

## CHAPTER 14.

# CULTURAL RESOURCES

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### 14.1 INTRODUCTION

This chapter describes the potential environmental consequences to cultural resources associated with implementing the alternatives within the region of influence. For a description of the affected environment for all resources, refer to the respective chapter of Volume 2. The locations described in Volume 2 include the region of influence for the utilities and roadway related project components of the proposed action. The chapters are presented in the same order as the resource areas contained in Volume 6.

### 14.2 ENVIRONMENTAL CONSEQUENCES

#### 14.2.1 Approach to Analysis

##### 14.2.1.1 Methodology

###### Utilities

The methodology for identifying, evaluating, and mitigating impacts to cultural resources has been established through federal laws and regulations including the National Historic Preservation Act (NHPA) and the Archaeological Resource Protection Act.

Under the NHPA, a significant resource is a cultural resource listed or eligible for listing on the National Historic Places (NRHP) or is a historic property. A project affects a historic property when it alters the resource's characteristics, including relevant features of its environment or features that qualify it for inclusion on the NRHP. Adverse effects may include the following: physical destruction, damage, or alteration of all or part of the resources; alteration of the character of the surrounding environment that contributes to the resource's qualifications for the NRHP; introduction of visual, audible, or atmospheric elements that are out of character with the resource; neglect of the resource resulting in its deterioration or destruction; and transfer, lease, or sale of the property (36 Code of Federal Regulations [CFR] § 800.5(a)(2)) without adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the property's historic significance.

Analysis of potential impacts to historic properties considers both direct and indirect impacts. Direct impacts are impacts that "may occur from the project, such as the destruction of the property" (National Park Service [NPS] 1997:1). Indirect impacts "may be visual, audible, or atmospheric changes which effect the setting of the property" (NPS 1997:1). Cumulative impacts on historic properties under NEPA result from the incremental impact of the action when added to other past, present, and future actions. Cumulative impacts are discussed in Volume 7.

Vandalism is considered a significant impact because it damages the integrity of the site, which is a major determinant of NRHP-eligibility. Physical evidence left in historic properties is finite and cannot renew itself once it has been disturbed. For this reason, federal activities that open up areas to the public or that involve personnel traveling through an area may have an adverse impact, especially if vandalism to historic properties in the vicinity occurs.

### Roadway Projects

All project Areas of Potential Effect (APE) were inspected by cultural resources experts and Guam State Historic Preservation Office (Guam SHPO) personnel. In some cases, it was determined that more fieldwork would be required, as described below. NHPA Section 106 allows for projects to result in a finding of “no historic properties affected” (sometimes listed as “no effect”), “no adverse effect,” or “adverse effect,” as defined below.

- **No Historic Properties Affected (No Effect):** There are either no historic properties present in the APE, or there are historic properties present in the APE, but the undertaking would have no effect on them as defined in 36 CFR § 800.16(i).
- **No Adverse Effect:** There could be an effect on a historic property, but the effect would not be harmful to those characteristics that qualify the property for inclusion in or eligibility for the NRHP.
- **Adverse Effect:** Project impacts may directly or indirectly alter any of the characteristics that qualify the property for inclusion in the NRHP in a manner that would diminish the integrity of the property’s location, design, setting, materials, workmanship, feeling, or association, or a property’s ability to offer research potential.

The criteria of adverse effect described in the guidelines for NHPA Section 106 (36 CFR § 800.5) define adverse effects to significant cultural resources as any of the following actions, regardless of whether they occur singly or in combination with one another:

- Physical destruction of or damage to all or part of the resource
- Alteration of a resource, including restoration, rehabilitation, repair, maintenance, stabilization, hazardous material remediation, and provision of handicapped access that is not consistent with the Secretary’s standards for the treatment of historic properties (36 CFR 68) and applicable guidelines
- Removal of the resource from its historic location
- Change of the character of the resource’s use or of physical features within the setting that contribute to its historic significance
- Introduction of visual, atmospheric, or audible elements that diminish the integrity of the property’s significant historic features
- Neglect of a property that causes its deterioration, except where such neglect and deterioration are recognized qualities of a property of religious and cultural significance to an Indian tribe

The Federal Highway Administration (FHWA) understands that there may be undocumented properties in some locations, such as subsurface archaeological sites, or properties hidden in dense vegetation. For this reason, ongoing consultation is contributing to development of a plan to test and monitor areas where FHWA found the potential for undocumented historic properties is higher.

#### 14.2.1.2 Determination of Significance under NEPA

In this document, a historic property is a property that is listed on or eligible for listing on the NRHP. For cultural resources a significant adverse impact is one that disturbs the integrity of a historic property. If a project disturbs the characteristics that make the property listed or eligible for listing on the NRHP, then it is also considered to be a significant adverse impact.

The Regional Integrated Cultural Resources Management Plan (ICRMP) for Navy property on Guam has established Standard Operating Procedures (SOPs) to protect known historic properties; procedures for managing the inadvertent discovery of archaeological resources, inadvertent discovery of human remains, inadvertent disturbance to historic properties; and distributing permits for archaeological investigations (Tomonari-Tuggle et al. 2005). In addition, agreements on limitations in training have been made as part of the Mariana Islands Training Range Complex Environmental Impact Statement Programmatic Agreement (PA) (Navy 2009). Areas with limited or no training stipulations at Apra Harbor and the Naval Munitions Site are presented in Volume 2, Chapter 12, Cultural Resources (Figure 12.1-1 for Apra Harbor and Figure 12.1-2 for the Naval Munitions Site). Lands managed by the Marine Corps would comply with all cultural resources requirements in accordance with MCO P5090.2A, Chapter 2, Chapter 8: Cultural Resource Management on both federal and leased lands.

As part of the Section 106 consultation process for the Joint Guam relocation, a PA for all military training activities, construction, and operations proposed under the proposed action, preferred alternative that includes additional mitigation measures and procedures is being prepared. Current signatories to this proposed PA are: the Department of Defense (DoD) (Joint Region Marianas; DoD Representative Guam, Commonwealth of the Northern Mariana Islands, Federated States of Micronesia, and Republic of Palau; Marines; Navy; Army; Air Force), other federal agencies (Advisory Council for Historic Preservation (ACHP), and the NPS), and local government agencies (Guam SHPO, Commonwealth of the Northern Mariana Islands HPO). Stipulations in the proposed PA include the following:

- The DoD would ensure that the identification and evaluation of historic properties within the APE for the project is completed prior to the initiation of any part of the project with the potential to affect historic properties. Newly discovered properties would be avoided where possible.
- For areas or properties that have not been inventoried for historic properties, the DoD would record surface sites and, when possible, areas would also be archaeologically sampled for subsurface sites when easily obtainable (i.e., without having to demolish existing facilities or infrastructure) unless this demolition is required for the project.
- Any properties not evaluated shall be assessed for NRHP eligibility. These historic properties would be incorporated into existing ICRMPs as they are revised or updated or if a new ICRMP is developed in consultation with the appropriate SHPO.

In recognition of the significance that many historic properties within the APE of the proposed action has to various cultural groups, the DoD would generally look favorably on affording access to archaeological sites to individuals and organizations that attach significance to these historic properties where security requirements are not prohibitive. The proposed PA also provides stipulations for treatment in case of emergencies, inadvertent discoveries, the review process, and report requirements. The SOPs in the current regional ICRMP would be updated, revised, and attached to the proposed PA.

#### Off Base Roadway Projects

The off base roadway projects are not included in the proposed PA discussed above. FHWA is consulting with Guam SHPO and various consulting parties on each roadway project individually. Recognizing that some historic properties may not be identified during the Section 106 process, this ongoing consultation is contributing to development of a plan to test and monitor areas where the potential for undocumented properties is higher.

For off base roadway projects, a significant adverse impact is one that disturbs the integrity of a historic property. An impact would also be significant and adverse if a project would alter the characteristics that make a property eligible for listing on the NRHP. For the purposes of this document, impacts may be mitigated to less than significant.

