A. Minimal potential for short- or long-term adverse environmental consequences to the existing DoD IT/COMM facilities at AAFB. Direct impact from short-term lack of commercial service during the construction phase.</p>	<p><u>IT/COMM</u> <b>LSI</b> Impacts would be similar to Alternative A. For the proposed housing area at Barrigada, there are several existing DoD IT/COMM lines, but no commercial lines. The proposed housing area has been designed around those existing lines using the best available information on their locations. It is possible that these lines could be impacted during construction. Should the locations of these existing lines be different from available information, the lines might require relocation or the proposed development might require revisions to avoid the existing lines.</p>	<p><u>IT/COMM</u> <b>LSI</b> Short-term interruption to commercial service during rerouting of duct banks during construction. Commercial IT/COMM would need to be expanded into the proposed new development areas at both Finegayan (main cantonment) and AAFB (housing) and would add users, presenting a minimal short-term, direct impact to current users.</p>	<p><u>IT/COMM</u> <b>LSI</b> Impacts would be similar to Alternative A. IT/COMM would have slightly more on base routings for the No-Action Alternative due to the increased size of the proposed cantonment/family housing.</p>
<p><b>Operation Impacts</b></p> <p><u>Electrical Power</u> <b>LSI</b> No long-term, direct impacts as electrical power distribution system has been developed to handle the increased demand from the proposed action and proposed improvements to electrical transmission systems would accommodate future demand. The island-wide electrical power generating system owned and operated by the GPA has adequate capacity to provide for the additional demands from the proposed action. With the proposed improvements to electrical transmission systems and measures to minimize outages during construction, long- and short-term direct impacts to the electrical systems would be less than significant.</p>	<p><b>Operation Impacts</b></p> <p><u>Electrical Power</u> <b>LSI</b> Impacts would be similar to Alternative A.</p>	<p><b>Operation Impacts</b></p> <p><u>Electrical Power</u> <b>LSI</b> Impacts would be similar to Alternative A.</p>	<p><b>Operation Impacts</b></p> <p><u>Electrical Power</u> <b>LSI</b> Impacts would be similar to Alternative A.</p>	<p><b>Operation Impacts</b></p> <p><u>Electrical Power</u> <b>LSI</b> Impacts would be similar to Alternative A.</p>	<p><b>Operation Impacts</b></p> <p><u>Electrical Power</u> <b>LSI</b> Off-base electrical transmission and generation systems would be upgraded to support the No-Action Alternative.</p>

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**Table 4.7-1. Summary of Impacts and Potential Mitigation Measures for the Cantonment/Family Housing Alternatives**

<i>Finegayan (Alternative A)</i>	<i>Finegayan/South Finegayan (Alternative B)</i>	<i>Andersen Air Force Base (Alternative C)</i>	<i>Barrigada (Alternative D)</i>	<i>Finegayan/Andersen Air Force Base (Alternative E)</i>	<i>No-Action Alternative</i>
<p><u>Potable Water</u> <i>SI-M (local) LSI (overall)</i> <i>NGLA Impact</i> Short-term, localized significant impacts to the affected basin within the NGLA but less than significant impacts to the overall NGLA. Increased withdrawal from the NGLA may result in higher levels of chloride concentrations. The chloride concentration spikes could be a localized phenomenon, based on USGS modeling of NGLA.</p> <p><i>Potential Mitigation Measures</i> The DoD would, as appropriate, implement enhanced water conservation measures for the proposed action, improve existing DoD water systems to reduce system leaks, adjust pumping rates at DoD wells, use existing wells, and/or increase the use of surface water from Fena Reservoir to reduce withdrawals from the NGLA. The DoD would continue to support the GWRDG and would support USGS's recommendation to rehabilitate and expand the hydrologic data collection network and monitoring necessary to ensure sustainable management of NGLA. Expansion/rehabilitation of the NGLA monitoring well network would mitigate significant impacts. The FY 2014 NDAA directed the Secretary of Defense to convene the EAC in part to develop an implementation plan that will address public infrastructure requirements necessary to support the preferred alternative. The implementation plan will detail descriptions of work, costs, and schedules for completion of construction, improvements, and repairs to Guam public infrastructure affected by the realignment, including rehabilitation and expansion of the NGLA monitoring well network. The water and wastewater assessment that DoD prepared to support the Implementation Plan recommended an updated and expanded NGLA monitoring well network. Section 8102 of the FY 2014 Consolidated Appropriations Act (Public Law No. 113-76) appropriated \$106.4 million to the Secretary of Defense, acting through the OEA, for civilian water and wastewater improvements on Guam. These funds will remain available until expended.</p>	<p><u>Potable Water</u> <i>SI-M (local) LSI (overall)</i> <i>NGLA Impact</i> Impacts would be similar to Alternative A.</p> <p><i>Potential Mitigation Measures</i> Mitigation would be the same as under Alternative A.</p>	<p><u>Potable Water</u> <i>SI-M (local) LSI (overall)</i> <i>NGLA Impact</i> Impacts would be similar to Alternative A.</p> <p><i>Potential Mitigation Measures</i> Mitigation would be the same as under Alternative A.</p>	<p><u>Potable Water</u> <i>SI-M (local) LSI (overall)</i> <i>NGLA Impact</i> Impacts would be similar to Alternative A.</p> <p><i>Potential Mitigation Measures</i> Mitigation would be the same as under Alternative A.</p>	<p><u>Potable Water</u> <i>SI-M (local) LSI (overall)</i> <i>NGLA Impact</i> Impacts would be similar to Alternative A.</p> <p><i>Potential Mitigation Measures</i> Mitigation would be the same as under Alternative A.</p>	<p><u>Potable Water</u> <i>SI</i> <i>GWA Water System</i> Significant indirect impact from increased water demand beyond system capacity. GWA has limited resources to provide water system supply improvements needed to meet indirect demand increases.</p> <p><i>Potential Mitigation Measures</i> Mitigation would be the same as defined in the 2010 ROD.</p>

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**Table 4.7-1. Summary of Impacts and Potential Mitigation Measures for the Cantonment/Family Housing Alternatives**

