The GCMP Assessment Format and Supplemental Information Form may be reproduced and submitted along with other required information to the BSP.

# GUAM COASTAL MANAGEMENT PROGRAM ASSESSMENT FORMAT

DATE OF APPLICATION: February 3, 2017
NAME OF APPLICANT: Glenn Leon Guerrero- Director, Guam Department of Public Works
ADDRESS: 542 North Marine Corps Drive, Tamming, Guam 96913
TELEPHONE NO. 671-646-3131 Fax No. 671-649-6178 Cell No: _____
E-MAIL ADDRESS: Glenn.Leonguerrero@dpw.guam.gov

TITLE OF PROPOSED PROJECT:
Ajayan Bridge Replacement Project

**COMPLETE FOLLOWING PAGES**

FOR BUREAU OF STATISTICS AND PLANS ONLY:

DATE APPLICATION RECEIVED: _____
OCRM NOTIFIED: _____ LIC. AGENCY NOTIFIED: _____
APPLICANT NOTIFIED: _____ PUBLIC NOTICE GIVEN: _____
OTHER AGENCY REVIEW
REQUESTED: _____
_____
_____

DETERMINATION:
( ) CONSISTENT ( ) NON-CONSISTENT ( ) FURTHER INFORMATION REQUESTED

OCRM NOTIFIED: _____ LIC. AGENCY NOTIFIED: _____
APPLICANT NOTIFIED: _____
ACTION LOG:
1. _____

2. _____

3. _____

4. _____

5. _____

6. _____

DATE REVIEW COMPLETED: _____

**DEVELOPMENT POLICIES (DP):**

DP 1. Shore Area Development

Intent: To ensure environmental and aesthetic compatibility of shore area land uses.

Policy: Only those uses shall be located within the Seashore Reserve which:
- enhance, are compatible with or do not generally detract from the surrounding coastal area's aesthetic and environmental quality and beach accessibility; or
- can demonstrate dependence on such a location and the lack of feasible alternative sites.

Discussion:

No new shore area development is part of this project. The existing single-span cast-in-place concrete box girder bridge was constructed in 1968 and will be replaced. The proposed improvements include two 12-foot-wide lanes with 8-foot-wide paved shoulders. Roadway alignment and grade will match the existing at the points of tie-in. The project will include demolishing and removing the existing bridge structure and existing pile caps. The existing piles below the waterline will be cut and capped at the mudline but left in-place. This will allow for minimal disturbance of the aquatic ecosystem. Roadway work within the project limits will include removing the existing pavement, replacing full-depth pavement, and replacing the guardrails.

DP 2. Urban Development

Intent: To cluster high impact uses such that coherent community design, function, infrastructure support and environmental compatibility are assured.

Policy: Commercial, multi-family, industrial and resort-hotel zone uses and uses requiring high levels of support facilities shall be concentrated within appropriate zone as outlined on the Guam Zoning Code.

Discussion:

Not applicable. Commercial, multi-family, industrial and resort-hotel zone uses and uses requiring high levels of support facilities are not part of this bridge replacement project.

DP 3. Rural Development

Intent: To provide a development pattern compatible with environmental and infrastructure support suitability and which can permit traditional lifestyle patterns to continue to the extent practicable.

Policy: Rural districts shall be designated in which only low density residential and agricultural uses will be acceptable. Minimum lot size for these uses should be one-half acre until adequate infrastructure including functional sewering is provided.

Discussion:

Not applicable. Rural development is not part of this bridge replacement project.

DP 4. Major Facility Siting

Intent: To include the national interest in analyzing the siting proposals for major utilities, fuel and transport facilities.

Policy: In evaluating the consistency of proposed major facilities with the goals, policies, and standards of the Comprehensive Development and Coastal Management Plans, Guam shall recognize the national interest in the siting of such facilities, including those associated with electric power production and transmission, petroleum refining and transmission, port and air installations, solid waste disposal, sewage treatment, and major reservoir sites.

Discussion:

Not applicable. This project does not involve the siting of facilities for electric power production and transmission, port and air installations, solid waste disposal, sewage treatment, or major reservoir sites.

DP 5. Hazardous Areas

Intent: Development in hazardous areas will be governed by the degree of hazard and the land use regulations.

Policy: Identified hazardous lands, including flood plains, erosion-prone areas, air installations' crash and sound zones and major fault lines shall be developed only to the extent that such development does not pose unreasonable risks to the health, safety or welfare of the people of Guam, and complies with the land use regulations.

Discussion:

According to the Flood Insurance Rate Map (FIRM), the project area is within Zone AE or the 100-year or 1% annual chance of flood. Although this is a Special Flood Hazard Area, the project is not a new development but is instead replacement of an existing bridge. The replacement bridge will not create new or additional development that would pose a risk to the health, safety, or welfare to the people of Guam. The bridge will be designed and constructed in accordance with Public Law 30-159 provisions of the 2009 International Building Code (IBC), in which it is capable of withstanding strong currents and seismic activity.

DP 6. Housing

Intent: To promote efficient community design placed where the resources can support it.

Policy: The government shall encourage efficient design of residential areas, restrict such development in areas highly susceptible to natural and manmade hazards, and recognize the limitations of the island's resources to support historical patterns of residential development.

Discussion:

Not applicable. The project scope is limited to bridge replacement and does not include residential development.

DP 7. Transportation

Intent: To provide transportation systems while protecting potentially impacted resources.

Policy: Guam shall develop an efficient and safe transportation system, while limiting adverse environmental impacts on primary aquifers, beaches, estuaries, coral reefs and other coastal resources.

Discussion:

This bridge replacement project will replace the existing Ajayan Bridge in order to ensure safe and efficient two-lane access between Merizo and Inarajan. To accommodate traffic during construction, the bridge will be demolished in two phases (i.e., demolishing one side [longitudinally] of the bridge at a time). This will allow two-way traffic (one lane, controlled by traffic lights) to use the bridge during demolition and construction. Construction of the new bridge will also be performed in two phases so that two-way signal-controlled traffic can be maintained in one lane during construction. Direct impacts to significant coastal resources, such as living coral, seagrass beds, and Nypa palm community, will be avoided. No in-water work will take place during coral spawning. Marine species access through the river corridor will be maintained. Construction BMPs, such as catchment platforms, protective netting, silt screen fences, and turbidity curtains will be implemented to minimize potential impact to water quality and aquatic resources. See Appendix H – BMPs and Minimization Measures).

DP 8. Erosion and Siltation

Intent: To control development where erosion and siltation damage is likely to occur.

Policy: Development shall be limited in areas of 15% or greater slope by requiring strict compliance with erosion, sedimentation, and land use regulations, as well as other related land use guidelines for such areas.

Discussion:

Construction best management practices (BMPs) will be implemented to minimize potential impacts to surface waters, as described above in DP 7. An Environmental Protection Plan, Erosion Control Plan, Storm Water Pollution Prevention Plan, and project-specific plans will be prepared, approved by appropriate regulatory agencies, and implemented. See Appendix H – BMPs and Minimization Measures for further details.

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**RESOURCES POLICIES (RP):**

RP 1. Air Quality

Intent: To control activities to insure good air quality.

Policy: All activities and uses shall comply with all local air pollution regulations and all appropriate Federal air quality standards in order to ensure the maintenance of Guam's relatively high air quality.

Discussion:

The project will not result in any meaningful changes in traffic volumes, vehicle mix, location of the existing facility, or any other factor that would cause an increase in emissions impacts. As such, FHWA has determined that this project will generate minimal air quality impacts for Clean Air Act criteria pollutants and has not been linked with any special Mobile Source Air Toxics (MSAT) concerns. Consequently, this effort is exempt from analysis for MSATs. Moreover, EPA regulations for vehicle engines and fuels will cause overall MSATs to decline significantly over the next 20 years. Even after accounting for a 64 percent increase in vehicle miles traveled (VMT), FHWA predicts MSATs will decline in the range of 57 percent to 87 percent, from 2000 to 2020, based on regulations now in effect, even with a projected 64 percent increase in VMT. This will both reduce the background level of MSATs, as well as the possibility of even minor MSAT emissions from this project.

RP 2. Water Quality

Intent: To control activities that may degrade Guam's drinking, recreational, and ecologically sensitive waters.

Policy: Safe drinking water shall be assured and aquatic recreation sites shall be protected through the regulation of uses and discharges that pose a pollution threat to Guam's waters, particularly in estuaries, reef and aquifer areas.

Discussion:

This project will not degrade Guam's drinking, recreational, or ecologically sensitive waters. The project site does not overlie Guam's sole source aquifer or any portion of its recharge area, which provides Guam's drinking water. BMPs and storm water and erosion control measures, as described in detail in Appendix H, will be utilized to prevent degradation to Guam's recreational and ecologically sensitive waters. In addition, a National Pollutant Discharge Elimination System (NPDES) permit will be obtained from the Guam EPA. An Army Corps of Engineers, Clean Water Act Section 404, Permit and Rivers and Harbors Act, Section 10 Permit will also be required.

RP 3. Fragile Areas

Intent: To protect significant cultural areas, and natural marine and terrestrial wildlife and plant habitats.

Policy: Development in the following types of fragile areas including Guam's Marine Protected Areas (MPA) shall be regulated to protect their unique character.

- historical and archeological sites
- wildlife habitats
- pristine marine and terrestrial communities
- limestone forests
- mangrove stands and other wetlands
- coral reefs

Discussion:

* Ajayan Bridge is located near the Achang Reef Flat Marine Protected Area (MPA), in which taking, killing, damaging, or wounding marine organisms is prohibited. The FHWA and DPW have coordinated with USFWS, NMFS, and Guam DAWR to develop measures to avoid, mitigate, and/or minimize potential impacts to marine species. See Appendix G – Agency Consultation Correspondence, Appendix J – Marine Protected Species of the Mariana Islands, and Appendix K – Flora and Fauna Surveys for Ajayan Bridge Replacement Project.

* Ajayan Bay Archaeological Site (Site no. 66-05-0111) is in the vicinity of the project. An Archaeological Survey and Subsurface testing was conducted to identify the project's potential impact. The Guam State Historic Preservation Officer concurred with the Federal Highway Administration determination of "no adverse effect" pursuant to the National Historic Preservation Act on July 18, 2016 and September 14, 2016. See Appendix G – Agency Consultation Correspondence.

RP 4. Living Marine Resources

Intent: To protect marine resources in Guam's waters.

Policy: All living resources within the waters of Guam, particularly fish, shall be protected from over harvesting and, in the case of corals, sea turtles and marine mammals, from any taking whatsoever.

Discussion:

DPW and FHWA consulted with NMFS to minimize potential impacts to Essential Fish Habitat (EFH) (see Appendix G – Agency Consultation Correspondence). The EFH conservation recommendation provided by NMFS will be followed. This will include strict adherence and inspection of BMPs, real-time turbidity monitoring and adaptive management to address impacts to water quality, immediate replacement of vegetation following construction, cleaning of equipment to avoid spread of invasive species, and development of a compensatory mitigation plan to offset loss of EFH should BMPs fail to protect EFH. Direct destruction and impacts to living coral, seagrass beds, and Nypa palm community will be avoided. Per Guam DAWR, coral spawning takes place around the last quarter moon of July and August. No in-water work will take place within 3 days of this moon phase to avoid impacting coral spawning. Marine species access through the river corridor will be maintained. Measures to avoid and minimize potential impacts to marine mammals and sea turtles will be implemented. Construction BMPs will be implemented to minimize potential impact to water quality, clarity, and aquatic resources.