#### 14.2.1.3 Issues Identified during the Public Scoping Process

The following analysis focuses on possible impacts to cultural resources; archaeological, architectural, and traditional cultural properties that could be affected by the proposal. As part of the analysis, concerns relating to cultural resources that were mentioned by the public, including regulatory stakeholders, during the public scoping meetings were addressed. A general account of these comments, including issues other than cultural resources is as follows:

- Access to cultural sites
- Construction impacts to cultural resources
- The need to conduct thorough and adequate data collection
- Public participation in the planning process relating to cultural resources

Other cultural issues identified included:

- Access to traditional plant and fishing areas
- Curation of artifacts off island and storage issues associated with the Guam Museum

Public outreach for the military relocation as a whole has included roadway projects. Augmenting this effort, FHWA is furthering consultation on roadway projects, pursuant to 36 CFR 800.2 and 800.3. Consultation with Guam SHPO is ongoing, but formal consultation to date (including meetings, field visits, and submittals) has occurred on December 5, 2008; February 26, 2009; October 22, 2009; February 23, 2010; February 26, 2010; April 15, 2010; and June 2010. Additional consultation via phone or e-mail occurs frequently.

Initial consultation discussed the off base roadway projects, the APE, the level of work effort, and the expectations for each project. It included outlining the number of types of projects associated with the roadway projects and summarizing them by project type and by those that do and do not exceed existing rights-of-way.

Subsequent consultation included touring project locations with project staff and staff from Guam SHPO. These visits indicated areas where findings of No Historic Properties Affect may be appropriate and historic properties along project roadways and the potential for undocumented properties were discussed. Hagatna (Agana) Bridge (Guam Road Network [GRN] project #4) was visited, discussed, and photographed. Field trips included discussing potential adverse effects and mitigation for to the Hagatna (Agana) Bridge.

Pursuant to 36 CFR 800.3, 15 invitations to consulting parties have been extended, and consulting party meetings have been initiated. Discussions with consulting parties include each project, possible impacts to historic properties of all sorts, and the presence of possible traditional cultural properties.

### 14.2.2 Power

#### 14.2.2.1 Basic Alternative 1: Recondition up to Five Existing Guam Power Authority–Permitted Facilities to Provide Peaking Power/Reserve Capacity

Basic Alternative 1 would recondition existing Combustion Turbines (CTs) and upgrade Transmission and Distribution (T&D) systems and would not require new construction or enlargement of the existing

footprint of the facility. This work would be undertaken by the Guam Power Authority on its existing permitted facilities. Reconditioning would be made to existing permitted facilities at the Marbo, Yigo, Dededo (two units), and Macheche CTs. These CTs are not currently being used up to permit limits. T&D system upgrades would be on existing above ground and underground transmission lines. This alternative supports Main Cantonment Alternatives 1 and 2 and Main Cantonment Alternatives 3 and 8 would require additional upgrades to the T&D system.

It is anticipated that these facilities would require general overhaul, capability testing, and controlled startup that could take up to 12 months. The amount of improvements needed would not be known until the units are inspected and tested. The NRHP eligibility of the Guam Power Authority power plants is unknown; however, most are between 15 to 20 years old.

Basic Alternative 1 would also involve T&D upgrades both above ground and below ground. Approximately 90% of the APE have been surveyed for archaeological resources (Dixon et al. 2010). Most of the utilities would be placed in previously disturbed areas. Two historic properties would be directly affected by construction of power lines (T-U-4 and T-U-11). The locations of the utilities in relation to archaeological probability areas are shown in Figure 14.2-1 through Figure 14.2-4. No historic properties were found at the Marbo Power Plant. Other underground power lines would be constructed in the roadways along Routes 1 and 3. These utility lines would be placed in previously disturbed areas adjacent to the roads. However, one site, 08-1350 (a water catchment site of the early American period), is very near a proposed powerline and could be inadvertently damaged during construction.

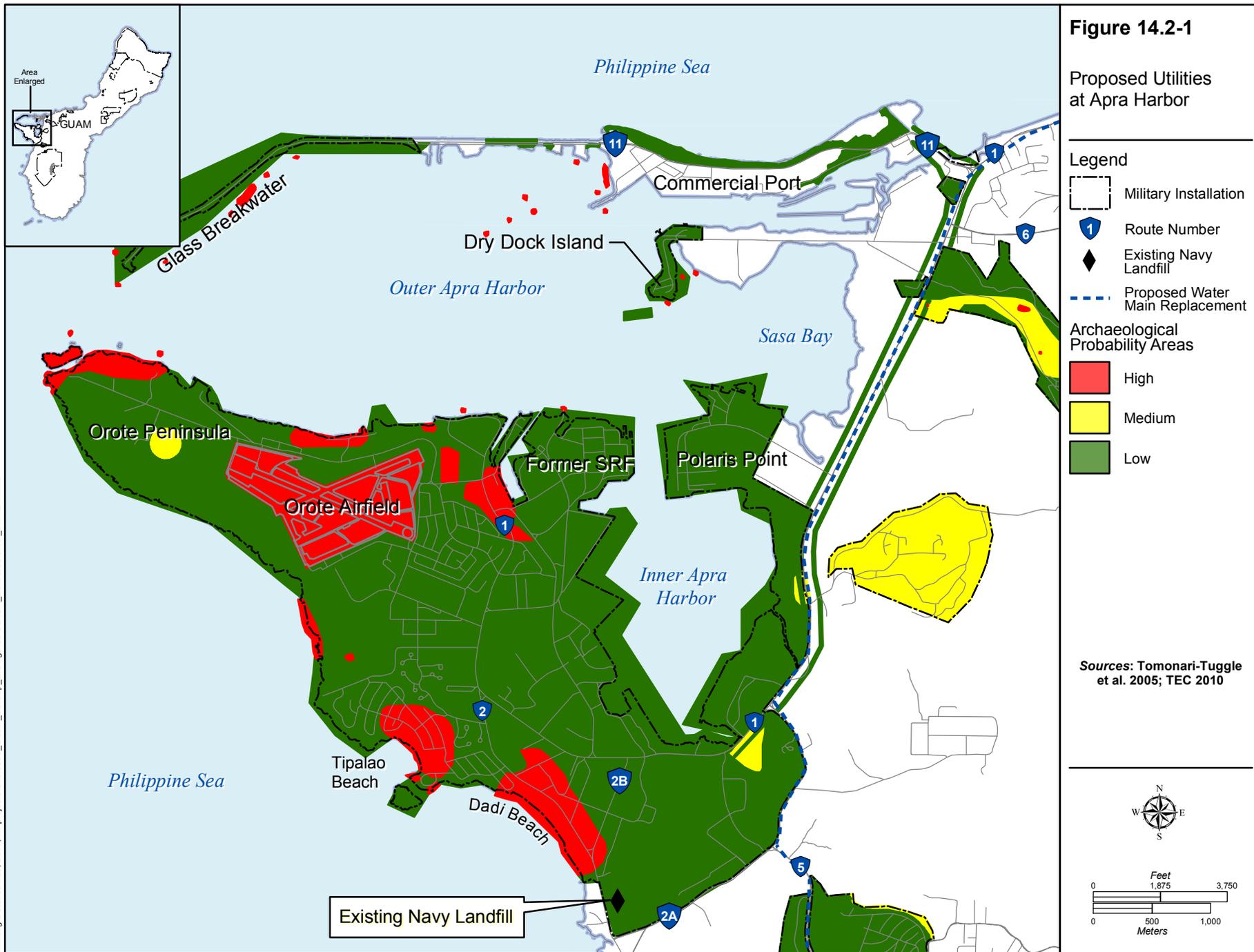
Operations associated with Basic Alternative 1 would not have significant direct or indirect impacts on historic properties, as operations would not bring an influx of people into the area and operational activities are unlikely to cause erosion. Because it is an existing activity, operations would not change the visual or audible setting near historic properties that are important for these reasons.