<i>Finegayan (Alternative A)</i>	<i>Finegayan/South Finegayan (Alternative B)</i>	<i>Andersen Air Force Base (Alternative C)</i>	<i>Barrigada (Alternative D)</i>	<i>Finegayan/Andersen Air Force Base (Alternative E)</i>	<i>No-Action Alternative</i>
<p><b>LSI</b> Long-term increased demand to DoD and GWA systems. The DoD would have excess capacity until the Marine Corps fully occupies the proposed installation. Long-term operation of approximately 11 new wells would not impact the NGLA overall and localized short term impacts of SI-M are discussed above. Indirect impacts to GWA water system would occur due to the small increase in demand from the proposed action.</p>	<p><b>LSI</b> Impacts would be similar to Alternative A. The proposed water infrastructure has been designed to meet the needs of the proposed action.</p>	<p><b>LSI</b> Impacts would be similar to Alternative A. The proposed water infrastructure has been designed to meet the needs of the proposed action.</p>	<p><b>LSI</b> The current water system for existing facilities would remain in service but be integrated with the proposed expanded water system for operational efficiency. Similar to Alternative A, the proposed water infrastructure has been designed to meet the needs of the proposed action.</p>	<p><b>LSI</b> Long-term increased demand to DoD and GWA systems. The DoD would have excess capacity until the Marine Corps fully occupies the proposed installation. Long-term operation of approximately 11 new wells would not impact the NGLA overall and localized short term impacts of SI-M are discussed above. Indirect impacts to GWA water system would occur due to the small increase in demand from the proposed action.</p>	<p><b>SI-M (local) LSI (overall)</b> <b>NGLA Impact</b> Localized Impacts to NGLA Recent results from the aquifer study indicate that localized increased salinity could result during drought years from this increased extraction rate, which can be limited by shifting water extraction among available wells. For the overall NGLA, total forecast water extraction demands from the NGLA are within estimated sustainable yields with proper aquifer management. The aquifer study would need to be updated for the higher estimated extraction rate under the no action alternative, which could result in a potentially greater impact to the NGLA.</p> <p><b>Potential Mitigation Measures</b> <b>Mitigation would be the same as defined in the 2010 ROD.</b></p> <p><b>LSI</b> <b>DoD Water System (direct impact)</b> For DoD water systems, direct impact would be LSI since the DoD water systems would be upgraded to serve the increased needs.</p>
<p><b>Wastewater</b> <b>SI-M</b> Operation of the cantonment/family housing facilities under Alternative A would result in significant direct impacts during the period of non-compliance with the 2013 NPDES permit at the Northern District WWTP. However, upgrades to bring the Northern District WWTP into compliance with the permit are expected to be completed early in the operational phase of the proposed action so operation impacts would therefore be significant but mitigable. The existing GWA interceptor sewer system is in a state of deterioration and needs to be refurbished. Increased flow from the proposed action would accelerate this deterioration and could lead to failure of the sewer system. This would represent a significant but mitigable impact.</p> <p><b>Potential Mitigation Measures</b> <b>Improvements and upgrades to the Guam wastewater system would mitigate significant impacts. The FY 2014 NDAA requires the EAC to develop an implementation plan that addresses assistance to public infrastructure requirements necessary to support the preferred alternative. Section 8102 of the FY 2014 Consolidated Appropriations Act (Public Law No. 113-76) appropriated \$106.4 million to the Secretary of Defense, acting through the OEA, for civilian water</b></p>	<p><b>Wastewater</b> <b>SI-M</b> Impacts would be similar to Alternative A.</p> <p><b>Potential Mitigation Measures</b> <b>Mitigation would be the same as under Alternative A.</b></p>	<p><b>Wastewater</b> <b>SI-M</b> Impacts would be similar to Alternative A.</p> <p><b>Potential Mitigation Measures</b> <b>Mitigation would be the same as under Alternative A.</b></p>	<p><b>Wastewater</b> <b>SI-M</b> Impacts would be similar to Alternative A. However, impacts would result from permit noncompliance and increased wastewater flows from both Northern District WWTP and Agaña WWTP.</p> <p><b>Potential Mitigation Measures</b> <b>Mitigation would be the same as under Alternative A but would include recommended upgrades of both the Agaña WWTP and Northern District WWTP.</b></p>	<p><b>Wastewater</b> <b>SI-M</b> Impacts would be similar to Alternative A.</p> <p><b>Potential Mitigation Measures</b> <b>Mitigation would be the same as under Alternative A.</b></p>	<p><b>Wastewater</b> <b>SI-M</b> For the No-Action Alternative, impacts to wastewater would be similar to those described in the 2010 Final EIS (Volume 6, Chapter 3: Utilities, Section 3.2.4: Wastewater, pages 3-69 to 3-81), with the additional significant but mitigable impact to the collection system from AAFB to the Northern District WWTP.</p> <p><b>Potential Mitigation Measures</b> <b>Mitigation would be the same as described in the 2010 ROD with the addition of refurbishment of the existing collection system from AAFB to the Northern District WWTP.</b></p>

Legend: *SI* = significant impact; *SI-M* = significant impact-mitigable; *LSI* = less than significant impact; *NI* = no impact; *BI* = beneficial impact.

**Table 4.7-1. Summary of Impacts and Potential Mitigation Measures for the Cantonment/Family Housing Alternatives**

<i>Finegayan (Alternative A)</i>	<i>Finegayan/South Finegayan (Alternative B)</i>	<i>Andersen Air Force Base (Alternative C)</i>	<i>Barrigada (Alternative D)</i>	<i>Finegayan/Andersen Air Force Base (Alternative E)</i>	<i>No-Action Alternative</i>
<p><b>and wastewater improvements on Guam. These funds will remain available until expended.</b></p> <p><b>LSI</b> Agaña WWTP and GWA southern WWTPs would be indirectly impacted by wastewater flows from the induced civilian growth. The minor additional flows from indirect impacts, the long-term, direct impact to each would be less than significant.</p>	<p><b>LSI</b> Impacts would be similar to Alternative A, there would be less than significant long-term impacts for the collection system and for other wastewater treatment plants and collection systems during operations.</p>	<p><b>LSI</b> Impacts would be similar to Alternative A, there would be less than significant long-term impacts for the collection system and for other wastewater treatment plants and collection systems during operations.</p>	<p><b>LSI</b> Impacts would be similar to Alternative A, there would be less than significant long-term impacts for the collection system and for other wastewater treatment plants and collection systems during operations.</p>	<p><b>LSI</b> Agaña WWTP and GWA southern WWTPs would be indirectly impacted by wastewater flows from the induced civilian growth. The minor additional flows from indirect impacts, the long-term, direct impact to each would be less than significant.</p>	
<p><b>Solid Waste</b></p> <p><b>LSI</b> The new Layon Landfill has the capacity to accommodate the projected MSW from Alternative A. The long-term increase in solid waste generated by the additional DoD population would be managed by the new transfer station, recycling center, and planned additional solid waste handling trucks/equipment. The proposed action would be consistent with solid waste permit terms and conditions.</p>	<p><b>Solid Waste</b></p> <p><b>LSI</b> Impacts would be similar to Alternative A, except there would be a small increase in transport of MSW from family housing at South Finegayan to the transfer facility at Finegayan cantonment.</p>	<p><b>Solid Waste</b></p> <p><b>LSI</b> Impacts would be similar to Alternative A. The existing solid waste resources at AAFB would be able to handle the increased family housing solid waste generation since the number of total housing units is being increased by only approximately 11%. The proposed cantonment at AAFB would have its own new solid waste handling facilities and not impact the existing solid waste facilities at AAFB.</p>	<p><b>Solid Waste</b></p> <p><b>LSI</b> Impacts would be similar to Alternative A.</p>	<p><b>Solid Waste</b></p> <p><b>LSI</b> Impacts would be similar to Alternative A. The existing solid waste resources at AAFB would be able to handle the increased family housing solid waste generation since the number of total housing units is being increased by only approximately 11%. The proposed cantonment at Finegayan would have its own solid waste handling facilities and not impact the existing solid waste facilities at AAFB.</p>	<p><b>Solid Waste</b></p> <p><b>LSI</b> The quantities of solid wastes generated by the No-Action Alternative would be similar to that described in the 2010 Final EIS (Volume 6, Chapter 3) and would be substantially greater than that of the current proposed action. The solid waste disposal capacity on Guam has changed since the 2010 Final EIS due to the opening of the new GovGuam Layon Landfill.</p>
<p><b>IT/COMM</b></p> <p><b>LSI</b> Long-term, direct impacts to current DoD operations would be less than significant by designing the additional expanded system in an integrated way. Current commercial IT/COMM facilities have adequate capacity within nearby infrastructure.</p>	<p><b>IT/COMM</b></p> <p><b>LSI</b> Impacts would be similar to Alternative A. IT/COMM infrastructure has been designed to meet project needs.</p>	<p><b>IT/COMM</b></p> <p><b>LSI</b> Impacts would be similar to Alternative A. There would be minimal potential for short- or long-term adverse environmental consequences to the existing DoD IT/COMM facilities at AAFB. Existing Building 112 at Finegayan has adequate current capacity to handle additional connections for IT/COMM required. The current commercial IT/COMM facilities have adequate capacity within nearby infrastructure. No permanent or long-term environmental consequences to the commercial IT/COMM infrastructure.</p>	<p><b>IT/COMM</b></p> <p><b>LSI</b> Impacts would be similar to Alternative A. The proposed IT/COMM infrastructure has been developed to meet the requirements for the proposed action. However, for the proposed cantonment/housing area at Barrigada, there is no existing IT/COMM infrastructure so there would be no environmental impacts to users of that resource.</p>	<p><b>IT/COMM</b></p> <p><b>LSI</b> Long-term, direct impacts to current DoD operations would be less than significant by designing the additional expanded system in an integrated way. Current commercial IT/COMM facilities have adequate capacity within nearby infrastructure for both Finegayan (main cantonment) and AAFB (housing).</p>	<p><b>IT/COMM</b></p> <p><b>LSI</b> IT/COMM would have slightly more on base routings for the No-Action Alternative due to the increased size of the proposed cantonment/family housing.</p>
<b>SOCIOECONOMICS AND GENERAL SERVICES</b>					
<b>Construction and Operation Impacts</b>	<b>Construction and Operation Impacts</b>	<b>Construction and Operation Impacts</b>	<b>Construction and Operation Impacts</b>	<b>Construction and Operation Impacts</b>	<b>Construction and Operation Impacts</b>
<p><b>Population Change</b></p> <p><b>SI</b> The population change associated with the proposed Marine Corps relocation would be considered significant during both the construction and operations phases (given that population change would exceed 2%). Between the years 2021 and 2023 the population with the proposed action is 5.6% higher than it otherwise would have been without the proposed action. At a steady-state the difference would be 4.1%. However, the significant change would not be considered entirely negative. Impacts related to population change would be mixed, with some adverse and some beneficial outcomes, as noted in the following subsections.</p>	<p><b>Population Change</b></p> <p><b>SI</b> The impacts would be island-wide and would be the same as described under Alternative A.</p> <p><b>Potential Mitigation Measures</b> <b>Mitigation would be the same as under Alternative A.</b></p>	<p><b>Population Change</b></p> <p><b>SI</b> The impacts would be island-wide and would be the same as described under Alternative A.</p> <p><b>Potential Mitigation Measures</b> <b>Mitigation would be the same as under Alternative A.</b></p>	<p><b>Population Change</b></p> <p><b>SI</b> The impacts would be island-wide and would be the same as described under Alternative A.</p> <p><b>Potential Mitigation Measures</b> <b>Mitigation would be the same as under Alternative A.</b></p>	<p><b>Population Change</b></p> <p><b>SI</b> The impacts would be island-wide and would be the same as described under Alternative A.</p> <p><b>Potential Mitigation Measures</b> <b>Mitigation would be the same as under Alternative A.</b></p>	<p><b>Population Change</b></p> <p><b>SI</b> Population increase during construction would be both beneficial and adverse; population growth fuels economic expansion but sudden population growth would strain government services and the social fabric.</p> <p><b>Potential Mitigation Measures</b> <b>See the 2010 Final EIS, Volume 7, Chapter 2: Overview of Best Management Practices and Proposed Mitigation Measures, Table 2.2-1: Summary of Proposed Mitigation Measures (mitigations specific to Volume 2), Pages 2-25-2-45.</b></p>