RP 5. Visual Quality

Intent: To protect the quality of Guam's natural scenic beauty

Policy: Preservation and enhancement of, and respect for the island's scenic resources shall be encouraged through increased enforcement of and compliance with sign, litter, zoning, subdivision, building and related land-use laws. Visually objectionable uses shall be located to the maximum extent practicable so as not to degrade significant views from scenic overlooks, highways and trails.

Discussion:

No impact is anticipated to the visual quality of the project area or surrounding areas. The existing bridge will be replaced with a new 40-foot-wide by 105-foot-long bridge. The proposed improvements include two 12-foot-wide lanes with 8-foot-wide paved shoulders. Roadway alignment and grade will match the existing at the points of tie-in.

RP6. Recreation Areas

Intent: To encourage environmentally compatible recreational development.

Policy: The Government of Guam shall encourage development of varied types of recreational facilities located and maintained so as to be compatible with the surrounding environment and land uses, adequately serve community centers and urban areas and protect beaches and such passive recreational areas as wildlife, marine conservation and marine protected areas, scenic overlooks, parks, and historical sites.

Developments, activities and uses shall comply with the Guam Recreational Water Use Management Plan (RWUMP).

Discussion:

The bridge replacement project will not impact recreational areas. As discussed above in RP 3, the Ajayan Bridge is located in the Achang Reef Flat MPA. Given that the existing bridge provides a passive scenic view of the MPA through the natural break in the coastal vegetation, the replacement bridge would continue to support the same passive appreciation of the marine protected area.

RP 7. Public Access

Intent: To ensure the right of public access.

Policy: The public's right of unrestricted access shall be ensured to all non-federally owned beach areas and all Guam recreation areas, parks, scenic overlooks, designated conservation areas and their public lands. Agreements shall be encouraged with the owners of private and federal property for the provision of releasable access to and use of resources of public nature located on such land.

Discussion:

Public access will be maintained throughout the project. To accommodate traffic during construction, the bridge will be demolished in two phases (i.e., demolishing one side [longitudinally] of the bridge at a time). This will allow two-way traffic (one lane, controlled by traffic lights) to use the bridge during demolition and construction. Construction of the new bridge will also be performed in two phases so that two-way signal-controlled traffic can be maintained in one lane during construction.

RP 8. Agricultural Lands

Intent: To stop urban types of development on agricultural land.

Policy: Critical agricultural land shall be preserved and maintained for agricultural use.

Discussion:

Not applicable. The bridge replacement project will not remove active critical agricultural land from production.

**FEDERAL CONSISTENCY**
**SUPPLEMENTAL INFORMATION FORM**

Date: January 23, 2017

Project/Activity Title or
Description Ajayan Bridge Replacement Project

Location: Ajayan Bridge, Merizo, Guam

Other applicable area(s) affected, if appropriate:

Est. Start Date: June 2017 Est. Duration: 630 calendar days

**APPLICANT**

Name & Title Glenn Leon Guerrero- Director

Agency/Organization Guam Department of Public Works

Address 542 North Marine Corps Drive, 96913

Tamuning, Guam Zip Code 96913

Telephone No. during business hours:
A/C ( 671 ) 646-3131
A/C ( ___ ) _____
Fax ( 671 ) 649-6178

E-mail Address: Glenn.Leonguerrero@dpw.gov

AGENT
Name & Title Michael Lanning, Program Manager
Agency/Organization Address Parsons Transportation Group, 590 South Marine Corps Drive, Suite 403, Tamuning, GU Zip Code 96913

Telephone No. during business hours:

A/C ( 671 ) 648-1060
A/C ( ___ ) _____
Fax ( 671 ) 646-0678

E-mail Address: Michael.Lanning@parsons.com

**CATEGORY OF APPLICATION** (check one only)

( ) I - Federal Agency Activity
(X) II - Federal Permit or License
( ) III - Federal Grants & Assistance

**TYPE OF STATEMENT** (check one only)

(X) Consistency
( ) General Consistency (Category I only)
( ) Negative Determination (Category I only)
( ) Non-Consistency (Category I only)

**APPROVING FEDERAL AGENCY** (Categories II & III only)

Agency Federal Highways Administration (FHWA)

Contact Person Richelle Takara

Telephone No. during business hours:

Area Code (808) 541-2311
Area Code ( )_____

**FEDERAL AUTHORITY FOR ACTIVITY**

Title of Law Moving Ahead for Progress in the 21st Century Act (MAP-21)
Section 1114 Territorial and Puerto Rico Highway Program

OTHER GUAM APPROVALS REQUIRED:

| Agency | Type of Approval | Date of Application | Status |
|---|---|---|---|
| USACE | Section 404 Permit | January 2017 | In Progress |
| Guam EPA | Section 401 WQC | January 2017 | In Progress |
| FHWA | NEPA-Cat-Ex | September 2016 | Complete |
| SHPO | NHPA Section 106 | September 2016 | Complete |
| Guam BSP | Seashore Clearance Permit | November 2016 | Letter of No Permit |
| Guam EPA | NPDES for Stormwater Assoc. w/ Const. Activities | | Pending |
| Guam EPA | NPDES for Dewatering | | Pending |

# Appendix A
# Project Location Map


**LOCATION MAP**



**LEGEND**

- Ajayan Bridge
- Ajayan River

**NOTES**

1. Base Map: Orthophoto Mosaic 2009.
2. Map projection: World Geodetic System 1984 Universal Transverse Mercator Zone 55N

N

0 250 500 1,000 Feet

**Figure 1**
**Project Location Map**
**Ajayan Bridge Replacement**
**Merizo, Guam**

Path: P:\ENV\Federal\NAVY\CLEAN III\CTO HC31 (60134842)\50 Data\GIS\02 RIFS Report\MXD\Figure 1 - Project Location Map.mxd Date: 10/26/2012

# Appendix B
# Site Photographs

Photo 1 – Cracking demonstrating differential movement of the bridge

Photo 2 – Undermining of south abutment pile cap

Photo 3 – View from the north and east of the Ajayan Bridge

Photo 4 - View from the south east of the Ajayan Bridge

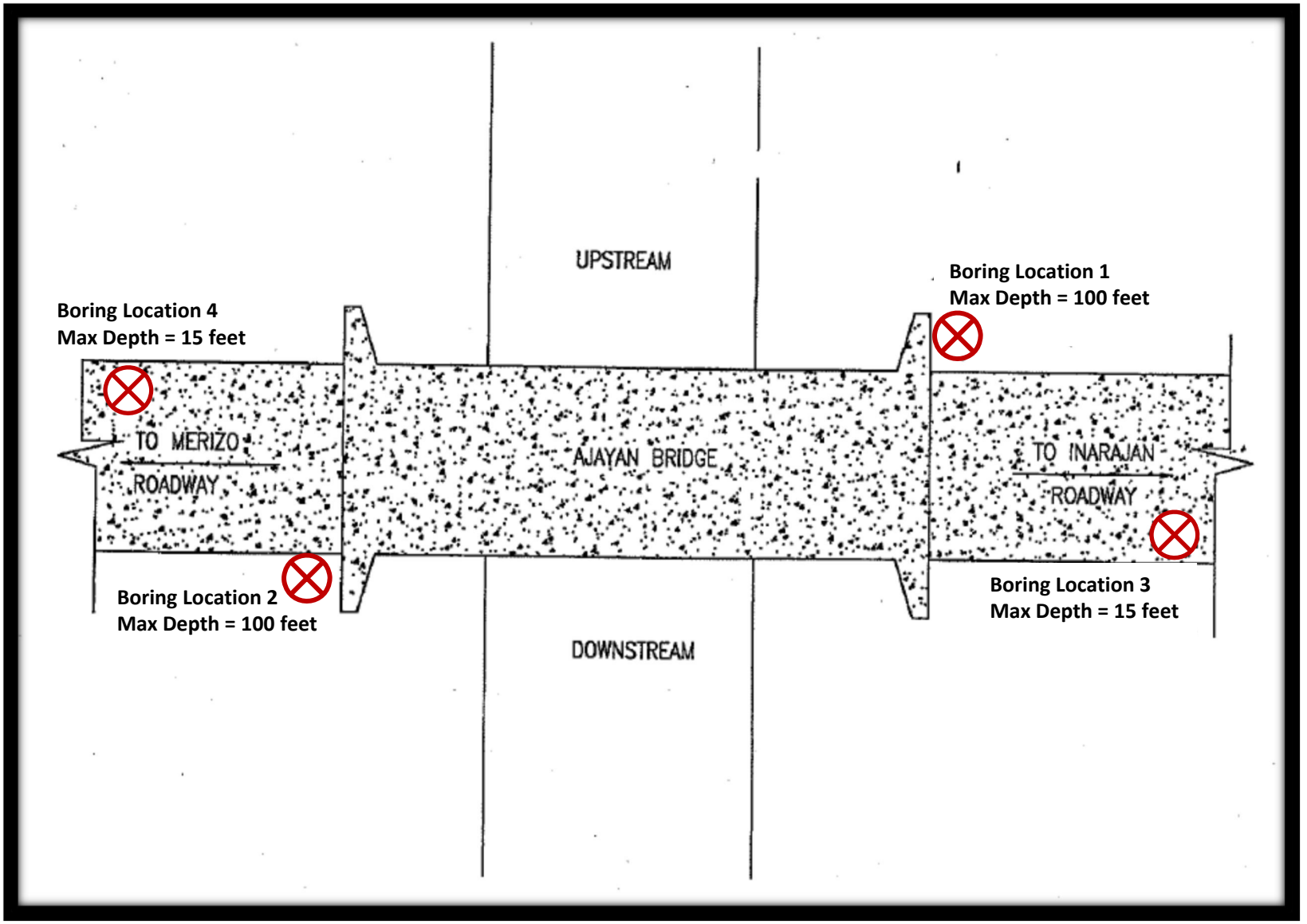
Photo 5 - Vegetation to the south of Route 4

Photo 6 – Vegetation immediately to the south and east of the east Ajayan Bridge abutment

Photo 7 – View from the Ajayan Bridge of the vegetation immediately to the south and east

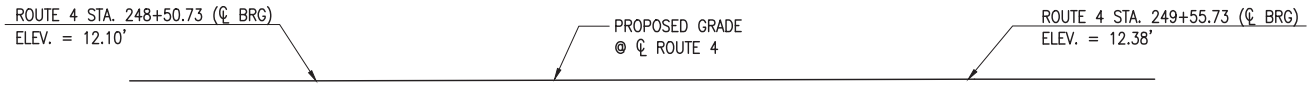
Photo 8 – Vegetation to the North and East of the Ajayan Bridge