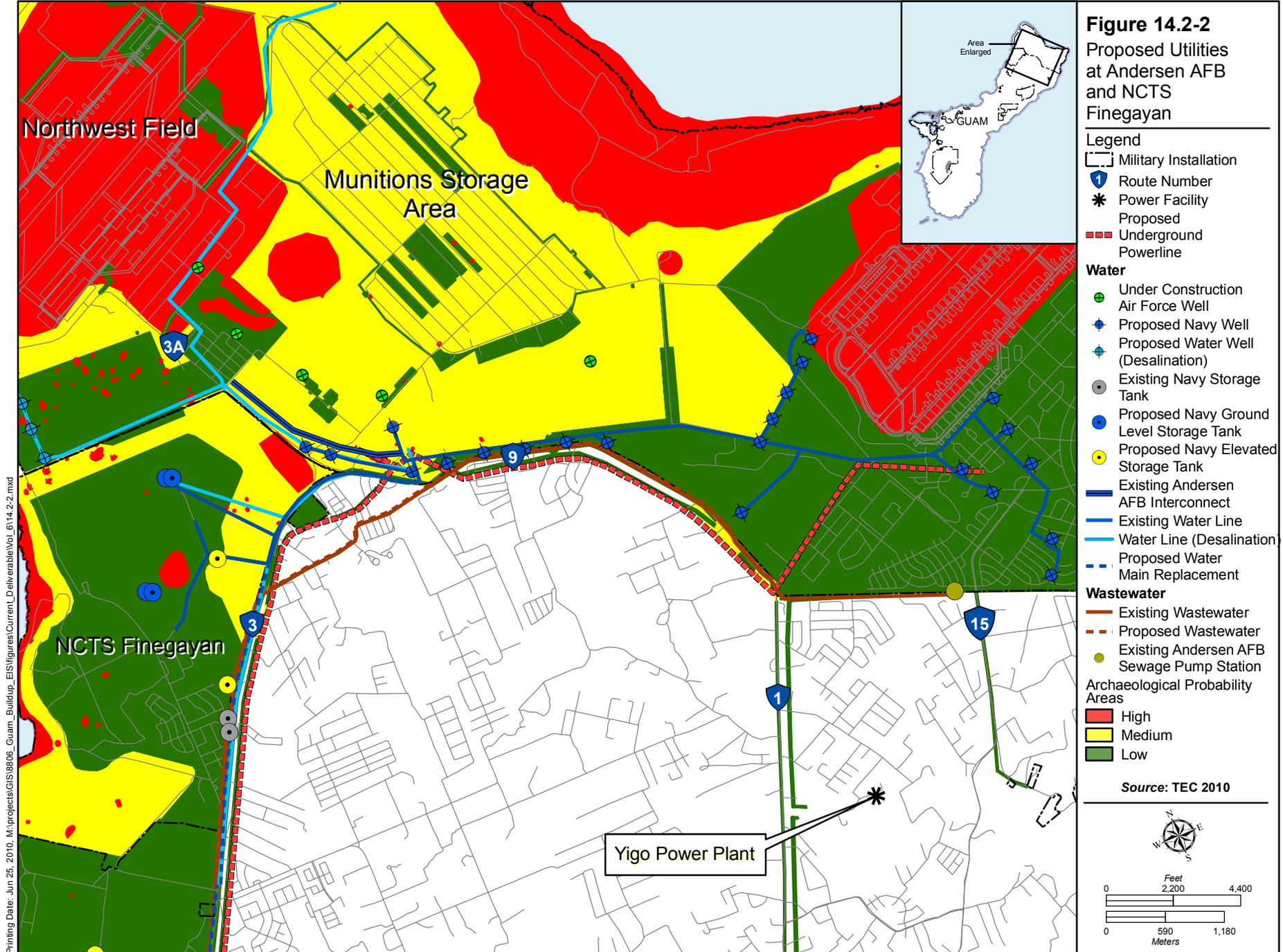
Best Management Practices (BMPs) implemented to protect cultural resources include:

- Archaeological monitoring of medium archaeological probability areas during construction in consultation with the Historic Preservation Officer.
- For post review discoveries, an assessment would be made for NRHP eligibility in consultation with the Historic Preservation Office.
- For areas or properties that have not been inventoried for historic properties, the DoD would follow SOPs as outlined in the ICRMP and any existing agreements.

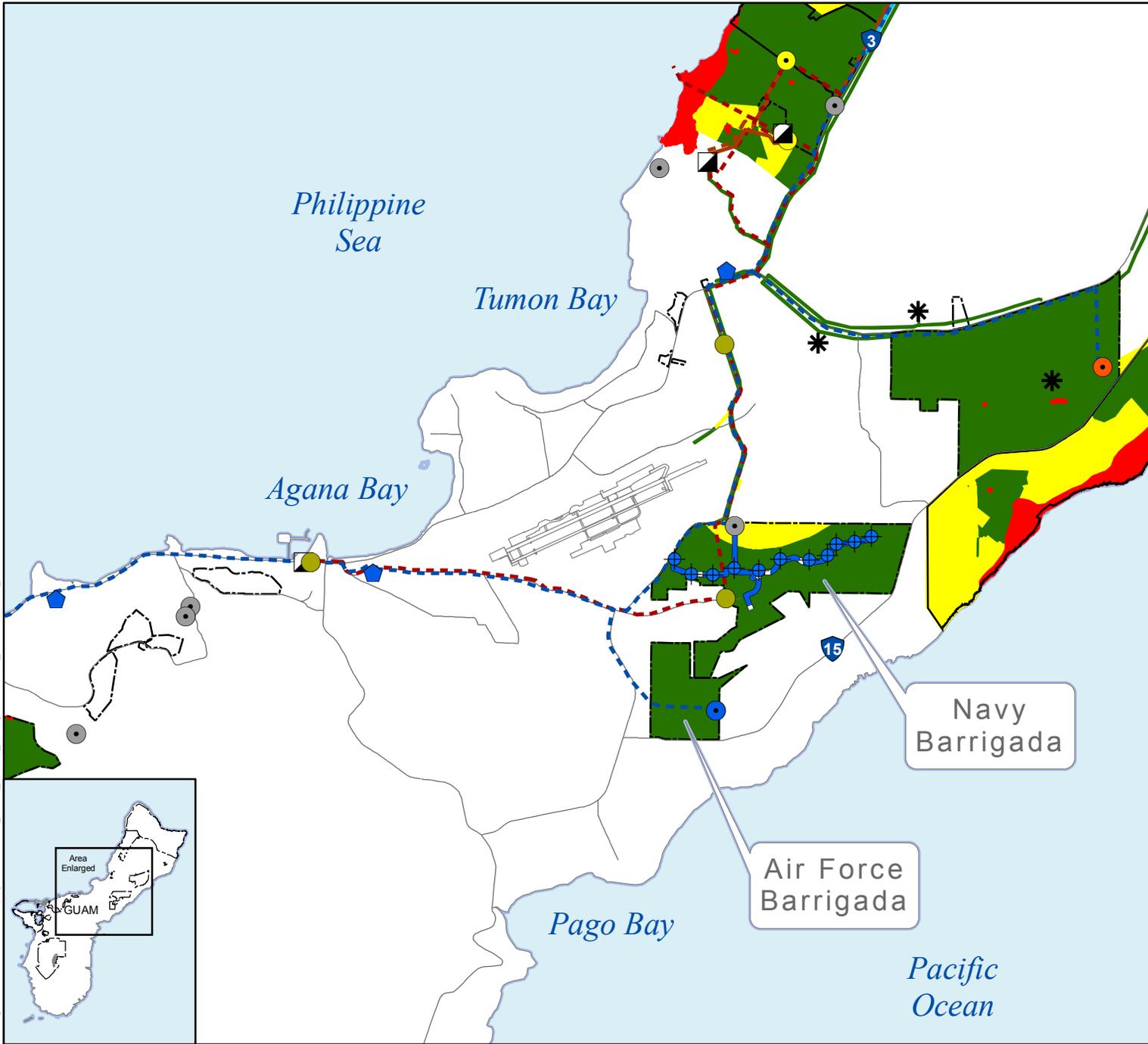
#### Proposed Mitigation Measures

Basic Alternative 1 would have significant adverse direct impacts to two historic properties (T-U-4 and T-U-11). Impacts to these two historic properties would be mitigated through data recovery as these sites are eligible under Criterion D and recovery efforts would follow the ACHP guidance, Resolving Adverse Effects through Recovery of Significant Information from Archeological Sites (ACHP 1999). Through data recovery these impacts would be reduced to a less than significant level. A table with the area, site number, impact, NRHP criteria of significance, and potential mitigation measures for each resource is included in Volume 9, Appendix G.