Legend: **SI** = significant impact; **SI-M** = significant impact-mitigable; **LSI** = less than significant impact; **NI** = no impact; **BI** = beneficial impact.

**Table 4.7-1. Summary of Impacts and Potential Mitigation Measures for the Cantonment/Family Housing Alternatives**

<i>Finegayan (Alternative A)</i>	<i>Finegayan/South Finegayan (Alternative B)</i>	<i>Andersen Air Force Base (Alternative C)</i>	<i>Barrigada (Alternative D)</i>	<i>Finegayan/Andersen Air Force Base (Alternative E)</i>	<i>No-Action Alternative</i>
<b>Potential Mitigation Measures</b> No mitigation is proposed as the population increase would not likely result in a sustained increase in demand on Guam's public services and permitting agencies, and the estimated increases in GovGuam tax revenues would likely compensate for any increased demand on public services that would occur.					
<p><u>Economic Activity</u> <b>LSI</b> There would not be a significant impact related to civilian housing demand because there would not be a substantial change to baseline conditions. Effect on rate payers for utilities would be minimal since the estimated increase in power demand could be handled by existing generating capacity. Impacts to tourism would be considered mixed (partially beneficial and partially adverse) and, overall, less than significant. Compared to the overall number of annual visitor arrivals to Guam, the number of construction-related business visitor arrivals would be expected to be small and thus impacts would be considered less than significant. Impacts to Guam's tourism industry from loss of workforce and/or wage increases would be considered less than significant.</p> <p><b>BI</b> Economic impacts would be beneficial, leading to increased employment and standards of living. In 2021, civilian labor force demand with the proposed action would be 11.9% higher than it otherwise would have been, without the project. At 2028, the difference would decline to 2.4% - both representing a beneficial impact. Civilian labor force income would also be higher than it otherwise would have been, during the construction and operations phases. During the operations phase, it is likely that the increase in military personnel would generate more visits from friends and family, as well as more business travel, beneficially impacting the tourism industry. There would be a beneficial impact from increase in civilian labor force income, increase in GIP, and tax revenues during the construction and operations phases.</p>	<p><u>Economic Activity</u> <b>LSI</b> The impacts would be island-wide and would be the same as described under Alternative A.</p> <p><b>BI</b> The impacts would be island-wide and would be the same as described under Alternative A.</p>	<p><u>Economic Activity</u> <b>LSI</b> The impacts would be island-wide and would be the same as described under Alternative A.</p> <p><b>BI</b> The impacts would be island-wide and would be the same as described under Alternative A.</p>	<p><u>Economic Activity</u> <b>LSI</b> The impacts would be island-wide and would be the same as described under Alternative A.</p> <p><b>BI</b> The impacts would be island-wide and would be the same as described under Alternative A.</p>	<p><u>Economic Activity</u> <b>LSI</b> The impacts would be island-wide and would be the same as described under Alternative A.</p> <p><b>BI</b> The impacts would be island-wide and would be the same as described under Alternative A.</p>	<p><u>Economic Activity</u> <b>SI</b> Substantial stresses related to rapid population influx, potential housing shortage associated with the construction boom.</p> <p><b>Potential Mitigation Measures</b> See the 2010 Final EIS, Volume 7, Chapter 2: Overview of Best Management Practices and Proposed Mitigation Measures, Table 2.2-1: Summary of Proposed Mitigation Measures (mitigations specific to Volume 2), Pages 2-25- 2-45.</p> <p><b>BI</b> Most long-term economic impacts would be beneficial including growth in employment, income, and gross island product.</p>

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**Table 4.7-1. Summary of Impacts and Potential Mitigation Measures for the Cantonment/Family Housing Alternatives**