# Appendix C
# Geotechnical Soil Boring Locations

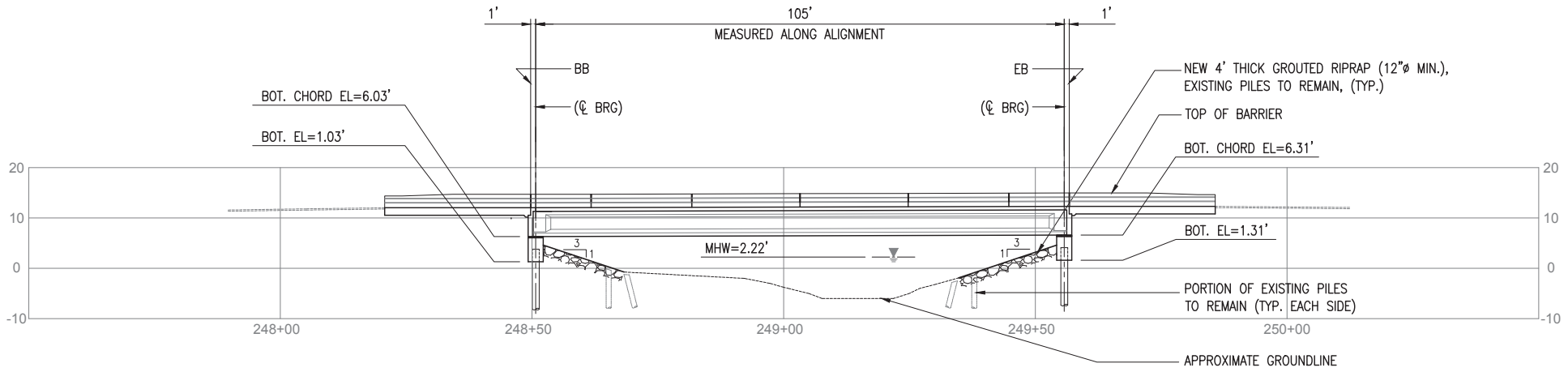



**Geotechnical Soil Boring Locations**

# Appendix D
# Bridge Profile




## PROFILE
SCALE: 1" = 20'




NOTES:
50-YEAR WATER LEVEL=2.7' ABOVE MHHW
100-YEAR WATER LEVEL=12' ABOVE MHHW
AND MHHW IS 0.99' ABOVE MSL

## DEVELOPED ELEVATION
SCALE: 1" = 20'

20' 15' 10' 5' 0 10' 20' 40'
SCALE: 1"=20'

| DRAWING REVISIONS | | | |
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| REVISION | DATE | BY | DESCRIPTION |
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I CERTIFY THAT THIS WORK WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION

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| DESIGNER | NCM/JMC |
| DETAILER | MDC/RSS |
| CHECKER | NCM/AMD/VWAC |
| DATE | JULY 31, 2013 |

N.C. MACARIO & ASSOCIATES, INC.
270 Guerrero Drive Aka Pick-A-Nail Road Tamuning Guam 96913
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Email: ncma@guam.net

AJAYAN BRIDGE REPLACEMENT
MERIZO, GUAM

DEVELOPED ELEVATION & PROFILE

GUAM
DEPARTMENT OF PUBLIC WORKS

| VILLAGE | TERRITORY | PROJECT | DRAWING | SHEET NO. | TOTAL NO. |
|---|---|---|---|---|---|
| MERIZO | GUAM | GQ-ER-0004(114) | S-4 | 38 | 66 |

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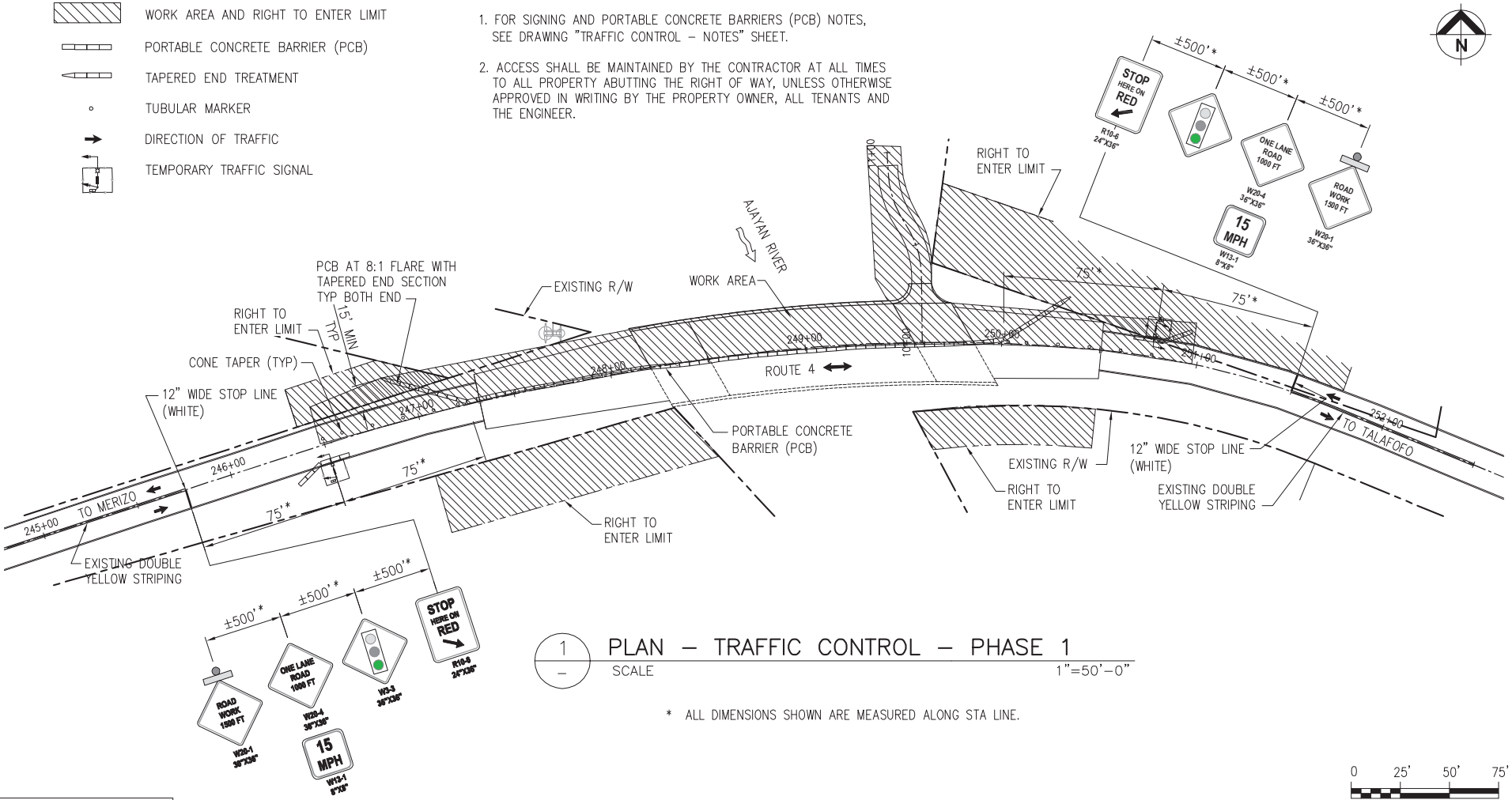
# Appendix E
# Traffic Control Plans

LEGEND:

- WORK AREA AND RIGHT TO ENTER LIMIT
- PORTABLE CONCRETE BARRIER (PCB)
- TAPERED END TREATMENT
- TUBULAR MARKER
- DIRECTION OF TRAFFIC
- TEMPORARY TRAFFIC SIGNAL

NOTE:

1. FOR SIGNING AND PORTABLE CONCRETE BARRIERS (PCB) NOTES, SEE DRAWING "TRAFFIC CONTROL – NOTES" SHEET.
2. ACCESS SHALL BE MAINTAINED BY THE CONTRACTOR AT ALL TIMES TO ALL PROPERTY ABUTTING THE RIGHT OF WAY, UNLESS OTHERWISE APPROVED IN WRITING BY THE PROPERTY OWNER, ALL TENANTS AND THE ENGINEER.




1 – PLAN – TRAFFIC CONTROL – PHASE 1

SCALE 1"=50'–0"

* ALL DIMENSIONS SHOWN ARE MEASURED ALONG STA LINE.

0 25' 50' 75'

1"=50'–0"


AECOM
414 W. Soledad Avenue Ste 708
Hagatna, Guam 96910
(671) 488–8325


DRAWING REVISIONS

| REVISION | DATE | BY | DESCRIPTION |
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| DESIGNER | E. HIPOLITO |
| DETAILER | E. LANDAS |
| CHECKER | E. HIPOLITO |
| DATE | JULY 31, 2013 |


N.C. MACARIO & ASSOCIATES, INC.
270 Guerrero Drive Aka Pick-A-Nail Road Tamuning Guam 96913
Tel. 646-0947/48 Fax: 646-0901
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AJAYAN BRIDGE REPLACEMENT
MERIZO, GUAM

TRAFFIC CONTROL - PHASE 1

GUAM
DEPARTMENT OF PUBLIC WORKS

| VILLAGE | TERRITORY | PROJECT | DRAWING | SHEET NO. | TOTAL NO. |
|---|---|---|---|---|---|
| MERIZO | GUAM | GQ–ER–0004(114) | TC–2 | 20 | 66 |

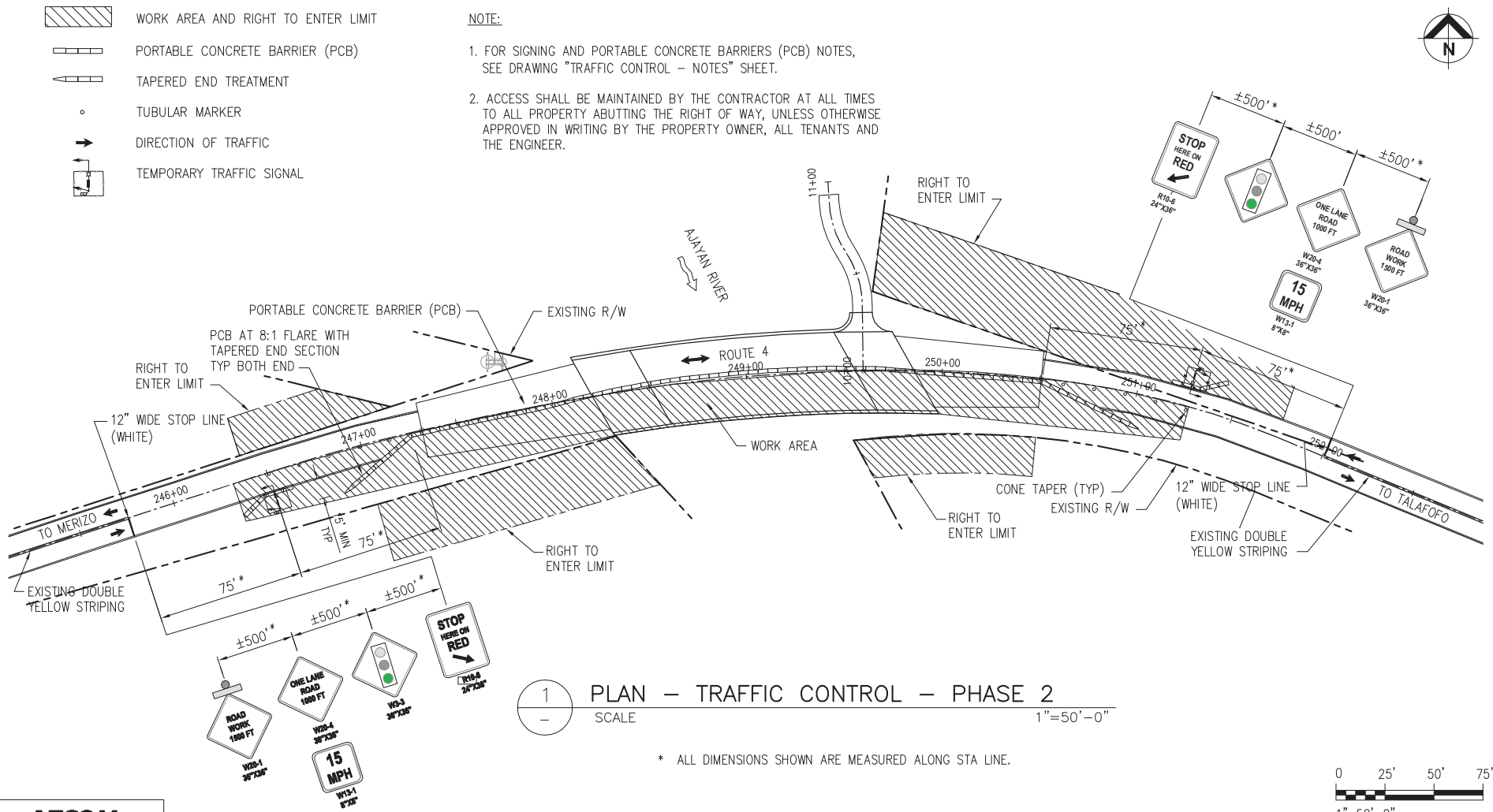
100% SUBMITTAL

LEGEND:

- WORK AREA AND RIGHT TO ENTER LIMIT
- PORTABLE CONCRETE BARRIER (PCB)
- TAPERED END TREATMENT
- TUBULAR MARKER
- DIRECTION OF TRAFFIC
- TEMPORARY TRAFFIC SIGNAL

NOTE:

1. FOR SIGNING AND PORTABLE CONCRETE BARRIERS (PCB) NOTES, SEE DRAWING "TRAFFIC CONTROL – NOTES" SHEET.
2. ACCESS SHALL BE MAINTAINED BY THE CONTRACTOR AT ALL TIMES TO ALL PROPERTY ABUTTING THE RIGHT OF WAY, UNLESS OTHERWISE APPROVED IN WRITING BY THE PROPERTY OWNER, ALL TENANTS AND THE ENGINEER.




1 — PLAN – TRAFFIC CONTROL – PHASE 2

SCALE 1"=50'–0"

* ALL DIMENSIONS SHOWN ARE MEASURED ALONG STA LINE.

0 25' 50' 75'

1"=50'–0"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Hagatna, Guam 96910
(671) 488-8325


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| DESIGNER | E. HIPOLITO |
| DETAILER | E. LANDAS |
| CHECKER | E. HIPOLITO |
| DATE | JULY 31, 2013 |


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AJAYAN BRIDGE REPLACEMENT
MERIZO, GUAM

TRAFFIC CONTROL - PHASE 2

GUAM
DEPARTMENT OF PUBLIC WORKS

| VILLAGE | TERRITORY | PROJECT | DRAWING | SHEET NO. | TOTAL NO. |
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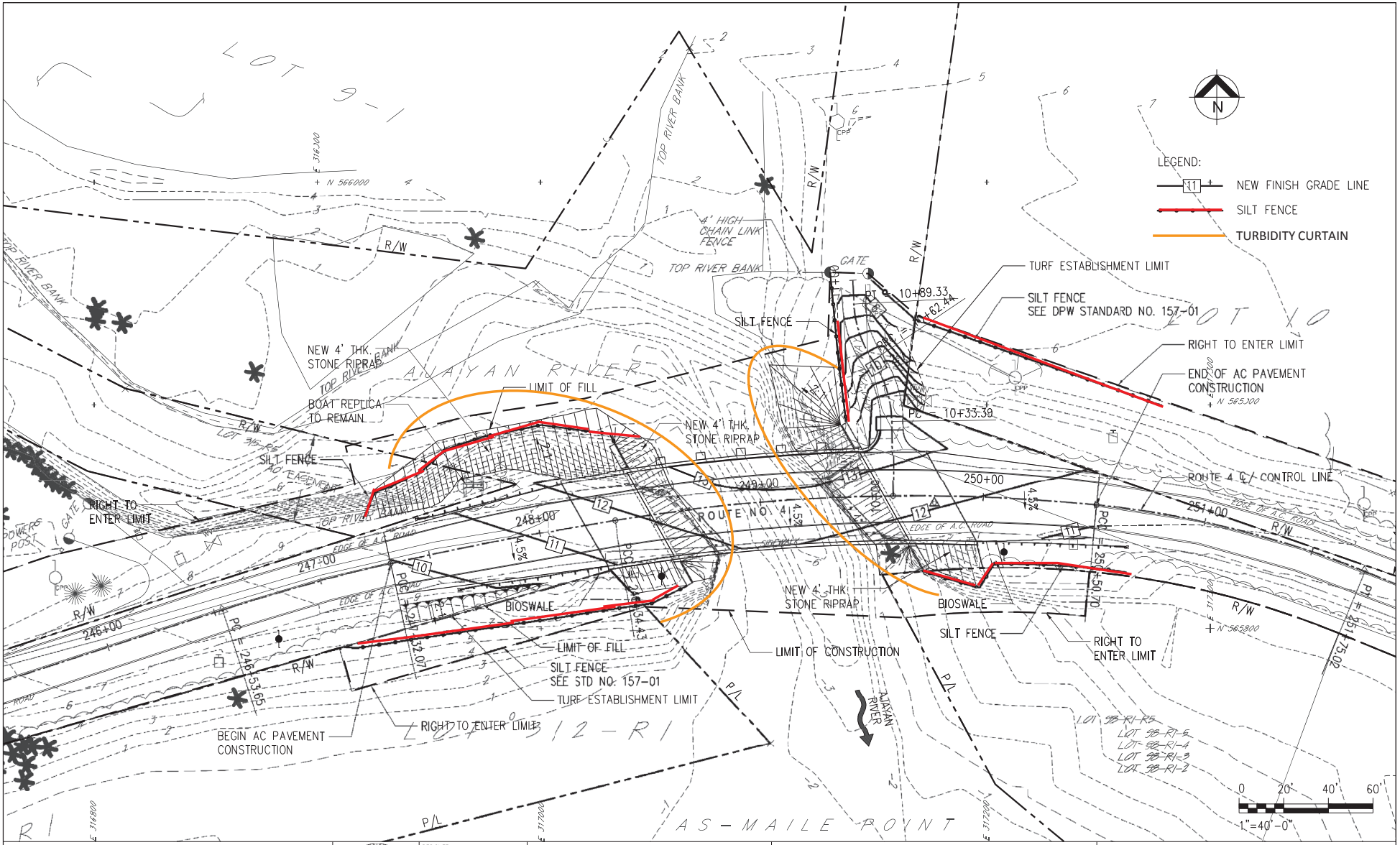
| MERIZO | GUAM | GQ-ER-0004(114) | TC-3 | 21 | 66 |

100% SUBMITTAL

# Appendix F
# BMP Drawings

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I CERTIFY THAT THIS WORK WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION

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|---|---|
| DESIGNER | NCM |
| DETAILER | MDC/RSS |
| CHECKER | AMD |
| DATE | JULY 31, 2013 |

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# AJAYAN BRIDGE REPLACEMENT
# MERIZO, GUAM
## GRADING AND DRAINAGE PLAN/ STORM WATER MANAGEMENT BMPS

GUAM
DEPARTMENT OF PUBLIC WORKS

| VILLAGE | TERRITORY | PROJECT | DRAWING | SHEET NO. | TOTAL NO. |
|---|---|---|---|---|---|
| MERIZO | GUAM | GQ-ER-0004(114) | C-7 | 14 | GG |

# Appendix G
# Agency Consultation Correspondence

**G.1 Government of Guam, Department of Agriculture, Division of Aquatic and Wildlife Resources**

**G. 2 Government of Guam, Bureau of Statistics and Plans, Coastal Management Program**

**G.3 Government of Guam, Department of Land Management**

**G.4 Government of Guam, DLM, Guam Seashore Protection Commission**

**G.5 Government of Guam, Environmental Protection Agency**

**G.6 Government of Guam, State Historic Preservation Office**

**G.7 National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Pacific Islands Regional Office, Protected Resources Divisions – Endangered Species Act Consultation**

**G.8 National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Pacific Islands Regional Office, Habitat Conservation Division - Essential Fish Habitat Consutlation**

**G.9 United States Fish and Wildlife Service**

**G.10 United States Army Corp of Engineers**

**G.11 United States Coast Guard**

## G.1 Government of Guam, Department of Agriculture, Division of Aquatic and Wildlife Resources

AECOM
1001 Bishop Street
Suite 1600
Honolulu, HI 96813
www.aecom.com

808 523 8874 tel
808 523 8950 fax

April 17, 2012

Mariquita F. Taitague
Department of Agriculture
Government of Guam
Division of Aquatic and Wildlife Resources
163 Dairy Road
Mangilao, Guam 96913

Subject: Ajayan Bridge Replacement Project, Division of Aquatic and Wildlife Resources Consultation

Director Taitague,

The U.S. Department of Transportation - Federal Highways Administration (FHWA), in coordination with the Guam Department of Public Works (DPW) proposes to replace the existing Ajayan River Bridge located on Route 4, on the boundary between Merizo and Inarajan. AECOM is contacting your agency on behalf of the DPW and FHWA. A Categorical Exclusion document for compliance with the National Environmental Policy Act (NEPA) will be prepared for the project.

**Ajayan Bridge Existing Condition**
The Ajayan River Bridge is located on Route 4 on the boundary between Merizo and Inarajan, as shown in Figure 1-1.

The existing single span cast-in-place concrete box girder bridge was constructed in 1968 with a span of approximately 76.2 feet and a skew of 40 degrees. Abutments are founded on concrete piles and the deck has an asphalt concrete wearing surface. The most recent bridge inspection report, dated May 27, 2004, noted that the substructure and channel are rated in serious condition with cracking and differential movement noted for substructure units and significant scour at abutments, as shown in the attached Photo Log. The channel alignment and waterway opening are also noted as deficient.

**Proposed Action**
The proposed action would replace the existing two-lane bridge across the Ajayan River just upstream of the river mouth as it enters the ocean. Bridge abutment slopes would be protected from erosion by placement of stone rip rap. There would be minimal roadway approach work. Proposed improvements include two 12-foot lanes with 8-foot paved shoulders. Roadway alignment and grade would match existing at points of tie-in. Roadway work within project limits would include removal of the existing pavement and design of full-depth pavement replacement and replacement of guardrail. The proposed action would include geotechnical sampling, testing, and analysis. As shown in Figure 1-2, soil borings for bridge foundations would be taken at two locations, one at each proposed substructure unit, to a depth of at least 100 feet or at least 10 feet into competent bedrock, whichever is shallower. Additionally, two shallow borings to a depth of 15 feet would be taken within the roadway approach area. All work would be conducted within existing right-of-way.

AECOM

The FHWA requests that you review the project information provided above to determine if there are any Division of Aquatic and Wildlife Resources issues or other Department of Agriculture issues that may be affected by this undertaking. Please feel free to contact me at 808.356.5394 (office), 808.223.9213 (cell), or via email at Jennifer.Scheffel@aecom.com.

Thank you for your attention to this project notification and any comments you may have.

Sincerely,

Jennifer M. Scheffel
Environmental Planner

Enclosures: Figure 1-1: Site Location Map
Figure 1-2: Geotechnical Soil Boring Locations
Photo Log

cc: Jay T. Gutierrez, DAWR
Brent Tibbatts, DAWR
Thomas Flores, Jr., DAWR
Joanne M. S. Brown, DPW
Ramon Padua, DPW
Joaquin Blaz, DPW
Paul Wolf, PB
Nora Camacho, PB
James Mischler, PB
Edgar Hipolito, AECOM
Kosal Krishnun, AECOM
Nemencio Macario, N.C. Macario & Associates, Inc.