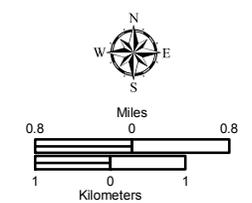
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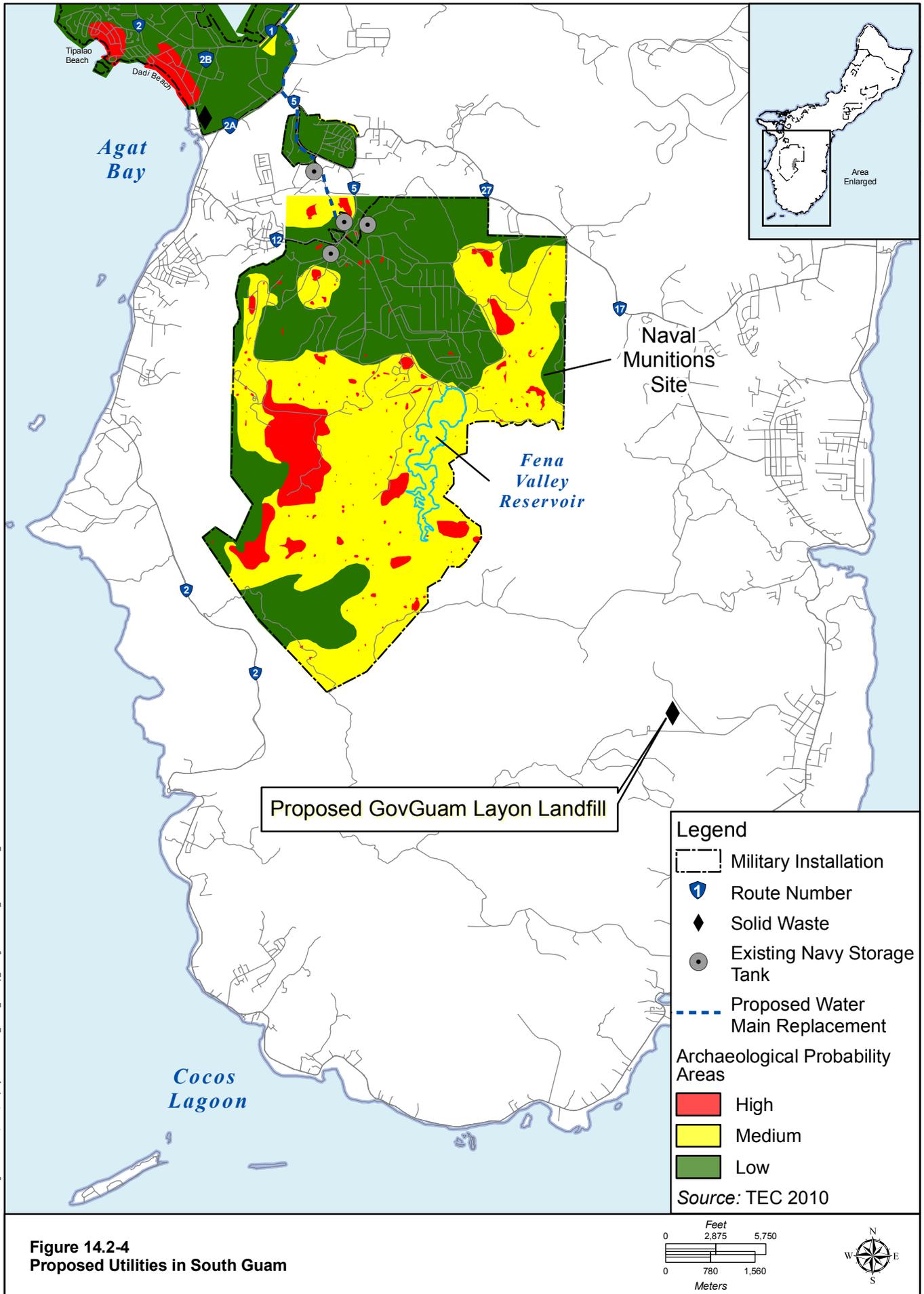


**Figure 14.2-3**  
Proposed Utilities  
in Central Guam

- Legend**
- Military Installation
  - Route Number
  - Power Facility
- Water**
- Proposed Navy Well
  - Existing Storage Tank #4
  - Existing Navy Storage Tank
  - Proposed Navy Ground Level Storage Tank
  - Proposed Navy Elevated Storage Tank
  - Navy Island Wide System Station
  - Proposed Water Main Replacement
  - Proposed Basic Alternative 2 Water
- Wastewater**
- Existing Wastewater
  - Proposed Wastewater
  - Sewage Pump Station
  - Proposed WWTP
- Archaeological Probability Areas**
- High
  - Medium
  - Low

Source: TEC 2010





**Figure 14.2-4**  
**Proposed Utilities in South Guam**

DoD recognizes that mitigation associated with data recovery efforts for archaeological sites impacted by the undertaking would result in increased archaeological materials that need to be curated. This increase in archaeological materials will require appropriate curatorial facilities as well as clearly defined procedures for the disposition of artifacts and, if encountered, the respectful and proper handling of human remains. DoD is committed to working with local, state, and federal partners to maintain DoD archeological material collections on CNMI in facilities that meet federal standards and have appropriate capacity. Further, DoD is committed to ensuring the proper handling and disposition of human remains in accordance with federal statutes. For non-DoD archaeological material collections, DoD would follow local regulations regarding the handling and repatriation of cultural materials or human remains to the extent such local regulations are consistent with federal law and regulations on the subject. DoD is currently working on a capacity analysis of its current collections in Guam and CNMI and will use that information to develop a plan for the initial and long-term curation needs associated with the undertaking.

One site, 08-1350 (a water catchment site of the early American period), is very near a proposed powerline. This site would be marked and avoided during construction. With the BMPs implemented above, no further mitigated measures would be required.

Summary of Impacts

Table 14.2-1 summarizes the potential impacts of the basic alternative.

**Table 14.2-1. Summary of Potential Impacts on Cultural Resources – Power**

<i>Basic Alternative 1*</i>
Construction Impacts (direct with indirect in parentheses)
Archaeological Resources
SI-M <ul style="list-style-type: none"> <li>• Adverse impacts to two archaeological sites, T-U-4, and T-U-11(Adverse impacts to archaeological sites from erosion or construction personnel during the construction process). Possible impacts to site 08-1350 during construction.</li> </ul>
Architectural Resources
NI <ul style="list-style-type: none"> <li>• No adverse impacts to architectural resources at North, South, or Central Guam (no adverse impacts).</li> </ul>
Submerged Resources
NI <ul style="list-style-type: none"> <li>• No adverse impacts to submerged resources or objects (no adverse impacts).</li> </ul>
Traditional Cultural Properties
NI <ul style="list-style-type: none"> <li>• No adverse impacts to Traditional Cultural Properties (no adverse impacts).</li> </ul>
Operation Impacts (direct and indirect are the same)
Archaeological Resources
NI <ul style="list-style-type: none"> <li>• No adverse impacts to archaeological sites at North, South, or Central Guam.</li> </ul>
Architectural Resources
NI <ul style="list-style-type: none"> <li>• No adverse impacts to architectural resources at North, South, or Central Guam.</li> </ul>
Submerged Resources
NI <ul style="list-style-type: none"> <li>• No adverse impacts to submerged resources or objects.</li> </ul>
Traditional Cultural Properties
NI <ul style="list-style-type: none"> <li>• No adverse impacts to Traditional Cultural Properties.</li> </ul>

Legend: NI = No impact; SI-M = Significant impact mitigable to less than significant. \*Preferred Alternative.

### 14.2.3 Potable Water

#### 14.2.3.1 Basic Alternative 1 (Preferred Alternative)

Basic Alternative 1 would provide additional water capacity of 11.3 MGd (42.8 MLd), which is anticipated to be met by an estimated 22 new wells at Andersen Air Force Base (AFB), rehabilitate existing wells, interconnect with the Guam Waterworks Authority (GWA) water system, and associated treatment, storage and distribution systems. Two new 2.5 MG (9.5 ML) water storage tanks would be constructed at ground level at NCTS Finegayan. Up to two new elevated 1 MG (3.8 ML) water storage tanks would be constructed at Finegayan within the Main Cantonment footprint. The elevated tanks would be in different locations depending upon the Main Cantonment alternative.

Impacts to the areas include subgrade construction, cut and fill activities, and brush clearing. No structures would be modified or demolished for this action.

Figure 14.2-2 shows the proposed project locations at Andersen AFB. All of the APE on Andersen AFB were surveyed for archaeological resources (Dixon et al. 2010). Two well locations would cause significant direct adverse impacts to two historic properties T-W-4 (WWII *lancho*) and T-W-7 (a pre-contact ceramic scatter). These sites could also be indirectly affected by erosion or construction personnel working in the area during the construction process. There are many new water storage components in Alternative 1. These components include installing two treated water transmission mains (including a connection to the GWA system), constructing a network of water distribution pipes on both DoD and non-DoD lands, one ground level water storage tank at Finegayan, and two elevated water storage tanks at Finegayan). Impacts to the areas include tree removal, cut and fill activities, and subgrade construction.