<i>Finegayan (Alternative A)</i>	<i>Finegayan/South Finegayan (Alternative B)</i>	<i>Andersen Air Force Base (Alternative C)</i>	<i>Barrigada (Alternative D)</i>	<i>Finegayan/Andersen Air Force Base (Alternative E)</i>	<i>No-Action Alternative</i>
<p><u>Public Services</u> <b>SI-M</b> During construction, all categories of public services agencies combined would require an estimated 185 additional employees, an increase of 3.6% over baseline staffing levels. This maximum increase in staffing levels would be temporary, lasting from approximately 2021 through 2023. Staffing requirements for many public service agencies would increase by more than 2%, and given existing deficiencies at many agencies, significant impacts were identified.</p> <p><b>Potential Mitigation Measures</b> The DoD would continue to support the efforts of the CMCC to develop recommendations, as appropriate, regarding adjustment of construction tempo and sequencing to directly influence workforce population levels and indirectly influence induced population growth before infrastructure capabilities are exceeded. Such support may include providing project-related employment and population forecasts, participating in the identification of shortfalls in Guam public services, and assisting in the identification of federal programs and funding sources that may help GovGuam to address shortfalls. The DoD would continue to support existing programs that contribute and/or donate excess equipment to local agencies.</p>	<p><u>Public Services</u> <b>SI-M</b> The impacts would be island-wide and would be the same as described under Alternative A.</p> <p><b>Potential Mitigation Measures</b> Mitigation would be the same as under Alternative A.</p>	<p><u>Public Services</u> <b>SI-M</b> The impacts would be island-wide and would be the same as described under Alternative A.</p> <p><b>Potential Mitigation Measures</b> Mitigation would be the same as under Alternative A.</p>	<p><u>Public Services</u> <b>SI-M</b> The impacts would be island-wide and would be the same as described under Alternative A.</p> <p><b>Potential Mitigation Measures</b> Mitigation would be the same as under Alternative A.</p>	<p><u>Public Services</u> <b>SI-M</b> The impacts would be island-wide and would be the same as described under Alternative A.</p> <p><b>Potential Mitigation Measures</b> Mitigation would be the same as under Alternative A.</p>	<p><u>Public Services</u> <b>SI</b> Significant adverse impacts to public services during construction and at steady state (operations phase) due to increased requirements for staffing and services. Because of the larger scale of the construction activities and the projected direct, indirect, and induced population growth under the No-Action Alternative, the impacts to public services would be more intensive than any of the alternatives evaluated in this SEIS.</p> <p><b>Potential Mitigation Measures</b> See the 2010 Final EIS, Volume 7, Chapter 2: Overview of Best Management Practices and Proposed Mitigation Measures, Table 2.2-1: Summary of Proposed Mitigation Measures (mitigations specific to Volume 2), Pages 2-25-2-45.</p>
<p><b>LSI</b> At steady-state (operations phase), GovGuam public services agencies would require an additional 66 staff, an increase of 1.3% over baseline levels, resulting in a less than significant impact.</p>	<p><b>LSI</b> At steady-state (operations phase), the impacts would be island-wide and would be the same as described under Alternative A.</p>	<p><b>LSI</b> At steady-state (operations phase), the impacts would be island-wide and would be the same as described under Alternative A.</p>	<p><b>LSI</b> At steady-state (operations phase), the impacts would be island-wide and would be the same as described under Alternative A.</p>	<p><b>LSI</b> At steady-state (operations phase), the impacts would be island-wide and would be the same as described under Alternative A.</p>	
<p><u>Sociocultural Issues</u> <b>SI-M</b> There is a potential for sociocultural impact to occur, but the magnitude of the impacts are difficult to predict and could vary substantially based on policy and program choices yet to be made as how to address them. For these reasons, and for the purposes of this SEIS, impacts to sociocultural issues are conservatively classified as significant but mitigable.</p> <p><b>Potential Mitigation Measures</b> In accordance with the 2011 PA, the DoD will conduct orientation briefs for all incoming DoD personnel, their families, and contractors regarding cultural sensitivity in the area. All DoD personnel and contractors working on Guam will receive annual</p>	<p><u>Sociocultural Issues</u> <b>SI-M</b> The impacts would be island-wide and would be the same as described under Alternative A.</p> <p><b>Potential Mitigation Measures</b> Mitigation would be the same as under Alternative A.</p>	<p><u>Sociocultural Issues</u> <b>SI-M</b> The impacts would be island-wide and would be the same as described under Alternative A.</p> <p><b>Potential Mitigation Measures</b> Mitigation would be the same as under Alternative A.</p>	<p><u>Sociocultural Issues</u> <b>SI-M</b> The impacts would be island-wide and would be the same as described under Alternative A.</p> <p><b>Potential Mitigation Measures</b> Mitigation would be the same as under Alternative A.</p>	<p><u>Sociocultural Issues</u> <b>SI-M</b> The impacts would be island-wide and would be the same as described under Alternative A.</p> <p><b>Potential Mitigation Measures</b> Mitigation would be the same as under Alternative A.</p>	<p><u>Sociocultural Issues</u> <b>SI</b> There would be adverse sociocultural impacts.</p> <p><b>Potential Mitigation Measures</b> See the 2010 Final EIS, Volume 7, Chapter 2: Overview of Best Management Practices and Proposed Mitigation Measures, Table 2.2-1: Summary of Proposed Mitigation Measures (mitigations specific to Volume 2), Pages 2-25-2-45.</p>

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<p>briefings. The DoD will develop the briefing in consultation with the appropriate SHPO and will provide SHPO with a copy of the final briefing materials.</p> <p>The DoD would continue to support the efforts of the CMCC to develop recommendations, as appropriate, regarding adjustment of construction tempo and sequencing to directly influence workforce population levels and indirectly influence induced population growth to address sociocultural issues. See Section 2.9 for further discussion on the CMCC.</p> <p>The \$12,000,000 appropriated under the FY 2012 Consolidated Appropriations Act (Public Law 112-74) for a Guam Cultural Repository facility remains in place. The appropriation provides funding for a repository for curation of archaeological collections on Guam and to serve as a source of information on Guam history and culture. As directed by the FY 2014 NDAA, the DoD would convene the EAC to consider necessary technical and financial assistance and develop an implementation plan coordinated with EAC federal agencies. This plan must be submitted to the congressional defense committees as part of a reporting requirement that is due no later than the date of issuance of the ROD.</p>					
<b>HAZARDOUS MATERIALS AND WASTE</b>					
<b>Construction Impacts</b>	<b>Construction Impacts</b>	<b>Construction Impacts</b>	<b>Construction Impacts</b>	<b>Construction Impacts</b>	<b>Construction Impacts</b>
<p><u>Hazardous Materials Management</u> <b>LSI</b> Short-term increased hazardous waste generation, storage, handling, and disposal would have short-term direct impacts to human health and the environment. Direct impacts to two existing Installation Restoration Program sites. Indirect, long-term beneficial impact to fuel storage and conveyance infrastructure from being brought into compliance.</p>	<p><u>Hazardous Materials Management</u> <b>LSI</b> Impacts would be similar to Alternative A, with the exception that there would be potential direct impacts to one existing Installation Restoration Program site.</p>	<p><u>Hazardous Materials Management</u> <b>LSI</b> Impacts would be similar to Alternative A, with the exception that there would be potential direct impacts to six existing Installation Restoration Program sites and one MMRP site.</p>	<p><u>Hazardous Materials Management</u> <b>LSI</b> Impacts would be similar to Alternative B.</p>	<p><u>Hazardous Materials Management</u> <b>LSI</b> Impacts would be similar to Alternatives A and C.</p>	<p><u>Hazardous Materials Management</u> <b>LSI</b> Short-term increased hazardous waste generation, storage, handling, and disposal would have the potential to result in direct impacts to human health and the environment. Although, considered less than significant, the potential direct impacts would be considerably more for the No-Action Alternative when compared to the SEIS alternatives.</p>
<p><u>Hazardous Waste Management</u> <b>LSI</b> Short-term increase in generation, transport, storage and handling of hazardous waste. Direct adverse impacts to human health and the environment from short-term increase in hazardous waste. Adherence to applicable BMPs and SOPs would minimize potential direct impact. No long-term direct or in-direct impact on the management of hazardous waste at DoD facilities on Guam.</p>	<p><u>Hazardous Waste Management</u> <b>LSI</b> Impacts would be similar to Alternative A.</p>	<p><u>Hazardous Waste Management</u> <b>LSI</b> Impacts would be similar to Alternative A.</p>	<p><u>Hazardous Waste Management</u> <b>LSI</b> Impacts would be similar to Alternative A.</p>	<p><u>Hazardous Waste Management</u> <b>LSI</b> Impacts would be similar to Alternative A.</p>	<p><u>Hazardous Waste Management</u> <b>LSI</b> Impacts would be similar to Alternative A. Although, considered less than significant, the potential direct impacts would be considerably more for the No-Action Alternative when compared to the SEIS alternatives.</p>