# Department of Agriculture
# Dipåttamenton Agrikottura

**163 Dairy Road, Mangilao, Guam 96913**

| | |
|---|---|
| Director's Office | 734-3942/43; Fax 734-6589 |
| Agricultural Dev. Services | 734-3946/47; Fax 734-8096 |
| Animal Health | 734-3940 |
| **Aquatic & Wildlife Resources** | **735-3955/56; Fax 734-6570** |
| Forestry & Soil Resources | 735-3949/50; Fax 734-0111 |
| Plant Nursery | 734-3949 |
| Plant Inspection Facility | 472-1426; 475-1427; Fax 477-9487 |

**Edward J.B. Calvo**
**Governor**

**Raymond S. Tenorio**
**Lt. Governor**

**Mariquita F. Taitague**
**Director**

**Manuel Q. Cruz**
**Deputy Director**


**May 23, 2012**

Ms. Jennifer M. Scheffel
Environmental Planner
AECOM
1001 Bishop Street
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Honolulu, HI 96813
www.aecom.com

**Re: Ajayan Bridge Replacement Project, Division of Aquatic and Wildlife Resources Consultation**

Dear Ms. Scheffel:

On April 24, 2012, the Department of Agriculture's Division of Aquatic and Wildlife Resources (DAWR) received a letter dated April 17, 2011 requesting for review and comments regarding the proposed Replacement project for the Agfayan Bridge, Merizo to adhere to the Categorical Exclusion document for compliance with the National Environmental Policy Act.

The following comments to be addressed for the proposed Agfayan Bridge replacement project are as follows, but not limited to:

1. Species protected under the Local and Federal Endangered Species Act, such as the Common moorhen (*Gallinula cholorpus*), Micronesian starling (*Aplonis opaca*), Mariana fruit bat (*Pteropus m. mariannus*), Pacific tree snail (*Partula radiolata*), Green sea turtle (*Chelonia mydas*), Hawksbill sea turtle (*Eretmochelys imbricata*), and native skinks may be present at the proposed project site. Surveys to determine the presence for the native tree snail and native skink should occur prior the implementation of the project.

2. Many of the of Guam's species of greatest conservation need, as documented within the Guam Comprehensive Wildlife Conservation Strategy (2006), may also occur at the project site. Surveys to determine the absence or presence of these species should be conducted prior to the implementation of the project.

3. From September to April, migratory birds, protected under the Migratory Bird Treaty Act of 1917, may use the project site as a foraging ground. The protected species must not be harmed or harassed.

4. Erosion control device(s) should be employed at the job site preventing debris and soil from entering the river. Device(s) must be secured and able to withstand heavy rains and winds.

5. Construction debris must be removed immediately and not stored at the job site. Debris includes but not limited to, excavated soil, cement material, pipings, asphalt, etc.

6. Dust control devices or methodology (wetting) must be employed at the jobsite during construction.

7. Contractor must consult with the Department at least a week in advance prior any vegetation removal action.

8. Contractor must have absorbent pads readily available at the job site during heavy equipment operations and equipment must be inspected for leaks prior to use.

9. Lighting to be use during construction in the evening hours must be directed away from the shoreline facing inland to minimize impact to sea turtles.

DAWR is looking forward to future communication regarding this project. Feel free to contact Mr. Celestino Aguon, DAWR Chief, Mr. Jeff Quitugua and Mr. Brent Tibbatts, DAWR Biologists for comments or questions with this matter.

M. F. Taitague

**MARIQUITA F. TAITAGUE**

# Department of Agriculture
# Dipåttamenton Agrikottura

**163 Dairy Road, Mangilao, Guam 96913**

| | |
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| Director's Office | 734-3942/43; Fax 734-6589 |
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**Edward J.B. Calvo**
**Governor**

**Raymond S. Tenorio**
**Lt. Governor**

**Mariquita F. Taitague**
**Director**

**Manuel Q. Cruz**
**Deputy Director**


**January 08, 2013**

Ms. Jennifer M. Scheffel
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www.aecom.com

**Re: Ajayan Bridge Replacement Project, Division of Aquatic and Wildlife Resources Consultation**

Dear Ms. Scheffel:

The Department had provided comments but had referenced the Agfayan Bridge (attached). We provide the following comments to be addressed for the proposed Ajayan Bridge replacement project as follows, but not limited to:

1. Species protected under the Local and Federal Endangered Species Act, such as the Common moorhen (*Gallinula cholorpus*), Micronesian starling (*Aplonis opaca*), Mariana fruit bat (*Pteropus m. mariannus*), Pacific tree snail (*Partula radiolata*), Green sea turtle (*Chelonia mydas*), Hawksbill sea turtle (*Eretmochelys imbricata*), and native skinks may be present at the proposed project site. Surveys to determine the presence for the native tree snail and native skink should occur prior the implementation of the project.

2. Many of the of Guam's species of greatest conservation need, as documented within the Guam Comprehensive Wildlife Conservation Strategy (2006), may also occur at the project site. Surveys to determine the absence or presence of these species should be conducted prior to the implementation of the project.

3. From September to April, migratory birds, protected under the Migratory Bird Treaty Act of 1917, may use the project site as a foraging ground. The protected species must not be harmed or harassed.

4. Erosion control device(s) should be employed at the job site preventing debris and soil from entering the river. Device(s) must be secured and able to withstand heavy rains and winds. All EPA and ACOE Water Quality BMPs must be followed.

5. Construction debris must be removed immediately and not stored at the job site. Debris includes but not limited to, excavated soil, cement material, pipings, asphalt, etc.

6. Dust control devices or methodology (wetting) must be employed at the jobsite during construction.

7. Contractor must consult with the Department at least a week in advance prior any vegetation removal action.

8. Contractor must have absorbent pads readily available at the job site during heavy equipment operations and equipment must be inspected for leaks prior to use.

9. Lighting to be use during construction in the evening hours must be directed away from the shoreline facing inland to minimize impact to sea turtles.

10. The river channel cannot be blocked. Guam's native river organisms must be able to reach the ocean as a part of their life history. Open passage must be maintained at all times.

11. Coral spawning takes place around the last quarter moon of July and August. No in-water work should take place within three days of this moon phase.

12. The Ajayan Bridge is located in the Achang Reef Flat Marine Protected Area (MPA). There is no take of marine organisms allowed within this MPA. Any take to include killing, damaging, or wounding of marine organisms is a violation of local natural resource laws.

DAWR is looking forward to future communication regarding this project. Should you have any questions, please contact Mr. Jeffrey Quitugua or Mr. Brent Tibbatts, at (671) 735-3955/56.

M. F. Taitague

**MARIQUITA F. TAITAGUE**

**Attachment(s):**

*The Honorable*
**Eddie Baza Calvo**
*Governor*

*The Honorable*
**Ray Tenorio**
*Lieutenant Governor*

public works
DIPATTAMENTON CHE'CHO' PUPBLEKO
**Carl V. Dominguez**
*Director*
**Jessie B. Palican**
*Deputy Director*

June 4, 2014

Ms. Mariquita F. Taitague
Department of Agriculture
Government of Guam
Division of Aquatic and Wildlife Resources
163 Dairy Road
Mangilao, Guam 96913

RECEIVED
6.10.14
1:25pm

**Subject: Guam Endangered Species Act Regulation No. 9 Consultation for Proposed Ajayan Bridge Replacement, Route 4, Project No. GQ-ER-0004(114)**

Dear Ms. Taitague:

The Government of Guam (GovGuam) Department of Public Works (DPW) and the U.S. Department of Transportation (USDOT) Federal Highways Administration (FHWA) proposes to replace the existing Ajayan River Bridge located on Route 4, on the boundary between Merizo and Inarajan. This letter provides additional project details, results from flora and fauna surveys performed for the project, proposed avoidance and minimization measures, and an assessment of potential effects to species protected under Guam Endangered Species Regulation No. 9 [5 GCA, Sect. 63.205(c)].

## Ajayan Bridge Existing Condition

The Ajayan Bridge is located on Route 4 on the boundary between Merizo and Inarajan. The bridge provides two lanes that cross the Ajayan River just upstream of the river mouth as it enters the ocean, as shown in Enclosure 1 – Project Location Map.

The existing single-span cast-in-place concrete box girder bridge was constructed in 1968, with a span length of approximately 76.2 feet and a skew of 40 degrees. Abutments are founded on concrete piles; the deck has an asphalt concrete wearing surface. The most recent bridge inspection report, dated May 27, 2004, noted that the substructure and channel are rated in serious condition. The damage noted includes cracking and differential movement of substructure units and significant scour at abutments, as shown in Enclosure 2 – Photo Log.

## Project Description

The existing bridge will be demolished and replaced with a new 40-foot-wide by 105-foot-long bridge. The proposed improvements include two 12-foot-wide lanes and two 8-foot-wide paved shoulders. Roadway alignment and grade will match the existing at the point of tie-in.

To accommodate traffic while the new bridge is being constructed, the bridge will be demolished in two phases, demolishing one side (longitudinally) of the bridge at a time. This will allow two-way traffic (one lane, controlled by traffic lights) to use the bridge during demolition and construction.

The project will entail the demolition and removal of the existing bridge structure and existing pile caps. The existing piles below the waterline will be cut and capped at the mudline, but left in-place. This will provide for minimal disturbance of the aquatic ecosystem. Roadway work within the project limits will include removal of the existing pavement, full-depth pavement replacement, and replacement of the guardrails. The proposed action will also include geotechnical sampling, testing, and analysis. As shown in Enclosure 3 – Proposed Geotechnical Soil Boring Locations, soil borings for bridge foundations will be taken at two locations, one at each proposed substructure unit, to a depth of at least 100 feet or at least 10 feet into competent bedrock, whichever is shallower. Additionally, two shallow borings to a depth of 15 feet will be taken within the roadway approach area.

**Demolition and Construction Methods**

Demolition

Bridge demolition will include removal of the existing bridge deck, box beam, abutments, wing walls, guardrails, and parapet. The existing bridge is approximately 29.6 feet wide and will be demolished in two phases to allow for one lane to remain open for traffic. Phase 1 will include saw-cutting the westbound portion of the existing bridge and removing it by crane. Phase 2 will include the same actions to the eastbound portion of the existing bridge. Before demolition and removal, a temporary concrete barrier will be installed on the existing bridge, and existing utilities will be temporarily relocated to the opposite portion of the bridge during each phase.

Demolition of the existing abutment walls will be accomplished by use of jackhammers and/or hoe rams, and removed via mechanical equipment such as a backhoe. The existing bridge abutments will be demolished and the existing piles will be cut down to the river bed. The soil between the old abutment and new abutment will be excavated, and 48-inch-thick grouted riprap will be placed on a gradual slope from the new abutment to the remaining old pilings, as shown in Enclosure 4 – Bridge Profile. A combined total of approximately 540 cubic yards of soil and concrete abutment wall material will be excavated from below the mean high water (MHW) line of the Ajayan River. The combined total linear disturbance to the stream channel from the excavation of the soil and concrete abutment wall material will be approximately 407 linear feet.