Figure 14.2-2 and Figure 14.2-3 show the proposed project locations in relation to archaeological probability areas on Andersen AFB and Finegayan. Waterline construction at Andersen AFB has the potential to cause significant direct adverse impacts to one historic property, T-U-8 (WWII artifact scatter). This site could also be indirectly affected by erosion or construction personnel working in the area during the construction process. All water distribution elements on non-DoD land are replacements of existing lines and are therefore already disturbed and assumed not to contain intact historic properties. Construction at Finegayan has the potential to require the removal of natural resources of cultural concern. A water main that runs along the northern boundary of Andersen South would be replaced. The water main along the eastern border would also be replaced. A traditional cultural property (Latte Stone Park, Site 08-0414) is located approximately 0.5 mile (0.8 kilometer) away in South Finegayan and would not be impacted by construction of the new water distribution pipes.

No direct or indirect impacts from operations of the new water supply and water storage facilities are expected.

BMPs implemented to protect cultural resources include:

- Archaeologists would monitor medium archaeological probability areas during construction in consultation with the SHPO.
- For post review discoveries, an assessment would be made for NRHP eligibility in consultation with the SHPO.
- For areas or properties that have not been inventoried for historic properties, the DoD would follow SOPs as outlined in the ICRMP and any existing agreements.

### Possible Proposed Mitigation Measures

Basic Alternative 1 would have significant adverse impacts on three historic properties (T-W-4, T-W-7, and T-U-8). Mitigation of impacts on the three NRHP-eligible sites would be resolved through data recovery because these sites are eligible under Criterion D and recovery efforts would follow the ACHP guidance, Resolving Adverse Effects through Recovery of Significant Information from Archeological Sites (ACHP 1999). Through data recovery these impacts would be reduced to a less than significant levels. A table with the area, site number, impact, NRHP criteria of significance, and potential mitigation measures for each resource is included in Volume 9, Appendix G.

With the BMPs implemented above, no further mitigation measures would be required.

#### 14.2.3.2 Basic Alternative 2

Basic Alternative 2 would provide additional water capacity of 11.7 MGd (44.3 MLd), which is anticipated to be met by an estimated 20 new wells at Andersen Air Force Base (AFB) and 11 new wells at Air Force Base Barrigada, rehabilitate existing wells, interconnect with the Guam Waterworks Authority (GWA) water system, and associated treatment, storage and distribution systems. Two new 1.8 MG (6.8 ML) water storage tanks would be constructed at ground level at NCTS Finegayan and one 1 MG (3.8 ML) water storage tank would be construction at Air Force Base Barrigada. Up to two new elevated 1 MG (3.8 ML) water storage tanks would be constructed at Finegayan within the Main Cantonment footprint. The tanks would be in different locations that would depend on the Main Cantonment Alternative. All of the APE on Finegayan, Air Force Barrigada, and Andersen AFB have been surveyed for archaeological resources (Dixon et al. 2010).

Figure 14.2-2 shows the proposed project locations at Andersen AFB. Two well locations would cause significant direct adverse impacts on two historic properties that are archaeological sites, T-W-4 and T-W-7. These sites could also be indirectly affected by erosion or construction personnel working in the area during the construction process.

Figure 14.2-2 and Figure 14.2-3 show the proposed project locations on Andersen AFB, Finegayan, and Barrigada. Waterline construction at Andersen AFB has the potential to cause significant direct adverse impacts ton one NRHP-eligible archaeological site, T-U-8. This site could also be indirectly affected by erosion or construction personnel working in the area during the construction process. All water distribution elements on non-DoD land are replacements of existing lines and are therefore already disturbed and assumed not to contain intact historic properties. Construction at Finegayan has the potential to require the removal of natural resources of cultural concern, an impact under NEPA. The new storage tank at Air Force Barrigada would have no impact on cultural resources. Likewise the new wells at Navy Barrigada would have no impact on cultural resources.

No direct or indirect impacts from operations of the new water supply and water storage facilities are expected.

BMPs implemented to protect cultural resources would be the same as those described above.

### Proposed Mitigation Measures

Basic Alternative 2 would have significant adverse impacts to three historic properties (T-W-4, T-W-7, and T-U-8). Mitigation of impacts for the three NRHP-eligible sites would be resolved through data recovery because these sites are eligible under Criterion D and recovery efforts would follow the ACHP guidance, Resolving Adverse Effects through Recovery of Significant Information from Archeological Sites (ACHP 1999). Through data recovery these impacts would be reduced to less than significant levels.

A table with the area, site number, impact, NRHP criteria of significance, and potential mitigation measures for each resource is included in Volume 9, Appendix G.

Impacts on natural resources of cultural concern would be avoided if possible as described above. With the BMPs implemented above, no further mitigation measures would be required.

14.2.3.3 Summary of Impacts

Table 14.2-2 summarizes the potential impacts of each action alternative.

Construction and operation of Basic Alternative 1 would result in significant impacts to three historical properties. However, these impacts are mitigable to less than significant through data recovery. This alternative would not affect historic properties that are architectural resources, or submerged resources. Mitigation would include avoidance, survey, monitoring during construction, evaluation, and data recovery.

**Table 14.2-2. Summary of Potential Impacts on Cultural Resources – Potable Water**

<i>Basic Alternative 1*</i>	<i>Basic Alternative 2</i>
Construction (direct impacts with indirect impacts in parentheses)	
Archaeological Resources	
SI-M <ul style="list-style-type: none"> <li>Adverse impacts to three historic properties at Andersen AFB (impacts to three archaeological sites at Andersen AFB from erosion or construction personnel during the construction process)</li> </ul>	SI-M <ul style="list-style-type: none"> <li>Adverse impacts to three historic properties at Andersen AFB (impacts to three archaeological sites at Andersen AFB from erosion or construction personnel during the construction process)</li> </ul>
Architectural Resources	
NI <ul style="list-style-type: none"> <li>No adverse impacts to architectural resources at North, South, or Central Guam (no adverse impacts)</li> </ul>	NI <ul style="list-style-type: none"> <li>No adverse impacts to architectural resources at North, South, or Central Guam (no adverse impacts)</li> </ul>
Submerged Resources	
NI <ul style="list-style-type: none"> <li>No adverse impacts to submerged resources or objects (no adverse impacts)</li> </ul>	NI <ul style="list-style-type: none"> <li>No adverse impacts to submerged resources or objects (no adverse impacts)</li> </ul>
Traditional Cultural Properties	
NI <ul style="list-style-type: none"> <li>No adverse impacts (no adverse impacts)</li> </ul>	NI <ul style="list-style-type: none"> <li>No adverse impacts (no adverse impacts)</li> </ul>
Operation (direct impacts with indirect impacts in parentheses)	
Archaeological Resources	
NI/SI-M <ul style="list-style-type: none"> <li>No adverse impacts</li> </ul>	NI/SI-M <ul style="list-style-type: none"> <li>No adverse impacts</li> </ul>
Architectural Resources	
NI <ul style="list-style-type: none"> <li>No adverse impacts to architectural resources at North, South, or Central Guam (no adverse impacts)</li> </ul>	NI <ul style="list-style-type: none"> <li>No adverse impacts to architectural resources at North, South, or Central Guam (no adverse impacts)</li> </ul>
Submerged Resources	
NI <ul style="list-style-type: none"> <li>No adverse impacts to submerged resources or objects (no adverse impacts)</li> </ul>	NI <ul style="list-style-type: none"> <li>No adverse impacts to submerged resources or objects (no adverse impacts)</li> </ul>
Traditional Cultural Properties	
NI <ul style="list-style-type: none"> <li>No adverse impacts (no adverse impacts)</li> </ul>	NI <ul style="list-style-type: none"> <li>No adverse impacts (no adverse impacts)</li> </ul>

Legend: AFB = Air Force Base; NI = No impact; SI-M = Significant impact mitigable to less than significant.

\*Preferred Alternative.

Construction and operation of Basic Alternative 2 would result in significant impacts to three historic properties. Construction of new water supply wells and water storage facilities would result in significant impacts to three historic properties. However, these impacts are mitigable to less than significant through data recovery. This alternative would not affect historic properties that are architectural resources or submerged resources. Mitigation would include avoidance, survey, monitoring during construction, evaluation, and data recovery.