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**Table 4.7-1. Summary of Impacts and Potential Mitigation Measures for the Cantonment/Family Housing Alternatives**

<b><i>Finegayan (Alternative A)</i></b>	<b><i>Finegayan/South Finegayan (Alternative B)</i></b>	<b><i>Andersen Air Force Base (Alternative C)</i></b>	<b><i>Barrigada (Alternative D)</i></b>	<b><i>Finegayan/Andersen Air Force Base (Alternative E)</i></b>	<b><i>No-Action Alternative</i></b>
<p><u>Contaminated Sites</u> <b>LSI</b> Project design would avoid overlap with contaminated sites. Various BMPs and construction operational protocol would be followed if relocation of construction projects is not possible. Special design techniques and methodology would be required to ensure the long-term structural integrity of proposed construction projects.</p>	<p><u>Contaminated Sites</u> <b>LSI</b> Impacts would be similar to Alternative A, except No MMRP sites were identified in the area of South Finegayan proposed for development for family housing under Alternative B.</p>	<p><u>Contaminated Sites</u> <b>LSI</b> Impacts would be similar to Alternative A.</p>	<p><u>Contaminated Sites</u> <b>LSI</b> Impacts would be similar to Alternative A.</p>	<p><u>Contaminated Sites</u> <b>LSI</b> Impacts would be similar to Alternative A.</p>	<p><u>Contaminated Sites</u> <b>LSI</b> Impacts would be similar to Alternative A.</p>
<p><u>Toxic Substances</u> <b>LSI</b> Demolition of older buildings and/or utilities may result in encountering PCBs, ACM and LBP that were used in the older building materials. Toxic substances would not be utilized for new construction. Because the proposed construction areas are located in a USEPA Radon Zone 1, it is possible that new buildings, facilities, and structures could encounter radon intrusion. To minimize this impact, radon resistant construction techniques and potential mitigation systems would be incorporated into the building/facility designs. In addition, DoD would periodically test facilities constructed in known radon zones to verify that no unacceptable radon gas buildup occurs and install radon mitigation systems as appropriate.</p>	<p><u>Toxic Substances</u> <b>LSI</b> Impacts would be similar to Alternative A.</p>	<p><u>Toxic Substances</u> <b>LSI</b> Impacts would be similar to Alternative A.</p>	<p><u>Toxic Substances</u> <b>LSI</b> Impacts would be similar to Alternative A.</p>	<p><u>Toxic Substances</u> <b>LSI</b> Impacts would be similar to Alternative A.</p>	<p><u>Toxic Substances</u> <b>LSI</b> Impacts would be similar to Alternative A.</p>
<p><b>Operation Impacts</b> <u>Hazardous Materials Management</u> <b>LSI</b> Long-term, direct impact from increase in transport/transfer of hazardous materials, primarily from use of POL. Current hazardous materials handling, storage, and disposal capacity is sufficient. BMPs and SOPs would minimize potential direct or indirect impacts. Training use would be in compliance with MCO P5090.2A. Existing hazardous waste accumulation sites would be maintained to support the proposed cantonment/family housing area and a 90-day accumulation area would be provided. In addition, an undetermined number of satellite accumulation sites would be created, as needed, in proximity to hazardous materials use and hazardous waste generation to support cantonment activities.</p>	<p><b>Operation Impacts</b> <u>Hazardous Materials Management</u> <b>LSI</b> Impacts would be similar to Alternative A.</p>	<p><b>Operation Impacts</b> <u>Hazardous Materials Management</u> <b>LSI</b> Impacts would be similar to Alternative A.</p>	<p><b>Operation Impacts</b> <u>Hazardous Materials Management</u> <b>LSI</b> Impacts would be similar to Alternative A.</p>	<p><b>Operation Impacts</b> <u>Hazardous Materials Management</u> <b>LSI</b> Impacts would be similar to Alternative A.</p>	<p><b>Operation Impacts</b> <u>Hazardous Materials Management</u> <b>LSI</b> Long-term increased hazardous materials storage, handling, and disposal. Increase potential for minor spill, leak, or release direct impacts from long-term increased vehicular traffic.</p>
<p><u>Hazardous Waste Management</u> <b>LSI</b> Increase in transport/transfer of hazardous waste on Guam from increased population. New satellite hazardous waste storage areas would be created in proximity to hazardous materials use and hazardous waste generation, and would be managed with applicable regulations.</p>	<p><u>Hazardous Waste Management</u> <b>LSI</b> Impacts would be similar to Alternative A.</p>	<p><u>Hazardous Waste Management</u> <b>LSI</b> Impacts would be similar to Alternative A.</p>	<p><u>Hazardous Waste Management</u> <b>LSI</b> Impacts would be similar to Alternative A.</p>	<p><u>Hazardous Waste Management</u> <b>LSI</b> Impacts would be similar to Alternative A.</p>	<p><u>Hazardous Waste Management</u> <b>LSI</b> Impacts would be similar to Alternative A. Long-term increased requirement for off-island hazardous waste disposal. Long-term increases to DRMO's hazardous waste storage, handling, and disposal capacity. New hazardous waste accumulation areas established.</p>

Legend: **SI** = significant impact; **SI-M** = significant impact-mitigable; **LSI** = less than significant impact; **NI** = no impact; **BI** = beneficial impact.



**Table 4.7-1. Summary of Impacts and Potential Mitigation Measures for the Cantonment/Family Housing Alternatives**

<b><i>Finegayan (Alternative A)</i></b>	<b><i>Finegayan/South Finegayan (Alternative B)</i></b>	<b><i>Andersen Air Force Base (Alternative C)</i></b>	<b><i>Barrigada (Alternative D)</i></b>	<b><i>Finegayan/Andersen Air Force Base (Alternative E)</i></b>	<b><i>No-Action Alternative</i></b>
<u>Contaminated Sites</u> <b>LSI</b> Direct or indirect impacts to contaminated sites from operations would be less than significant. Any potentially contaminated sites would be assessed and remediated, as appropriate, for the proposed reuse of the site. Operational activities would not disturb any remediation sites or controls or interfere with monitoring areas.	<u>Contaminated Sites</u> <b>LSI</b> Impacts would be similar to Alternative A.	<u>Contaminated Sites</u> <b>LSI</b> Impacts would be similar to Alternative A.	<u>Contaminated Sites</u> <b>LSI</b> Impacts would be similar to Alternative A.	<u>Contaminated Sites</u> <b>LSI</b> Impacts would be similar to Alternative A.	<u>Contaminated Sites</u> <b>LSI</b> Impacts would be similar to Alternative A. Potential impacts to existing IRP/MMRP sites.
<u>Toxic Substances</u> <b>LSI</b> No significant environmental consequences from ACM, LBP, and PCBs are anticipated. ACM and gases would not be transported or transferred as a result of these activities. Existing BMPs and SOPs would be followed minimizing the potential for releases to the environment. Cantonment operations would have no direct or indirect impact on ACM, LBP, and PCBs. ACM, LBP, and PCBs would not be used in new facilities on Guam. Because the proposed construction areas are located in a USEPA Radon Zone 1, it is possible that new buildings, facilities, and structures could encounter radon intrusion. To minimize this impact, radon resistant construction techniques and mitigation systems would be incorporated into the building/facility designs. In addition, DoD would periodically test facilities constructed in known radon zones to verify that no unacceptable radon gas buildup occurs and install radon mitigation systems as appropriate.	<u>Toxic Substances</u> <b>LSI</b> Impacts would be similar to Alternative A.	<u>Toxic Substances</u> <b>LSI</b> Impacts would be similar to Alternative A.	<u>Toxic Substances</u> <b>LSI</b> Impacts would be similar to Alternative A.	<u>Toxic Substances</u> <b>LSI</b> Impacts would be similar to Alternative A.	<u>Toxic Substances</u> <b>LSI</b> Impacts would be similar to Alternative A.
<b>PUBLIC HEALTH AND SAFETY</b>					
<b>Construction Impacts</b>	<b>Construction Impacts</b>	<b>Construction Impacts</b>	<b>Construction Impacts</b>	<b>Construction Impacts</b>	<b>Construction Impacts</b>
<u>Notifiable Diseases</u> <b>LSI</b> Potential increase in STDs, notifiable diseases, and mental illness due to increase in population. No adverse impact to health care centers. Implementation of BMPs would reduce potential water-related disease outbreak.	<u>Notifiable Diseases</u> <b>LSI</b> Impacts would be similar to Alternative A.	<u>Notifiable Diseases</u> <b>LSI</b> Impacts would be similar to Alternative A.	<u>Notifiable Diseases</u> <b>LSI</b> Impacts would be similar to Alternative A.	<u>Notifiable Diseases</u> <b>LSI</b> Impacts would be similar to Alternative A.	<u>Notifiable Diseases</u> <b>LSI</b> Less than significant impacts to health care services from increases in notifiable diseases and mental illness.
<u>Mental Illness</u> <b>LSI</b> A potential increase in mental illness occurrences due to the addition of military personnel and dependents, construction workforce, as well as the natural and induced population increase.	<u>Mental Illness</u> <b>LSI</b> Impacts would be similar to Alternative A.	<u>Mental Illness</u> <b>LSI</b> Impacts would be similar to Alternative A.	<u>Mental Illness</u> <b>LSI</b> Impacts would be similar to Alternative A.	<u>Mental Illness</u> <b>LSI</b> Impacts would be similar to Alternative A.	<u>Mental Illness</u> <b>LSI</b> Impacts would be similar to Alternative A.