Construction

Construction of the new bridge will also be performed in two phases so that two-way signal-controlled traffic can be maintained in one lane during construction. Phase 1 will include demolition of the existing westbound portion of the bridge and construction of the new westbound portion of the bridge. During Phase 1, utilities and two-way signal-controlled traffic will be temporarily relocated to the eastbound portion of the existing bridge. Phase 2 will include demolition of the existing eastbound portion of the bridge and construction of the new eastbound portion of the bridge. During Phase 2, utilities will be permanently installed in the westbound portion of the new bridge, and two-way signal-controlled traffic will be temporarily relocated to the westbound portion of the new bridge. Work areas for Phase 1 and Phase 2 are shown in Enclosure 5 – Traffic Control Plans.

A new bridge foundation will be constructed inland, or behind, the existing abutment to minimize disturbance to the river channel. The proposed abutments will be set back from the existing abutments. The soil and grouted riprap between the remaining existing piles and the new abutment will be sloped back at a 3H:1V ratio. The two new abutments will be constructed at the top of the slope and supported by twelve piles (per abutment), for a combined total of twenty-four new octagonal 16.5-inch-diameter concrete piles (100 tons per pile). The new abutments and abutment piles will be constructed above the MHW line.

Approximately 947 cubic yards of grouted stone riprap will be placed along the abutment walls, below the MHW line, to protect the abutment from erosion caused by waves. The riprap (fill material) will be placed along approximately 401 linear feet of stream channel. The riprap will

be placed within the excavation footprint and will not impact additional areas of the stream channel.

Best Management Practices

Best management practices (BMPs) will include catchment platforms and protective netting, silt screen fences, and turbidity curtains. Catchment platforms and protective netting will be installed under the bridge to keep debris from falling into the water. Silt screen fences will be placed at the slope toe around the river edges to prevent erosion and rubbish from going into the water. Turbidity curtains will be installed at both river banks surrounding the work areas to prevent the spread of silt and sediment into the river and bay (see Enclosure 6 – BMP Drawings).

**Natural Environments**

The proposed project is located within the southern end of Guam, which is characterized by hilly volcanic slopes descending from approximately 800 feet in elevation to sea level over distances of less than 2.5 miles. The project site is situated between the Inarajan and Manell watersheds. The Ajayan Bridge is situated on the southern end of the Ajayan River, adjacent to the Ajayan Bay discharge point. Flora and fauna surveys of the proposed project area were conducted by SWCA Environmental Consultants (SWCA) on November 6 and 7, 2013. During these surveys, emphasis was placed on identifying special-status species. The following paragraphs describe the existing terrestrial and aquatic environments that occur within the proposed project area as reported by SWCA and Guam Department of Agriculture, Division of Aquatic and Wildlife Resources (DAWR).

Terrestrial Ecology

Forest surrounding the project area consists mostly of secondary thicket/scrub forest with some ravine forest. Areas of forested palustrine wetlands are located along the east and west banks of the Ajayan River. Several typhoons that occurred between the 1970s and 1990s changed the vegetation in the area dramatically. Site visits conducted by Guam DAWR staff in February and March 2013 found that pago (*Hibiscus tiliaceus*) and tangantangan (*Leucaena leucocephala*) were the two common species in the project area.

During flora surveys performed by SWCA on November 6 and 7, 2013, a total of 19 plants were identified to either genera or species. The seven native plants documented consisted of five trees (pago, *Pandanus tectorius*, *Bougainvillea glabra*, *Callicarpa candicans*, and *Morinda citrifolia*), one fern (*Polypodium scolopendria*), and one grass (*Saccharum spontaneum*). The non-native plants documented were pugua (*Areca catechu*), coconut trees (*Cocos nucifera*), beggar's tick (*Bidens alba*), Siam weed (*Chromolaena odorata*), mile-a-minute vine (*Mikania scanden*), daok (*Calophyllum inophyllum*), papaya (*Carica papaya*), tangantangan, kamachile (*Pithecellobium dulce*), and *Musa* sp.

Shoreline Ecology

The project area is located at the mouth of the Ajayan River as it discharges into Achang Reef Flat. The shoreline vegetation is composed primarily of coconut trees, pago, and tangantangan.

Although not located within the boundaries of the project area, a small Nypa palm (*Nypa fruticans*) (also referred to as "Nipa") community was identified approximately 10 meters upstream of the Ajayan River. This species is a wetland obligate and grows in brackish marshes.

Aquatic Ecology

The Ajayan River flows south and discharges at the Ajayan Bay. The Ajayan Bay includes the eastern portion of the Achang Reef Flat Marine Preserve, as shown in Enclosure 7 – Achang Reef Flat Marine Preserve. The Ajayan River channel cuts completely through the reef flat at Ajayan Bay. The reef flat consists of inner and outer reef flats that are exposed at low tide. Mangroves and sea grass beds are present in the vicinity of the project site.

According to the University of Guam Marine Laboratory's Guam Coastal Atlas[1] the benthic habitat of the river channel is composed of "sand, uncolonized 90% to 100%", extending from inland waters to 500 meters offshore. The benthic habitat to the east of the channel is composed of "spur and groove, coral 10% to <50%" near the shore, and "pavement, turf 50% to <90%" after approximately 100 meters offshore. The benthic habitat to the west of the channel is composed of "spur and groove, coral 50% to <90%" near the shore, and "pavement, coral 10% to <50%" after approximately 50 meters offshore.

The Achang Reef Flat supports primarily hard corals. Only two soft coral species have been identified by the University of Guam Marine Lab, during monitoring of the site.

Achang Reef Flat is classified as M-1, Excellent. Waters in this category are suitable for whole-body contact and recreation. These waters are also needed for research and to ensure the preservation and protection of marine life, including coral, reef-dwelling organisms, fish, and related resources, and aesthetic enjoyment. The surface waters of the Ajayan River are classified as S-3, Low. Waters in this category are used primarily for commercial, agriculture, or industrial activity. Aesthetic enjoyment and recreational body contact are limited. Maintenance of aquatic life is also limited[2].

**Agency Coordination**

In April 2012, AECOM sent a letter to Guam Department of Agriculture Division of Aquatic and Wildlife Resources (DAWR) describing the proposed bridge replacement project and requesting guidance on potential concerns. In January 2013, AECOM received a letter from DAWR providing; (1) a list local and federal Endangered Species Act (ESA) protected species that may be present at the project site, (2) instruction that surveys for native tree snails, native skinks, and Guam's Species of Greatest Conservation Need (SOGCN) should be conducted prior to implementation of the project, and (3) a list of measures and best management practices that should be implemented to avoid and minimize potential impacts to species and habitats (Enclosure 8 – January 2013 Response from DAWR).

Letters describing proposed project activities and requesting lists of special-status species were also sent to the United States Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS). FHWA is sending requests to USFWS and NMFS for concurrence on ESA effect determinations. An Essential Fish Habitat consultation request has been submitted to NMFS. A description of proposed project activities has been provided to the U.S. Army Corps of Engineers (ACOE). A formal request for Clean Water Act Section 404 Permit and Rivers and Harbors Act Section 10 Permit will submitted to the ACOE.

As requested by the various agencies, flora and fauna surveys were completed for this project. SWCA performed the flora and fauna surveys and their report is included as Enclosure 9 – Flora and Fauna Surveys for the Ajayan Bridge Replacement Project.

**Species Protected Under the Local and Federal Endangered Species Act**

Based on background research and the information provided by NMFS, USFWS, and the DAWR, the only species protected under the local and federal ESA, that may occur within the proposed project area are the locally and federally endangered Mariana common moorhen (*Gallinula choropus guami*), the locally endangered and federally threatened Mariana fruit bat (*Pteropus m. mariannus*), the locally endangered and federal candidate species for listing Pacific tree snail (*Partula radiolata*), locally and federally threatened green sea turtle (*Chelonia mydas*), locally and the federally endangered hawksbill sea turtle (*Eretmochelys imbricate*) and locally endangered native skinks, including the snake-eyed skink (*Cryptoblepharus poecilopleurus*), tide-pool skink (*Emoia atrocostata*), azure-tailed skink (*Emoia cyanura*), Slevin's skink (*Emoia slevini*), and moth skink (*Lipinia noctua*).

Mariana Common Moorhen – Locally and Federally Endangered

1 University of Guam Marine Laboratory's Guam Coastal Atlas. Online at www.guammarinelab.com/coastal.atlas/htm/Maps.htm.
2 GEPA. 2001. Guam Water Quality Standards. 2001 Revision.

The federally endangered Mariana common moorhen is a slate-black bird about 14-inches in length. Distinguishing physical characteristics include a red bill and frontal shield, white under tail coverts, a white line along the flank, and long olive green legs.

The Mariana common moorhen are found in natural and man-made wetland areas of Guam, Saipan, Tinian, and Pagan of the Mariana Islands. Only these islands in the Mariana Archipelago have permanent freshwater wetlands capable of supporting the moorhen. The Mariana moorhen inhabits emergent vegetation of freshwater marshes, ponds and placid rivers. The key characteristics of moorhen habitat are the combination of robust emergent vegetation cover and open water areas.

The Mariana common moorhen nests throughout the year and typically lays eggs concealed in emergent vegetation near open water. Moorhens feed on both plant and animal matter in or near water. Grasses, adult insects, and insect larvae have been reported in moorhen stomachs[3].

Mariana Fruit Bat – Locally Endangered and Federally Threatened

The locally endangered and federally threatened Mariana fruit bat is a medium-sized bat weighing 0.66 to 1.15 pounds, with a forearm length ranging from 5.3 to 6.1 inches. The abdomen is colored black to brown, with interspersed gray hair. The shoulders and sides of the neck are usually bright golden brown, but may be paler in some individuals. The head is brown with rounded ears and large eyes.

The Mariana fruit bat is a subspecies endemic to the Mariana archipelago. It is a highly colonial species forming large dense roosts in multiple adjacent trees. There is small percentage of non-colonial solitary roosting individuals. Mating and nursing young have been observed year-round on Guam with no consistent annual peak in births.

The bats' diet is comprised of fruits, nectar, pollen and some leaves. Due to the rapid digestion and metabolism of such foods the bats are reliant on forest habitat with diverse food sources that are available throughout the year. The Mariana fruit bat forage and roost primarily in native forest. Occasionally foraging in agricultural forests composed primarily of nonnative plants. The bats inhabit several native forest types, including primary and secondary limestone forest, volcanic forest, old coconut plantations, and groves of gaga or ironwood (*Casuarina equisetifolia*). Grass lands with isolated trees are also used by the bats. Foraging sometimes occurs at farms and residential areas with flowering or fruiting trees. On Guam, large *Ficus* spp. were the favored roosting sites. After the loss of many of these trees to typhoons, roosting shifter to *Aglaia mariannensis* (mapunao), *Macaranga thompsonii* (pengua), *Mammea odorata* (chopak), and *Neisosperma oppositifolia* (fagot). Presently the Mariana fruit bat persists in small numbers on Guam, primarily in the northern region of the island[4].

Pacific Tree Snail – Locally Endangered and Federal Candidate Species for Listing

The locally endangered Pacific tree snail is endemic to the island of Guam. Tree snails live in cool, shaded forest habitats with high humidity and low air movement[5]. The Pacific tree snail was once common along stream courses in southern Guam[6].

Green Sea Turtle – Locally and Federally Threatened

The federally threatened green sea turtle is the largest of the cheloniidae, with adults that can exceed 3.2 feet in carapace length and 268 pounds in body mass. Characteristics that distinguish the green seas turtle from

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3 U.S. Fish and Wildlife Service. 1991. Recovery Plan for the Mariana Common Moorhen (*Gallinula choropus guami*). U.S. Fish and Wildlife Service. Portland, OR.