#### **14.2.4 Wastewater**

##### **14.2.4.1 Basic Alternative 1a (Preferred Alternative) and 1b**

Basic Alternative 1 (Alternative 1a supports Main Cantonment Alternatives 1 and 2; and Alternative 1b supports Main Cantonment Alternatives 3 and 8) combines upgrade to the existing primary treatment facilities and expansion to secondary treatment at the Northern District Wastewater Treatment Plant (NDWWTP). The difference between Alternatives 1a and 1b would be a requirement for a new sewer line from Barrigada housing to NDWWTP for Alternative 1b. All of the APE at the Main Cantonment and Air Force Barrigada have been surveyed for archaeological resources (Dixon et al. 2010). Approximately 75% of the Harmon Annex and Guam Land Use Plan 77 areas have been surveyed. Unsurveyed areas are designated as medium probability areas.

The construction of the collection system for Wastewater Basic Alternative 1a would take place in areas of medium archaeological sensitivity. Medium archaeological probability areas are located in portions of the Harmon Annex, Guam Land Use Plan 77 areas, and along some roadways. Monitoring during construction would be conducted for these areas. Operations of Basic Alternative 1a would not have significant impacts on cultural resources in the area, as operations would not bring an influx of people into the area and operational activities are unlikely to cause erosion.

BMPs implemented to protect cultural resources include:

- Archaeologists would monitor medium archaeological probability areas during construction in consultation with the SHPO.
- For post review discoveries, an assessment would be made for NRHP eligibility in consultation with the SHPO.
- For areas or properties that have not been inventoried for historic properties, the DoD would follow SOPs as outlined in the ICRMP and any existing agreements.

#### Possible Mitigation Measures

With the BMPs implemented above, no mitigation measures would be required.

##### **14.2.4.2 Basic Alternative 1b**

Under Basic Alternative 1b, the only difference with Basic Alternative 1a would be the additional new sewer and pump stations to convey wastewater from Barrigada to NDWWTP.

Operations of the construction of the collection system for Wastewater Basic Alternative 1b would take place in areas of medium archaeological sensitivity. Medium archaeological probability areas are located in the Harmon Annex, Guam Land Use Plan 77 areas, and along some roadways. Monitoring during construction would be conducted for medium probability areas in accordance with BMPs. Basic Alternative 1b would not have significant impacts on cultural resources in the area, as operations would not bring an influx of people into the area and operational activities are unlikely to cause erosion.

BMPs implemented to protect cultural resources would be the same as those described above.

### Proposed Mitigation Measures

With the BMPs implemented above no mitigation measures would be required.

#### 14.2.4.3 Summary of Impacts

Table 14.2-3 summarizes the potential impacts of each basic alternative. A text summary is provided below.

**Table 14.2-3. Summary of Potential Impacts on Cultural Resources – Wastewater**

<i>Potentially Impacted Resource</i>	<i>Basic Alternative 1a*</i>	<i>Basic Alternative 1b</i>
Construction (direct and indirect impacts are the same)		
Archaeological Resources	NI <ul style="list-style-type: none"> <li>• With use of BMPs, no impact to archaeological resources</li> </ul>	NI <ul style="list-style-type: none"> <li>• With use of BMPs, no impact to archaeological resources</li> </ul>
Architectural Resources	NI <ul style="list-style-type: none"> <li>• No adverse impacts to architectural resources at North, South, or Central Guam</li> </ul>	NI <ul style="list-style-type: none"> <li>• No adverse impacts to architectural resources at North, South, or Central Guam</li> </ul>
Submerged Resources	NI <ul style="list-style-type: none"> <li>• No adverse impacts to submerged resources or objects</li> </ul>	NI <ul style="list-style-type: none"> <li>• No adverse impacts to submerged resources or objects</li> </ul>
Traditional Cultural Properties	NI <ul style="list-style-type: none"> <li>• No adverse impacts to traditional cultural properties</li> </ul>	NI <ul style="list-style-type: none"> <li>• No adverse impacts to traditional cultural properties</li> </ul>
Operation (direct and indirect are the same)		
Archaeological Resources	NI <ul style="list-style-type: none"> <li>• No adverse impacts to archaeological resources at North, South, or Central Guam</li> </ul>	NI <ul style="list-style-type: none"> <li>• No adverse impacts to historic properties at North, South, or Central Guam</li> </ul>
Architectural Resources	NI <ul style="list-style-type: none"> <li>• No adverse impacts to structural resources at North, South, or Central Guam</li> </ul>	NI <ul style="list-style-type: none"> <li>• No adverse impacts to structural resources at North, South, or Central Guam</li> </ul>
Submerged Resources	NI <ul style="list-style-type: none"> <li>• No adverse impacts to submerged resources or objects</li> </ul>	NI <ul style="list-style-type: none"> <li>• No adverse impacts to submerged resources or objects</li> </ul>
Traditional Cultural Properties	NI <ul style="list-style-type: none"> <li>• No adverse impacts to traditional cultural properties</li> </ul>	NI <ul style="list-style-type: none"> <li>• No adverse impacts to traditional cultural properties</li> </ul>

*Legend:* GLUP = Guam Land Use Plan; NI = No impact; SI-M = Significant impact mitigable to less than significant. \*Preferred Alternative.

Construction of Wastewater Basic Alternative 1a would not result in significant impacts to historic properties. Ground disturbance would take place in areas with medium archaeological probability. However, in accordance with BMPs, this area would be monitored during construction. This alternative would not impact architectural resources, traditional cultural properties or submerged resources. Mitigation would include avoidance, survey, monitoring during construction, and data recovery.

Construction of Wastewater Basic Alternative 1b would not result in significant impacts to historic properties. Ground disturbance would take place in areas with medium archaeological probability. However in accordance with BMPs, this area would be monitored during construction. This alternative would not affect architectural resources, traditional cultural properties, or submerged resources.

### 14.2.5 Solid Waste

#### 14.2.5.1 Basic Alternative 1 (Preferred Alternative)

The Preferred Alternative would be to continue to use the Navy Landfill at Apra Harbor for municipal solid waste (MSW) until the new GovGuam Layon Landfill at Dandan is available for use. Disposal of other waste streams excluded from Layon Landfill would continue at the Navy Landfill. Construction and demolition (C&D) debris would continue to be disposed at the Navy landfill. All of the APE have been surveyed for archaeological resources.

Figure 14.2-1 provides the proposed project location in relation to the archaeological probability areas. Overall, this area is considered to be low probability. No archaeological or traditional cultural properties are known from this area. Therefore, no adverse direct or indirect impacts on historic properties would result from implementation of this component (Table 14.2-4).

#### Mitigation Measures

Since the potential in the construction area is low, no mitigation measures or further review under Section 106 are required for archaeology.

**Table 14.2-4. Summary of Potential Impacts on Cultural Resources – Solid Waste**

<i>Potentially Impacted Resource</i>	<i>Basic Alternative 1*</i>
Construction and Operation Impacts (direct and indirect impacts are the same)	
Archaeological Resources	NI <ul style="list-style-type: none"> <li>No adverse impacts to architectural resources at North, South, or Central Guam</li> </ul>
Architectural Resources	NI <ul style="list-style-type: none"> <li>No adverse impacts to architectural resources at North, South, or Central Guam</li> </ul>
Submerged Resources	NI <ul style="list-style-type: none"> <li>No adverse impacts to submerged resources or objects</li> </ul>
Traditional Cultural Properties	NI <ul style="list-style-type: none"> <li>No adverse impacts to traditional cultural properties</li> </ul>

*Legend:* NI = No impact. \*Preferred Alternative.

Since this alternative requires no construction, would use one existing facility, would use one facility that is currently under construction through non-project authorization and independent National Environmental Policy Act review, and would provide only for an increased volume of solid waste, there would be no impacts to cultural resources.

### 14.2.6 Off Base Roadways

Evaluation of the roadways projects' potential to impact historic properties includes a number of sources, in addition to ongoing consultation with Guam SHPO and Section 106 consulting parties. These sources include:

- SHPO's Geographic Information System files of historic property locations on Guam (up-to-date data, requested by FHWA, for greatest accuracy);
- Soil Survey of the Territory of Guam in 1988 by the United States Department of Agriculture;
- The research design and work plan for archaeological survey, testing, and monitoring developed for these projects;

- Project-level evaluations of possible historic architecture and traditional cultural properties;
- Existing literature regarding archaeology, history, ethnography and ethnohistory of the island; and
- Two field visits with Guam SHPO staff.