Legend: **SI** = significant impact; **SI-M** = significant impact-mitigable; **LSI** = less than significant impact; **NI** = no impact; **BI** = beneficial impact.

**Table 4.7-1. Summary of Impacts and Potential Mitigation Measures for the Cantonment/Family Housing Alternatives**

<b><i>Finegayan (Alternative A)</i></b>	<b><i>Finegayan/South Finegayan (Alternative B)</i></b>	<b><i>Andersen Air Force Base (Alternative C)</i></b>	<b><i>Barrigada (Alternative D)</i></b>	<b><i>Finegayan/Andersen Air Force Base (Alternative E)</i></b>	<b><i>No-Action Alternative</i></b>
<u>Operational Safety</u> <b>NI</b> No direct or indirect impacts to public, military personnel, or worker safety are expected from potential construction hazards because a health and safety program would be implemented for construction contractors and the public would be excluded from construction areas.	<u>Operational Safety</u> <b>NI</b> Impacts would be similar to Alternative A.	<u>Operational Safety</u> <b>NI</b> Impacts would be similar to Alternative A. The areas proposed for the cantonment and housing at AAFB are situated outside of the APZs.	<u>Operational Safety</u> <b>NI</b> Impacts would be similar to Alternative A.	<u>Operational Safety</u> <b>NI</b> Impacts would be similar to Alternatives A and C.	<u>Operational Safety</u> <b>NI</b> Impacts would be similar to Alternative A.
<u>Environmental Health Effects</u> <b>LSI</b> Direct and indirect impacts from a short-term increase in construction noise would be less than significant. Wellhead protection zones and construction BMPs would minimize risk of potential groundwater contamination during construction.	<u>Environmental Health Effects</u> <b>LSI</b> Impacts would be similar to Alternative A. Long-term operational noise from activities occurring within the cantonment and housing areas would be similar to current noise levels.	<u>Environmental Health Effects</u> <b>LSI</b> Impacts would be similar to Alternative A. Long-term operational noise at AAFB would be similar to current noise levels. The area proposed for the cantonment and housing are within the 60 to 70 dB noise range and are compatible with residential development.	<u>Environmental Health Effects</u> <b>LSI</b> Impacts would be similar to Alternative A. Long-term operational noise from activities occurring within the cantonment and housing areas would be similar to current noise levels.	<u>Environmental Health Effects</u> <b>LSI</b> Impacts would be similar to Alternative A and C.	<u>Environmental Health Effects</u> <b>LSI</b> Less than significant direct impacts due to short-term construction noise.
<u>Hazardous Substances</u> <b>NI</b> Short and long-term increase in the use, handling, storage, transportation, and disposition of hazardous substances. Existing IRP sites would not affect the proposed development and is not near an off-site population.	<u>Hazardous Substances</u> <b>NI</b> Impacts would be similar to Alternative A.	<u>Hazardous Substances</u> <b>NI</b> Impacts would be similar to Alternative A.	<u>Hazardous Substances</u> <b>NI</b> Impacts would be similar to Alternative A.	<u>Hazardous Substances</u> <b>NI</b> Impacts would be similar to Alternative A.	<u>Hazardous Substances</u> <b>NI</b> Impacts would be similar to Alternative A.
<u>Unexploded Ordnance</u> <b>LSI</b> Because UXO would be identified and removed prior to initiating construction activities and construction personnel would be trained as to the hazards associated with unexploded military munitions, potential direct impacts from encounters with UXO would be minimized and less than significant.	<u>Unexploded Ordnance</u> <b>LSI</b> Impacts would be similar to Alternative A.	<u>Unexploded Ordnance</u> <b>LSI</b> Impacts would be similar to Alternative A.	<u>Unexploded Ordnance</u> <b>LSI</b> Impacts would be similar to Alternative A.	<u>Unexploded Ordnance</u> <b>LSI</b> Impacts would be similar to Alternative A.	<u>Unexploded Ordnance</u> <b>LSI</b> Less than significant direct impacts due to potential contact with UXO.
<u>Traffic Incidents</u> <b>LSI</b> Potential for a small increase in the number of traffic accidents, primarily during operation because of the increase in population, but potentially also during construction activities.	<u>Traffic Incidents</u> <b>LSI</b> Impacts would be similar to Alternative A.	<u>Traffic Incidents</u> <b>LSI</b> Impacts would be similar to Alternative A.	<u>Traffic Incidents</u> <b>LSI</b> Impacts would be similar to Alternative A.	<u>Traffic Incidents</u> <b>LSI</b> Impacts would be similar to Alternative A.	<u>Traffic Incidents</u> <b>LSI</b> Less than significant impacts due to potential increase in traffic incidents.
<b>Operation Impacts</b> <u>Notifiable Diseases</u> <b>LSI</b> Similar to the construction impacts, operations would result in less than significant impacts to health care services from increases in illnesses related to notifiable diseases and mental illness.	<b>Operation Impacts</b> <u>Notifiable Diseases</u> <b>LSI</b> Impacts would be similar to Alternative A.	<b>Operation Impacts</b> <u>Notifiable Diseases</u> <b>LSI</b> Impacts would be similar to Alternative A.	<b>Operation Impacts</b> <u>Notifiable Diseases</u> <b>LSI</b> Impacts would be similar to Alternative A.	<b>Operation Impacts</b> <u>Notifiable Diseases</u> <b>LSI</b> Impacts would be similar to Alternative A.	<b>Operation Impacts</b> <u>Notifiable Diseases</u> <b>LSI</b> Less than significant impacts to health care services from increases in notifiable diseases.
<u>Mental Illness</u> <b>LSI</b> Similar to the construction impacts, operations would result in increase in mental illness occurrences due to the addition of military personnel and dependents, construction workforce, as well as the natural and induced population increase.	<u>Mental Illness</u> <b>LSI</b> Impacts would be similar to Alternative A.	<u>Mental Illness</u> <b>LSI</b> Impacts would be similar to Alternative A.	<u>Mental Illness</u> <b>LSI</b> Impacts would be similar to Alternative A.	<u>Mental Illness</u> <b>LSI</b> Impacts would be similar to Alternative A.	<u>Mental Illness</u> <b>LSI</b> Impacts would be similar to Alternative A.