4 U.S. Fish and Wildlife Service. 2009. Draft Revised Recovery Plan for the Mariana Fruit Bay or Fanihi (*Pteropus mariannus mariannus*). U.S. Fish and Wildlife Service, Portland, Oregon.

5 Guam National Wildlife Refuge and U.S. Fish and Wildlife Service. 2009. Guam National Wildlife Refuge Comprehensive Conservation Plan. Guam National Wildlife Refuge, Yigo, Gaum and U.S. Fish and Wildlife Service. Honolulu, Hawaii.

6 Hopper, D.R. and B.D. Smith. 1992. Status of tree snails (Gastropoda: Partulidae) on Guam, with a resurvey of sites studied by H.E. Crampton in 1920. Pacific Science 46: 77-85.

other species of sea turtle include a smooth carapace with four pairs of lateral scutes, a single pair of prefrontal scales, and a lower jaw-edge that is coarsely serrated, corresponding to strong grooved and ridges on the inner surface of the upper jaw.

The green sea turtle is a circumglobal species found in tropical seas and, to a lesser extent, in subtropical waters with temperatures above 20°C. In the Pacific United States (U.S.) and its territories, the green sea turtle is found along the coasts of Hawaii, American Samoa, Guam, the Commonwealth of the Northern Mariana Islands, and unincorporated U.S. island possessions.

The green sea turtle occupies three habitat types that include open beaches, open sea, and feeding grounds in shallow, protected waters. The open beaches are used for nesting purposes where the adult female green seas turtles will emerge at night to excavate nests and deposit a clutch that may be in excess of approximately 100 eggs. The green sea turtle use the shallow water habitats to forage, feeding on selected macroalgae and sea greases. The green sea turtle spends the remaining time in the open sea were they may rest and/or are in transient to feeding grounds and/or nesting habitat[7].

Hawksbill Sea Turtle – Locally and Federally Endangered

The federally endangered hawksbill sea turtle is recognized by their relatively small (carapace length less than 3.1 feet), narrow head with tapering "beak," thick, overlapping shell scutes, and strongly serrated posterior margin of the carapace. In addition, hawksbills may be distinguished from the green sea turtle by the transverse division of the prefrontal scales into two pairs (these scales are elongate and undivided in the green sea turtle).

Hawksbill sea turtles are circumtropical in distribution, generally occurring from 30°N to 30°S latitude within the Atlantic, Pacific, and Indian Oceans and associated bodies of water. Along the far western and southwestern Pacific, hawksbills nest on the islands and mainland of Southeast Asia, from China and Japan, throughout the Philippines, Malaysia, and Indonesia, to Papua New Guinea, the Solomon Islands, and Australia.

The hawksbill sea turtle typically selects remote pocket beaches with little exposed sand to nest and deposit their eggs. The nest site is often within the cover of woody vegetation, although some will occasionally nest in grass or open sand if preferred cover is not accessible. Hawksbills are typically found feeding on jellyfish, sea urchins, and sponges within the vicinity of rock or reef habitat in shallow tropical waters with little turbidity[8].

Native Skinks – Locally Endangered

Locally endangered skinks on the island of Guam include snake-eyed skink, tide-pool skink, azure-tailed skink, Slevin's skink, and moth skink. Populations of snake-eyed skink, Slevin's skink, azure-tailed skink, and moth skink are no longer found on Guam or persist in very low numbers[9].

Potential Suitable Foraging and Nesting Habitat for Mariana Common Moorhen

No wetlands as designated by the National Wetlands Inventory are located in the project area. However, potentially suitable wetland foraging and nesting habitat for Mariana common moorhen is present within the vicinity of the proposed project. Freshwater wetlands have been identified less than 10 meters upstream from the project site. While uncommon, Mariana common moorhens have been observed near this area. The area has been designated as habitat of low potential for this species.

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7 National Marine Fisheries Service and U.S. Fish and Wildlife Service. 1998. Recovery Plan for U.S. Pacific Populations of the Green Turtle (*Chelonia mydas*). National Marine Fisheries Service. Silver Spring, MD.

8 National Marine Fisheries Service and U.S. Fish and Wildlife Service. 1998. Recovery Plan for U.S. Pacific Population of the Hawksbill Turtle (*Eretmochelys imbricate*). National Marine Fisheries Service. Silver Spring, MD.

9 Guam National Wildlife Refuge and U.S. Fish and Wildlife Service. 2009. Guam National Wildlife Refuge Comprehensive Conservation Plan. Guam National Wildlife Refuge, Yigo, Guam and U.S. Fish and Wildlife Service. Honolulu, Hawaii.

Potential Suitable Foraging and Roosting Habitat for Mariana Fruit Bat

The Mariana fruit bat is not anticipated to use habitat at or near the proposed project site. Secondary thicket/scrub forest and trees including pago, *Pandanus tectorius*, *Bougainvillea glabra*, *Callicarpa candicans*, and *Morinda citrifolia* are present at the project site. However, this is not the preferred forest type or tree species inhabited by Mariana fruit bat. Forest habitat at the project site may not provide diverse food sources need to support Mariana fruit bats. The Mariana fruit bat is primarily found in the northern region of the island, persisting in small numbers. No Mariana fruit bats were observed during station count surveys of the project area performed on November 6 and 7, 2013, described in Enclosure 9 – Flora and Fauna Surveys for the Ajayan Bridge Replacement Project.

Potential Suitable Habitat for Pacific Tree Snail

Suitable habitat for Pacific tree snail is present within the vicinity of the proposed project. The Pacific tree snail was once common along stream courses in southern Guam. However, no Pacific tree snails were recorded during partulid tree snail surveys of the project area performed on November 6 and 7, 2013, described in Attachment I – Flora and Fauna Surveys for the Ajayan Bridge Replacement Project.

Potential Suitable Foraging and Nesting Habitat for Green and Hawksbill Sea Turtles

Suitable foraging habitat for green sea turtle and the hawksbill sea turtle is present within the vicinity of the proposed project. The Achang Reef Flat Marine Preserve provides foraging habitat for sea turtles, with food sources such as macroalgae, seagrass beds, and reef-dwelling organisms. Sea turtles have been observed foraging in Ajayan Bay.

Turtle nesting areas are not present at the project site. The *Recovery Plan for U.S. Pacific Populations of Green Turtle* (dated Jan. 12, 1998) reports that there is some low-level nesting of green sea turtle on Guam. The *Recovery Plan for U.S. Pacific Populations of the Hawksbill Turtle* (dated Jan. 12, 1998) reports that hawksbill nesting is rare on Guam. Known turtle nesting beaches on Guam include Ritidian National Wildlife Refuge, Haputo, Urunao, Tumon Bay, Cabras Island, Spanish Steps, Cocos Island, Acho Bay, Nomña Bay, Jinapsan, Tarague Beach, and the waterfront annex of Naval Base Guam[10&11]. The closest known turtle nesting beach to the project site is Acho Bay located approximately one mile (1.6 kilometers) northeast of the project site.

Potential Suitable Habitat for Locally Endangered Native Skinks

Suitable habitat for native skinks is present within the vicinity of the proposed project. However, the likelihood of locally endangered native skinks (snake-eyed skink, tide-pool skink, azure-tailed skink, Slevin's skink, and moth skink) being present in the project area is low, as populations of snake-eyed skink, Slevin's skink, azure-tailed skink, and moth skink may no longer be found on Guam. No native skinks were recorded during trap and visual surveys of the project area performed on November 6 and 7, 2013, described in Attachment I – Flora and Fauna Surveys for the Ajayan Bridge Replacement Project.

**Mariana Common Moorhen – Assessment of Potential Effects**

Suitable wetland foraging and nesting habitat for Mariana common moorhen is present within the vicinity of the proposed project. Therefore, the Mariana common moorhen could be impacted by various components of the proposed project. The following paragraphs describe the potential effects the proposed project may have on Mariana common moorhen.

Loss of Forging, Roosting and Nesting Habitat

Wetlands located less than 10 meters north of the project site provide potentially suitable foraging, roosting and nesting habitat for Mariana common moorhen. The proposed project will not result in the direct loss or direct impacts to wetland habitat. Wetlands will be designated as Environmentally Sensitive Areas where no

10 Department of Agriculture, Division of Aquatic and Wildlife Resources, Guam (DAWR). 2004. Guam Sea Turtle Recovery Annual Progress Report - March 1, 2004 through August 31, 2004. 9 pp.

11 Grimm, G. and J. Farley. 2008. Sea Turtle Nesting Activity on Navy Lands, Guam, 2007 – 2008. U.S. Navy, NAVFAC Marianas Environmental, Guam. November 2008. 6 pp.

construction activities, equipment, or personnel are allowed. Wetland habitat north of the project site could be degraded or temporarily impacted by various activities associated with the proposed project. Grading and excavating would be the primary activities that could contribute to the degradation or temporary impacts to wetland habitat. The release of sediment into Ajayan River could occur as the existing abutment walls are demolished and removed, soil behind the existing abutment walls is removed, and new grouted riprap is installed. The sediment release into the Ajayan River could migrate upstream (counter the primary direction of flow) to the wetlands. However, BMPs have been developed to avoid and minimize impacts to Mariana common moorhen habitat as a result of soil erosion and sedimentation of wetlands. A detailed list of the BMPs that would be implemented for the proposed project is provided in the Avoidance and Minimization Measures section of this document. Based on this information, it has been determined that the loss of potential foraging habitat due to the release of sediment would be discountable and would have insignificant effects on the Mariana common moorhen.

Increased Exposure to Human Activity, Construction Noise and Light

During construction, there would be an increased presence of human activity, construction noise and light. The Mariana common moorhen is known to be wary and to be closely associated with cover provided by edge vegetation. Potential impacts to moorhen from the increased presence of human activity, noise and light would be behavioral disturbance including avoidance of the area and temporary abandonment of nesting, roosting and feeding sites. BMPs have been developed to avoid and/or minimize the potential impacts to Mariana common moorhen from human and construction activity. Some of the BMPs that would be implemented for the proposed project include performing daily surveys, prior to the commencement of work, to insure moorhen are not within the work zone; work stoppage upon observing moorhen within the proposed project area, allowing it to leave on its own; limiting activity beyond the work zone; avoiding night work to the extent practical; minimizing vegetation clearing; performing focused bird surveys prior to vegetation clearing; and avoidance of wetland areas. A detailed list of the BMPs that would be implemented for the proposed project is provided in the Avoidance and Minimization Measures section of this document. Based on the information, it has been determined that the exposure to increased human and construction activity would be discountable and would have insignificant effects on the Mariana common moorhen.

**Mariana Fruit Bat – Assessment of Potential Effects**

The Mariana fruit bat is not anticipated to use habitat at or near the proposed project site. Therefore, impacts to Mariana fruit bat are not anticipated. To insure impacts do not occur BMPs have been developed as a precautionary measure. BMPs include performing daily surveys, prior to the commencement of work, to insure Mariana fruit bat are not within the work zone; work stoppage upon observing Mariana fruit bat within the proposed project area, allowing it to leave on its own; limiting activity beyond the work zone; avoiding night work to the extent practical; minimizing vegetation clearing; and performing focused bat surveys prior to vegetation clearing. A detailed list of the BMPs that would be implemented for the proposed project is provided in the Avoidance and Minimization Measures section of this document. Based on this information, it has been determined that the proposed project will have no effect on Mariana fruit bat.