#### 14.2.6.1 Alternative 1

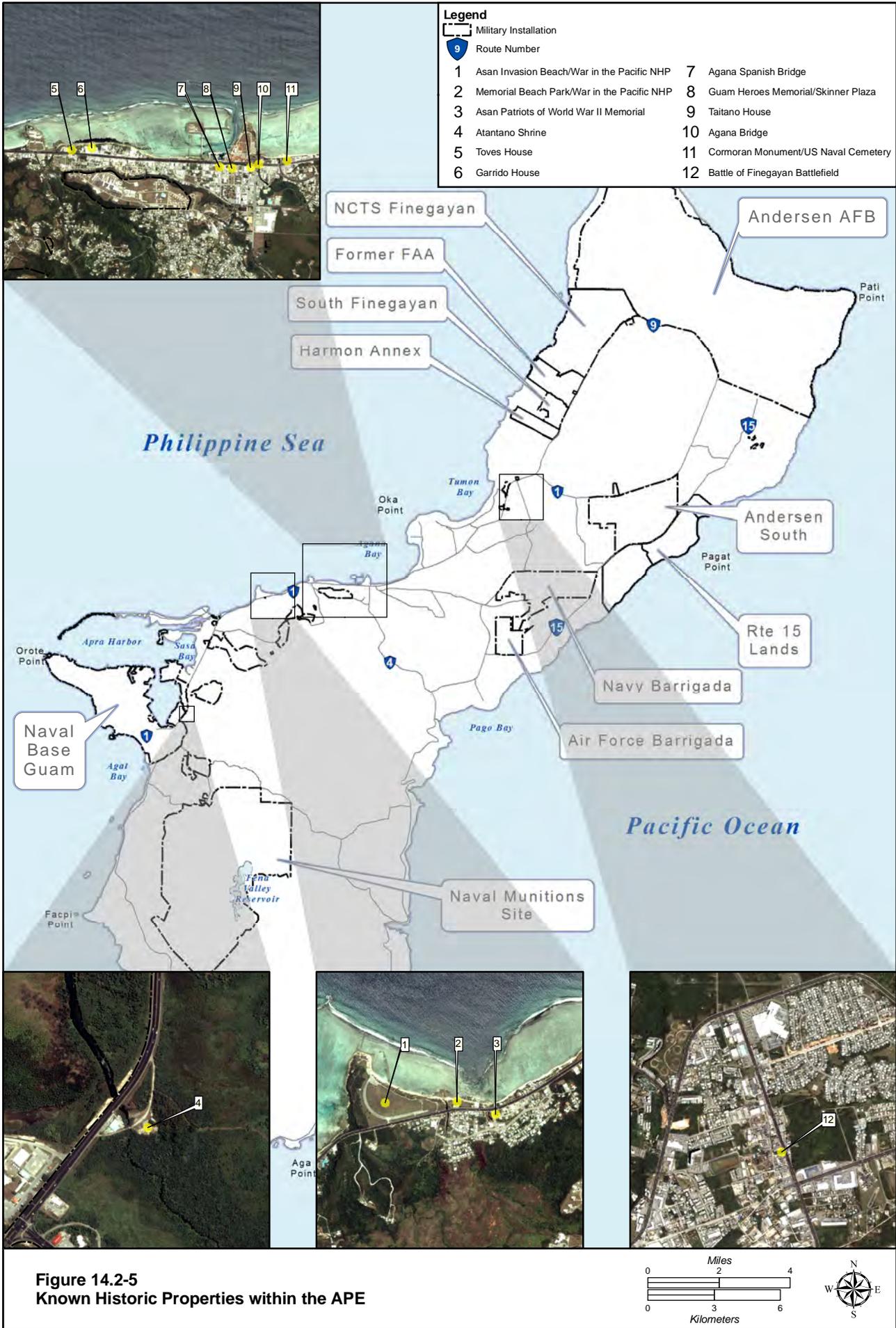
##### North

Numerous archaeological surveys have been completed at military facilities in the North Region, many of which include haul-road corridors. These are summarized in Yee and Tomonari-Tuggle (2009:34). They include Naval Computer and Telecommunications Station Finegayan and South Finegayan along Route 3, Potts Junction (intersection of Routes 3 and 9), and at Andersen South between Routes 1 and 15. Tomonari-Tuggle and Tuggle (2003) present an ICRMP for Andersen AFB that includes summary information and management recommendations for areas of the installation along Routes 3A and 9. Recent, more focused studies and overview surveys for Andersen AFB include survey along a lengthy portion of Route 9. Alternative 1 includes 13 road improvement projects in the North Region.

No known historic properties are within the APE for any roadway project in the North Region (Figure 14.2-5). Table 14.2-5 summarizes Section 106 findings. Some projects are located in areas that may have potential to affect undocumented historic properties. Ongoing consultation is contributing to development of a plan to test and monitor areas where FHWA has found No Adverse Effect to historic properties.

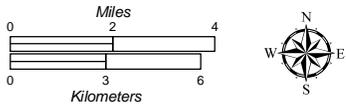
**Table 14.2-5. Section 106 Effects in the North Region, Alternative 1**

<i>GRN #</i>	<i>Known Historic Properties</i>	<i>Section 106 Finding</i>
08	None	No Historic Properties Affected
09	None	No Adverse Effect
10	None	No Adverse Effect
22	None	No Adverse Effect
22A	None	No Adverse Effect
23	None	No Historic Properties Affected
38A	None	No Adverse Effect
39A	None	No Adverse Effect
41A	None	No Adverse Effect
42	None	No Adverse Effect
57	None	No Adverse Effect
117	None	No Historic Properties Affected
124	None	No Adverse Effect



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**Figure 14.2-5  
Known Historic Properties within the APE**



## Central

Recent archaeological research in the Central Region has included investigations for non-military and military purposes. Yee and Tomonari-Tuggle (2009:38-40) detail these efforts. Briefly, there have been several projects within the heavily developed area of downtown Agana particularly along Route 1. Archeological data recovery excavations and monitoring has been conducted along Marine Drive from Route 8 to Camp Watkins Road in connection with Route 1 reconstruction. Most of the cultural deposits were found in the Apurguan area near the east end of Agana Bay, but one site was located in the Agana area. Most of the archaeological work in the Agana area found evidence of historic period occupation.

Alternative 1 includes 27 road improvement projects in the Central Region. Section 106 findings are summarized in Table 14.2-6. Figure 14.2-5 plots known historic properties in relation to road projects. GRN# 1, 3, 13, 14, 15 and 18 have known historic properties in their APE. Most projects would not have an effect on historic properties. Ongoing consultation is contributing to development of a plan to test and monitor areas where FHWA has found No Adverse Effect to historic properties. Each project with properties within its APE is discussed below.

GRN # 1 is a pavement strengthening project past the Cormoran Monument and U.S. Naval Cemetery. Although the proposed improvements do not extend beyond the existing roadway, the geographic information system right-of-way parcel line appears to indicate that the existing roadway is built partially inside the cemetery right-of-way. Since the publication of the Draft EIS, design refinements have avoided these impacts entirely. Thus, GRN#1 would have no effect on these historic properties.

GRN # 3 would replace the Hagatna (Agana) Bridge, which would constitute an Adverse Effect. However, it is likely that the bridge has lost its integrity and associations with its historic past through at least two widenings. Moreover, the Guam SHPO has indicated that the parapets along the bridge are the only contributing historic elements worth preserving. A Memorandum of Agreement is currently being developed to mitigate adverse effects. Stipulations would include providing new parapets in the style of the existing parapets to preserve the look and feel of the historic bridge. Historic American Engineering Record documentation and archival-quality photos would also be completed. Because the project would reconstruct the bridge in its historic location, and mitigation would preserve the only remaining historic attributes and features contributing to the bridge's NRHP eligibility, FHWA finds that, with mitigation, the project would have No Adverse Effect on Hagatna (Agana) Bridge.

GRN # 13 is a pavement strengthening project along Route 1 from Route 11 to the Asan River, with no widening or impacts outside the roadway prism. An archaeological site, Memorial Beach Park, and Asan Invasion Beach are all adjacent to Route 1 in this segment. Because the project would not extend outside of the existing roadway, the project would have no effect on these historic properties.