Legend: **SI** = significant impact; **SI-M** = significant impact-mitigable; **LSI** = less than significant impact; **NI** = no impact; **BI** = beneficial impact.

**Table 4.7-1. Summary of Impacts and Potential Mitigation Measures for the Cantonment/Family Housing Alternatives**

<i>Finegayan (Alternative A)</i>	<i>Finegayan/South Finegayan (Alternative B)</i>	<i>Andersen Air Force Base (Alternative C)</i>	<i>Barrigada (Alternative D)</i>	<i>Finegayan/Andersen Air Force Base (Alternative E)</i>	<i>No-Action Alternative</i>
<p><u>Operational Safety</u> <b>NI</b> Similar to construction impacts, operations would result in no impacts to operational safety.</p>	<p><u>Operational Safety</u> <b>NI</b> Impacts would be similar to Alternative A.</p>	<p><u>Operational Safety</u> <b>SI</b> In the event of a munitions transport incident or explosives incident at the North Gate, a significant direct impact related to explosive safety could occur.</p> <p><b>Potential Mitigation</b> <b>No Mitigation. Siting the proposed cantonment/family housing in another location would be required to eliminate the potential need for evacuations in the event of a munitions transportation mishap.</b></p>	<p><u>Operational Safety</u> <b>NI</b> Impacts would be similar to Alternative A.</p>	<p><u>Operational Safety</u> <b>NI</b> Impacts would be similar to Alternative A.</p>	<p><u>Operational Safety</u> <b>NI</b> Similar to construction impacts, operations would result in no impacts to operational safety.</p>
<p><u>Environmental Health Effects</u> <b>LSI</b> Similar to the construction impacts, operations would result in less than significant direct impacts due to long-term operations noise. Operations would result in less than significant direct impacts to water quality as a result of increased long-term demand and potential water related illness.</p>	<p><u>Environmental Health Effects</u> <b>LSI</b> Impacts would be similar to Alternative A.</p>	<p><u>Environmental Health Effects</u> <b>LSI</b> Impacts would be similar to Alternative A.</p>	<p><u>Environmental Health Effects</u> <b>LSI</b> Impacts would be similar to Alternative A.</p>	<p><u>Environmental Health Effects</u> <b>LSI</b> Impacts would be similar to Alternative A.</p>	<p><u>Environmental Health Effects</u> <b>LSI</b> Impacts would be similar to Alternative A, there would be less than significant long-term direct impacts to water quality and noise.</p>
<p><u>Hazardous Substances</u> <b>NI</b> Similar to construction impacts, operations would result in no impacts to hazardous substances use.</p>	<p><u>Hazardous Substances</u> <b>NI</b> Impacts would be similar to Alternative A.</p>	<p><u>Hazardous Substances</u> <b>NI</b> Impacts would be similar to Alternative A.</p>	<p><u>Hazardous Substances</u> <b>NI</b> Impacts would be similar to Alternative A.</p>	<p><u>Hazardous Substances</u> <b>NI</b> Impacts would be similar to Alternative A.</p>	<p><u>Hazardous Substances</u> <b>NI</b> Similar to construction impacts, operations would result in no impacts to hazardous substances use.</p>
<p><u>Unexploded Ordnance</u> <b>LSI</b> Similar to the construction impacts, operations would result in less than significant direct impacts relative to potential contact with UXO.</p>	<p><u>Unexploded Ordnance</u> <b>LSI</b> Impacts would be similar to Alternative A.</p>	<p><u>Unexploded Ordnance</u> <b>LSI</b> Impacts would be similar to Alternative A.</p>	<p><u>Unexploded Ordnance</u> <b>LSI</b> Impacts would be similar to Alternative A.</p>	<p><u>Unexploded Ordnance</u> <b>LSI</b> Impacts would be similar to Alternative A.</p>	<p><u>Unexploded Ordnance</u> <b>LSI</b> Less than significant direct impacts due to potential contact with UXO.</p>
<p><u>Traffic Incidents</u> <b>LSI</b> Similar to the construction impacts, operations would result in less than significant long-term impacts due to potential increase in traffic incidents.</p>	<p><u>Traffic Incidents</u> <b>LSI</b> Impacts would be similar to Alternative A.</p>	<p><u>Traffic Incidents</u> <b>LSI</b> Impacts would be similar to Alternative A.</p>	<p><u>Traffic Incidents</u> <b>LSI</b> Impacts would be similar to Alternative A.</p>	<p><u>Traffic Incidents</u> <b>LSI</b> Impacts would be similar to Alternative A.</p>	<p><u>Traffic Incidents</u> <b>LSI</b> Less than significant long-term impacts due to potential increase in traffic incidents.</p>

Legend: **SI** = significant impact; **SI-M** = significant impact-mitigable; **LSI** = less than significant impact; **NI** = no impact; **BI** = beneficial impact.

**Table 4.7-1. Summary of Impacts and Potential Mitigation Measures for the Cantonment/Family Housing Alternatives**

<i>Finegayan (Alternative A)</i>	<i>Finegayan/South Finegayan (Alternative B)</i>	<i>Andersen Air Force Base (Alternative C)</i>	<i>Barrigada (Alternative D)</i>	<i>Finegayan/Andersen Air Force Base (Alternative E)</i>	<i>No-Action Alternative</i>
<b>ENVIRONMENTAL JUSTICE AND THE PROTECTION OF CHILDREN</b>					
<b>Construction and Operation Impacts</b>	<b>Construction and Operation Impacts</b>	<b>Construction and Operation Impacts</b>	<b>Construction and Operation Impacts</b>	<b>Construction and Operation Impacts</b>	<b>Construction and Operation Impacts</b>
<p><u>Noise</u> <b>LSI</b> Construction activities would result in short-term, direct noise impacts to surrounding communities, but minority, low-income, or children populations would not be disproportionately affected.</p> <p>Operational noise would not be significant and would not disproportionately affect minority, low-income, or children populations.</p>	<p><u>Noise</u> <b>LSI</b> Impacts are generally island-wide and would be the same as described for Alternative A.</p>	<p><u>Noise</u> <b>LSI</b> Impacts are generally island-wide and would be the same as described for Alternative A.</p>	<p><u>Noise</u> <b>LSI</b> Impacts are generally island-wide and would be the same as described for Alternative A.</p>	<p><u>Noise</u> <b>LSI</b> Impacts are generally island-wide and would be the same as described for Alternative A.</p>	<p><u>Noise</u> <b>LSI</b> Environmental justice impacts from noise impacts would be less than significant.</p>
<p><u>Recreation</u> <b>LSI</b> Increased construction traffic would decrease access to recreational sites, but minority, low-income, or children populations would not be disproportionately affected.</p> <p>Operationally, all people of Guam would be affected by impacts to recreational resources, so there would not be a disproportionate effect on minority, low-income, or children populations.</p>	<p><u>Recreation</u> <b>LSI</b> Impacts are generally island-wide and would be the same as described for Alternative A.</p>	<p><u>Recreation</u> <b>LSI</b> Impacts are generally island-wide and would be the same as described for Alternative A.</p>	<p><u>Recreation</u> <b>LSI</b> Impacts are generally island-wide and would be the same as described for Alternative A.</p>	<p><u>Recreation</u> <b>LSI</b> Impacts are generally island-wide and would be the same as described for Alternative A.</p>	<p><u>Recreation</u> <b>LSI</b> Environmental justice impacts from impacts to recreational resources would be less than significant.</p>
<p><u>Socioeconomics and General Services</u> <b>SI-M</b> Temporary population growth may stress some sectors of the Guam economy (e.g., housing, costs of goods and services). In the short-term (during construction), direct and indirect impacts to health services would be significant; during the steady-state period (operational phase), impacts to public health and human service agencies would be less than significant. This would be felt more severely by low-income people, who often do not have resources to buffer hard economic times. However, there would also be some economic benefits due to increased employment opportunities.</p> <p>There would be adverse and disproportionate socioeconomic impacts in terms of environmental justice on low-income populations; however, some of the socioeconomic impacts would be beneficial (e.g., economic impacts).</p> <p><b>Potential Mitigation Measures</b> The DoD would continue to support the efforts of the CMCC to develop recommendations, as appropriate, regarding adjustment of construction tempo and sequencing to directly influence workforce population levels and indirectly influence induced population growth before infrastructure capabilities are exceeded. Such support would include providing</p>	<p><u>Socioeconomics and General Services</u> <b>SI-M</b> Impacts are generally island-wide and would be the same as described for Alternative A.</p> <p><b>Potential Mitigation Measures</b> Mitigation would be the same as under Alternative A.</p>	<p><u>Socioeconomics and General Services</u> <b>SI-M</b> Impacts are generally island-wide and would be the same as described for Alternative A.</p> <p><b>Potential Mitigation Measures</b> Mitigation would be the same as under Alternative A.</p>	<p><u>Socioeconomics and General Services</u> <b>SI-M</b> Impacts are generally island-wide and would be the same as described for Alternative A.</p> <p><b>Potential Mitigation Measures</b> Mitigation would be the same as under Alternative A.</p>	<p><u>Socioeconomics and General Services</u> <b>SI-M</b> Impacts are generally island-wide and would be the same as described for Alternative A.</p> <p><b>Potential Mitigation Measures</b> Mitigation would be the same as under Alternative A.</p>	<p><u>Socioeconomics and General Services</u> <b>SI</b> The “boom and then bust” cycle of population growth and decline may stress the Guam economy and public services. This would be felt more severely by low-income people, who often do not have resources to buffer hard economic times.</p> <p><b>Potential Mitigation Measures</b> See the 2010 Final EIS, Volume 7, Chapter 2: Overview of Best Management Practices and Proposed Mitigation Measures, Table 2.2-1: Summary of Proposed Mitigation Measures (mitigations specific to Volume 2), Pages 2-25-2-45.</p>

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**Table 4.7-1. Summary of Impacts and Potential Mitigation Measures for the Cantonment/Family Housing Alternatives**

<i>Finegayan (Alternative A)</i>	<i>Finegayan/South Finegayan (Alternative B)</i>	<i>Andersen Air Force Base (Alternative C)</i>	<i>Barrigada (Alternative D)</i>	<i>Finegayan/Andersen Air Force Base (Alternative E)</i>	<i>No-Action Alternative</i>
<p>project-related employment and population forecasts, participating in the identification of shortfalls in Guam public services, and assisting in the identification of federal programs and funding sources that would help GovGuam to address shortfalls. As directed by the FY 2014 NDAA, the DoD would convene the EAC to consider necessary technical and financial assistance and develop an implementation plan coordinated with EAC federal agencies. This plan must be submitted to the congressional defense committees as part of a reporting requirement that is due no later than the date of issuance of the ROD.</p>					
<p><u>Public Health and Safety</u> <b>SI-M</b> Since the number of public health and safety professionals required to maintain current levels of service at public health and safety agencies would increase by more than 2%, and due to existing deficiencies in facilities and equipment at these agencies, there would be short-term, direct and indirect significant impacts to public health agencies and significant direct and indirect impacts on public safety agencies, both short-term (during construction) and during the steady-state period (during operation). Given that public health agencies that serve low-income and uninsured populations already have insufficient staffing levels, population increase would further strain these resources, causing a significant environmental justice impact.</p> <p><b>Potential Mitigation Measures</b> The DoD would continue to support the efforts of the CMCC to develop recommendations, as appropriate, regarding adjustment of construction tempo and sequencing to directly influence workforce population levels and indirectly influence induced population growth before infrastructure capabilities are exceeded. Such support may include providing project-related employment and population forecasts, participating in the identification of shortfalls in Guam public services, and assisting in the identification of federal programs and funding sources that may help GovGuam to address shortfalls. The FY 2014 Consolidated Appropriations Act (Public Law No. 113-76) appropriated \$13,000,000 for the construction of a regional public health laboratory on Guam;</p>	<p><u>Public Health and Safety</u> <b>SI-M</b> Impacts are generally island-wide and would be the same as described for Alternative A.</p> <p><b>Potential Mitigation Measures</b> Mitigation would be the same as under Alternative A.</p>	<p><u>Public Health and Safety</u> <b>SI-M</b> Impacts are generally island-wide and would be the same as described for Alternative A.</p> <p><b>Potential Mitigation Measures</b> Mitigation would be the same as under Alternative A.</p>	<p><u>Public Health and Safety</u> <b>SI-M</b> Impacts are generally island-wide and would be the same as described for Alternative A.</p> <p><b>Potential Mitigation Measures</b> Mitigation would be the same as under Alternative A.</p>	<p><u>Public Health and Safety</u> <b>SI-M</b> Impacts are generally island-wide and would be the same as described for Alternative A.</p> <p><b>Potential Mitigation Measures</b> Mitigation would be the same as under Alternative A.</p>	<p><u>Public Health and Safety</u> <b>SI</b> Guam’s public health care services would not be able to handle potential increases in illnesses of the medically underserved and low income populations. In addition access to public health and social services would be strained by an increase in uninsured and underinsured workers coming to Guam. Construction-related impacts are considered short-term but significant and would have a corresponding significant impact on low-income people.</p> <p><b>Potential Mitigation Measures</b> See the 2010 Final EIS, Volume 7, Chapter 2: Overview of Best Management Practices and Proposed Mitigation Measures, Table 2.2-1: Summary of Proposed Mitigation Measures (mitigations specific to Volume 2), Pages 2-25-2-45.</p>

Legend: *SI* = significant impact; *SI-M* = significant impact-mitigable; *LSI* = less than significant impact; *NI* = no impact; *BI* = beneficial impact.

**Table 4.7-1. Summary of Impacts and Potential Mitigation Measures for the Cantonment/Family Housing Alternatives**

<i>Finegayan (Alternative A)</i>	<i>Finegayan/South Finegayan (Alternative B)</i>	<i>Andersen Air Force Base (Alternative C)</i>	<i>Barrigada (Alternative D)</i>	<i>Finegayan/Andersen Air Force Base (Alternative E)</i>	<i>No-Action Alternative</i>
<p>these funds remain in place. The public health laboratory would alleviate some existing deficiencies in Guam’s public health infrastructure, and bolster Guam’s capability to meet public health demands brought about by project-related population, by providing a facility that would help identify, treat, and control diseases of public health concern. As directed by the FY 2014 NDAA, the DoD would convene the EAC to consider necessary technical and financial assistance and develop an implementation plan coordinated with EAC federal agencies. This plan must be submitted to the congressional defense committees as part of a reporting requirement that is due no later than the date of issuance of the ROD.</p> <p><b>LSI</b> There would be less than significant impacts to health care services. Less than significant impacts are anticipated from noise, water quality, UXO, and traffic incidents due to the increase in military personnel and natural population increase. There would be a less than significant environmental justice impacts from impacts to these resources.</p>	<p><b>LSI</b> Impacts are generally island-wide and would be the same as described for Alternative A.</p>	<p><b>LSI</b> Impacts are generally island-wide and would be the same as described for Alternative A.</p>	<p><b>LSI</b> Impacts are generally island-wide and would be the same as described for Alternative A.</p>	<p><b>LSI</b> Impacts are generally island-wide and would be the same as described for Alternative A.</p>	

Legend: **SI** = significant impact; **SI-M** = significant impact-mitigable; **LSI** = less than significant impact; **NI** = no impact; **BI** = beneficial impact.

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