GRN # 14 is a pavement strengthening project along Route 1 from the Asan River to Route 6, with no widening or impacts outside the roadway prism. Two archaeological sites, the Nino Perdido Church and the Asan World War II Memorial, are adjacent to Route 1 in this segment. Because the project would not extend outside of the existing roadway, the project would have no effect on these historic properties.

GRN # 15 is a pavement strengthening project along Route 1 from Route 6 to Route 4, with no widening or impacts outside the roadway prism. Toves House, Agana Spanish Bridge (San Antonio Bridge), San Nicholas Bridge, and the Guam Heroes Memorial, are all adjacent to Route 1 in this segment. Because the project would not extend outside of the existing roadway, the project would have no effect on these historic properties.

GRN # 16 crosses portions of the Hagatna (Agana) Historic District walking tour/path. Although the project includes widening Route 8, no individual historic properties would be affected. Therefore, the project would have no effect on historic properties.

GRN # 18 is a pavement strengthening project that extends toward the Battle of Finegayan Battlefield. The precise boundaries of the battlefield are uncertain but likely extend into the APE. The site is not currently listed on the NRHP or GRHP, but Guam SHPO staff indicated it is eligible during a February 23, 2010, field visit. Because the project would not leave the existing roadway, the project would have no effect on this historic property.

**Table 14.2-6. Section 106 Effects Central Area, Alternative 1**

<i>GRN #</i>	<i>Known Historic Properties</i>	<i>Section 106 Finding</i>
01	Cormoran Monument, U.S. Naval Cemetery	No Historic Properties Affected
02	None	No Historic Properties Affected
03	Hagatna (Agana) Bridge	No Adverse Effect (mitigated)
06	None	No Historic Properties Affected
07	None	No Historic Properties Affected
11	None	No Historic Properties Affected
12	None	No Adverse Effect
13	Asan Invasion Beach, Memorial Beach Park, War in the Pacific National Historical Park, one archaeological site	No Adverse Effect
14	Asan World War II Memorial, Nino Perdido Church, two archaeological sites	No Adverse Effect
15	San Nicholas Bridge, Agana Spanish Bridge, Guam Heroes Memorial and Skinner Plaza, Taitano House, Garrido House, Toves House	No Adverse Effect
16	None	No Historic Properties Affected
17	None	No Historic Properties Affected
18	Battle of Finegayan Battlefield	No Historic Properties Affected
19	None	No Historic Properties Affected
20	None	No Historic Properties Affected
21	None	No Historic Properties Affected
28	None	No Adverse Effect
29	None	No Adverse Effect
30	None	No Historic Properties Affected
31	None	No Historic Properties Affected
32	Route 1 Reconstruction Site	No Historic Properties Affected
33	None	No Historic Properties Affected
35	None	No Adverse Effect
36	One archaeological site	Adverse Effect
44	None	No Adverse Effect
46	None	No Adverse Effect
113	Mesa House	No Historic Properties Affected

GRN # 36 proposes to re-align Route 15 on to DoD land inland from its current location. This area has been subject to pedestrian inventory. One archaeological site is located within the APE. The proposed re-alignment would cut through the site. Therefore, the project would have an Adverse Effect on the archaeological site. A Memorandum of Agreement is currently being developed to mitigate adverse effects.

GRN #113 is a striping and signing project with minor intersection improvements along Route 7 and 7A. Mesa House is located in or near the APE for this project, but is set far enough away from the roadway that no effects would result.

#### Apra Harbor

Extensive archaeological overviews and surveys have been undertaken in and around Apra Harbor. Five surveys have been completed in the Route 1/2A/5 area. The Route 1 and 2A corridors inland of Apra Harbor have been identified in previous archaeological and paleoenvironmental surveys as the locales of early Pre-Latte Period sites. Yee and Tomonari-Tuggle (2009:43) present a summary of previous investigations.

Alternative 1 includes five road improvement projects in the Apra Harbor Region. Effects on known historic properties are summarized in Table 14.2-7. Figure 14.2-5 plots known historic properties in relation to road projects. The Atantano Shrine is located within a parcel adjacent to GRN #24, but it is located well away from the roadway and would not be affected by the project. Ongoing consultation is contributing to development of a plan to test and monitor areas where FHWA has found No Adverse Effect to historic properties.

**Table 14.2-7. Section 106 Effects in the Apra Harbor Region from Alternative 1**

<i>GRN #</i>	<i>Known Historic Properties</i>	<i>Section 106 Finding</i>
04	None	No Adverse Effect
05	None	No Adverse Effect
24	Atantano Shrine	No Historic Properties Affected for the Shrine; No Adverse Effect elsewhere
26	None	No Historic Properties Affected
50	None	No Adverse Effect

#### South

Alternative 1 includes four road improvement projects in the South region. There are no known historic properties within the APE of any project in the South region. Table 14.2-8 summarizes Section 106 findings in the South region. Ongoing consultation is contributing to development of a plan to test and monitor areas where FHWA has found No Adverse Effect to historic properties.

**Table 14.2-8. Section 106 Effects on Known Historic Properties in the South Region from Alternative 1**

<i>GRN #</i>	<i>Known Historic Properties</i>	<i>Section 106 Finding</i>
25	None	No Historic Properties Affected
27	None	No Adverse Effect
52	None	No Adverse Effect
110	None	No Historic Properties Affected

### Indirect Effects

Adverse indirect effects are unlikely to result from off base roadway projects. Most projects are along existing transportation corridors, where existing noise, visual impacts, and other elements are common to adjacent historic properties. Moreover, for all projects, any such impacts identified as adverse would be mitigated through sound walls or other appropriate measures, reducing potential indirect impacts below any adverse level. The potential for indirect impacts caused by increases in traffic and visitation, which may result from the roadway projects within Andersen South and South Finegayan are discussed in Volume 2, Chapter 12. There is little potential for such indirect impacts for remaining projects, because all are located on existing transportation corridors.

### Proposed Mitigation Measures

Alternative 1 would create adverse effects to the Hagatna (Agana) Bridge and an archaeological site. Mitigation for impacts to the bridge would preserve its historic setting and appearance and could include Historic American Engineering Record documentation and photo recordation. Mitigation for the archaeological site would include data recovery.

#### 14.2.6.2 Alternative 2 (Preferred Alternative)

Peak construction and permanent impacts on cultural resources under Alternative 2 would be similar to those described under Alternative 1 because the same projects, except for varying locations of the Military Access Points at Naval Computer and Telecommunications Station Finegayan, are proposed under this alternative. Proposed mitigation measures for Alternative 2 would be the same as those proposed for Alternative 1.

#### 14.2.6.3 Alternative 3

Peak construction and permanent impacts on cultural resources under Alternative 3 would be similar to those described under Alternative 1 because the same projects are proposed under this alternative with a few projects more or less than Alternative 1 that would be built as part of the GRN improvements program. Proposed mitigation measures for Alternative 3 would be the same as those proposed for Alternative 1.

#### 14.2.6.4 Alternative 8

Peak construction and permanent impacts on cultural resources under Alternative 8 would be similar to those described under Alternative 1 because the same projects are proposed under this alternative with a few projects more or less than Alternative 1 that would be built as part of the GRN improvements program. Proposed mitigation measures for Alternative 8 would be the same as those proposed for Alternative 1.

#### 14.2.6.5 Summary of Impacts

Table 14.2-9 summarizes the potential impacts of each alternative.

**Table 14.2-9. Summary of Potential Impacts on Cultural Resources – Roadway Project**

<i>Potentially Impacted Resource</i>	<i>Alternative 1</i>	<i>Alternative 2*</i>	<i>Alternative 3</i>	<i>Alternative 8</i>
Cultural Resources	SI-M	SI-M	SI-M	SI-M

*Legend:* SI-M = Significant impact mitigable to less than significant. \*Preferred Alternative.

## 14.2.6.6 Summary of Proposed Mitigation Measures

Table 14.2-10 summarizes the proposed mitigation measures for roadway projects impacts on cultural resources.

**Table 14.2-10. Summary of Proposed Mitigation Measures for Roadway Projects Impacts on Cultural Resources**

<i>Phase</i>	<i>Mitigation Measure</i>
Construction	<ul style="list-style-type: none"><li>• Site monitoring</li><li>• Data recovery</li></ul>
Operation	<ul style="list-style-type: none"><li>• Preservation of historic setting and appearance</li></ul>

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