**Pacific Tree Snail – Assessment of Potential Effects**

Suitable habitat for Pacific tree snail is present within the vicinity of the proposed project. Vegetation clearing and grading for the proposed project could affect Pacific tree snail and tree snail habitat. However, BMPs have been developed to avoid and minimize impacts to Pacific tree snail and tree snail habitat. BMPs include performing daily surveys, prior to the commencement of work, to insure Pacific tree snail are not within the work zone; work stoppage upon observing Pacific tree snail within the proposed project area, allowing it to leave on its own; limiting activity beyond the work zone; minimizing vegetation clearing; performing focused bat surveys prior to vegetation clearing; and restoration of disturbed areas with native plant as soon as possible. Based on this information, it has been determined that the proposed project would have insignificant effects on Pacific tree snail.

**Green Sea Turtle and Hawksbill Sea Turtle – Assessment of Potential Effects**

Foraging habitat for the green sea turtle and hawksbill sea turtle occurs within the vicinity of the proposed project. While known turtle nesting areas are not present at the project site and turtle nesting is not anticipated, there is potentially suitable nesting habitat in the vicinity of the project area. Therefore, the green sea turtle and hawksbill sea turtle could be impacted by various components of the proposed project. The following paragraphs describe the potential effects the proposed project may have on green sea turtle and the hawksbill sea turtle.

Direct Physical Impact

The proposed project includes the use of heavy equipment such as cranes, saws, backhoes and jackhammers to demolish the existing bridge and construct the replacement bridge. These activities have the potential to directly strike green and hawksbill sea turtles should the animals be present during the placement of riprap or if debris were to accidentally fall into the water. Potential injuries and their severity would depend on the animal's proximity to the falling material or debris, but may include cuts bruises, broken bones, cracked or crushed carapaces, and amputations, any of which could result in the animal's death.

Marine animals will likely avoid the project areas on their own due to the on-going activities. In addition, BMPs have been developed to avoid and/or minimize the potential impacts to sea turtles. Some of the BMPs that would be implemented for the proposed project include performing daily surveys, prior to the commencement of work, to insure sea turtles are not within the work zone; work stoppage upon observing a sea turtle within the proposed project area, allowing it to leave on its own; limiting activity beyond the work zone; insuring all objects that are to be placed in the river, are lowered to the bottom in a controlled manner; and use of catchment platforms and protective netting to keep debris from falling into the water. A detailed list of the BMPs that would be implemented for the proposed project is provided in the Avoidance and Minimization Measures section of this document. Based on the information, it has been determined that direct physical impact to sea turtles is extremely unlikely and would be discountable.

Loss of Foraging Habitat

The Achang Reef Flat Marine Preserve provides foraging habitat for the green sea turtle and the hawksbill sea turtle. This foraging habitat could be degraded or temporarily impacted by various activities associated with the proposed project. Grading and excavating would be the primary activities that could potentially contribute to the degradation or temporary loss of foraging habitat. The release of sediment into Achang Reef Flat Marine Preserve could occur as the existing abutment walls are demolished and removed, soil behind the existing abutment walls is removed, and new grouted riprap is installed. The sediment released into the Ajayan River could migrate downstream to the Achang Reef Flat Marine Preserve where it would likely disperse and settle on the ocean floor and/or remain suspended in the ocean water. This increase in suspended sediment and sediment deposition within Achang Reef Flat Marine Preserve could damage and /or kill potential food sources for the sea turtles, such as seagrass beds and coral reef communities. Temporary increases in turbidity may also impact habitat quality for foraging sea turtles. However, BMPs have been developed to avoid and minimize impacts to sea turtle foraging habitat as a result of soil erosion, turbidity and/or sediment deposition within the Ajayan River, Ajayan Bay and Achang Reef Flat Marine Preserve. A detailed list of the BMPs that would be implemented for the proposed project is provided in the Avoidance and Minimization Measures section of this document. Based on this information, it has been determined that the loss of potential foraging habitat due to the release of sediment would be discountable and would have insignificant effects on the green and hawksbill sea turtle.

Exposure to Elevated Noise Levels

Several studies have shown that various anthropogenic activities can generate underwater noise levels that can be detected by a marine species within the range of the particular source. Depending on the species and underwater noise frequency, the underwater noise frequency can induce behavioral responses that are potentially damaging to that species. Construction projects adjacent to, and within the ocean is one of the many activities that can produce underwater sound to a level that it causes an adverse impact upon a marine species. Pile driving, such as that employed for this project, is often the construction activity that produces underwater noise frequencies that are potentially harmful to marine species.

Sea turtle hearing research is limited, but available information about sea turtle sensory biology suggests that they are low frequency specialists, with green sea turtles thought to be most acoustically sensitive between 200 and 700 hertz (Hz)[12]. Because the hearing range of green sea turtles overlaps with the expected frequency range of the pile driving signals, NMFS considers it likely that green sea turtles can hear and respond to pile driving noise. Currently, no acoustic thresholds have been established for sea turtles. However, existing research into sea turtle sensory biology suggests that sea turtles are less acoustically sensitive than cetaceans, relying more heavily on visual cues, rather than auditory input[13&14]. Therefore, application of the marine mammal thresholds would be conservative for sea turtles.

Underwater sound pressure levels are often measured and described in terms of the logarithmic decibel (dB) referenced to a baseline of 1 micropascal (re 1 μPa). To assess the potential impacts of an underwater sound on marine resources, NMFS often assesses impacts based on to root-mean-square ($dB_{rms}$) of an acoustic pulse. This is the portion of the pulse that contains 90% of the sound pressure.

The current acoustic thresholds used by NMFS for marine mammal Permanent Threshold Shift due to exposure to in-water sounds are ≥ 180 dB and ≥ 190 dB for cetaceans and pinnipeds, respectively. Exposure to impulsive in-water sounds at ≥ 160 dB is the threshold onset of Temporary Threshold Shift and behavioral disturbance for all marine mammals. NMFS considers these to be the thresholds for the onset of adverse effects due to acoustic exposures[15].

An underwater noise analysis was not conducted for the proposed project. Site-specific noise measurements for pile-driving at the Ajayan River are not available. California Department of Transportation's (CALTRANS)
Compendium of Pile Driving Sound Data (Compendium)[16] was referenced for reporting sound levels that would closely approximate sound levels for similar piles, driven in a similar manner as this action.

The proposed construction of the Ajayan Bridge would not require in-water pile driving. A total of twenty-four octagonal 16.5-inch-diameter concrete piles would be installed on the shoreline above the MHW line. Piles would be installed with an impact hammer, which would generate impulsive in-water sounds.

The CALTRANS Compendium reports measured levels for the driving of 16-inch-diameter concrete piles in water and 24-inch-diameter octagonal piles on land. Impact driving of 16-inch-diameter concrete piles in a water depth of 10 meters measured 173 $dB_{rms}$ at a distance of 10 meters from the source. Impact driving of 24-inch-diameter octagonal piles on land measured 181 $dB_{rms}$ at a distance of 10 meters from the source[9].

In the absence of site specific transmission loss data, the practical spreading loss equation, RL = SL – 15LogR, is often used to estimate the RL for actions in shallow nearshore marine waters (RL = received level; SL = source level; and R = range in meters (m)). This equation and the received levels reported in the Compendium as measured at 10 meters for the 24-inch-diameter octagonal concrete piles on land and 10 meters for 16-inch-diameter concrete pile in water was used to calculate the following source levels and isopleth ranges (Table 1).

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12 Ridgway, S. H., E.G. Wever, J.G. McCormick, J. Palin, and J.H. Anderson. 1969. Hearing in the Giant Sea Turtle, *Chelonia mydas*. PNAS, 64, 884-890.

13 Hazel, J., I.R. Lawler, H. Marsh, and S. Robson. 2007. Vessel speed increases collision risk for the green turtle *Chelonia mydas*. Endangered Species Research 3: 105-113.

14 Ridgway, S. H., E.G. Wever, J.G. McCormick, J. Palin, and J.H. Anderson. 1969. Hearing in the Giant Sea Turtle, *Chelonia mydas*. PNAS, 64, 884-890.

15 National Marine Fisheries Service, Pacific Islands Region, Protected Resources Division. 2014. ESA – Section 7 Consultation, Biological Opinion, United States Department of the Navy, X-Ray Wharf Improvements, Naval Base Guam – NMFS File No. (PCTS): PRI-2013-9309, PIRO Reference No.: I-PI-13-1105-LVA

16 California Department of Transportation (CALTRANS), 2007. Compendium of Pile Driving Sound Data. Prepared by Illinworth & Rodkin, 505 Petaluma Blvd. South, Petaluma, CA 94952. September 27, 2007.

| Table 2. Estimated source levels and ranges to effect threshold isopleths for similar pile driving actions | | | | | |
|---|---|---|---|---|---|
| **Piling** | **Driver** | **Water Depth** | **Source Level** | **Range to 180 $dB_{rms}$** | **Range to 160 $dB_{rms}$** |
| 24" Concrete | Impact | Land | 196 | 12 meters | 251 meters |
| 16" Concrete | Impact | 10 meters | 188 | 3 meters | 74 meters |

The proposed 16.5-inch-diameter concrete piles for the Ajayan Bridge replacement would generate lower sound levels in-water and smaller effect threshold isopleths than the similar pile driving actions presented in Table 1. Considering the relatively low number of sea turtles expected to occur within the project area, relatively minimal proposed pile driving, expected short-range of low sound levels that can cause behavioral disturbance, and 50-yard (46-meter) shut-down safety range, it is unlikely any sea turtles would be exposed to adverse sound levels produced by pile driving. Based on this information, it has been determined that elevated noise levels due to the pile driving activities would be discountable and would have insignificant effects on the green and hawksbill sea turtles.

Construction Lighting Impacts

Sea turtle hatchlings emerge from their nest at night and haul themselves towards the ocean where they will spend their entire life. Upon emerging from the nest, hatchlings typically orient themselves toward the brightest direction, which on natural, undeveloped beaches is commonly toward the open horizon of the ocean. However, on developed beaches, the brightest direction is often away from the ocean and toward the lighted structures located along the nesting beach habitat. Therefore, sea turtle hatchlings are often disoriented and unable to find the ocean, which often leads to high mortality rates[17]. In addition, artificial lighting may deter the adult female sea turtle from emerging from the ocean to excavate a nest and lay her clutch of eggs.

Although unlikely, construction of the proposed project may require work after daylight hours; thereby, facilitating the need to use artificial lighting to illuminate the proposed project area. Therefore, the use of artificial lighting after daylight hours could contribute to disorienting sea turtle hatchlings emerging from their nest and/or discourage an adult female sea turtle from emerging from the ocean to excavate a nest and deposit her clutch of eggs. However, if work is required after daylight hours, the potential impact to sea turtles due to artificial lighting would be minimized by the use of sea turtle friendly lighting; thereby, reducing emitted light from the proposed project area. Based on this information, it has been determined that the exposure to construction lighting would be discountable and would have insignificant effects on the green and hawksbill sea turtles.

Increased Exposure to Human Interaction

During project construction, there would be an increased presence of human activity that may result in higher incidents of sea turtle and human interaction. The impacts to sea turtles from human interaction would primarily be associated with behavioral changes in the sea turtles that may include avoiding potentially suitable foraging habitat within the Achang Reef Flat Marine Preserve, abrupt body movements while swimming that could cause injury to the sea turtle and may even result in prolonged inactivity at the bottom of the ocean floor[4]. It is unlikely that the increased human presence at the proposed project site would impact sea turtle nesting behavior given that the closest known nesting site is located approximately one mile (1.6 kilometers) to the northeast of the proposed project site. However, BMPs have been developed to avoid and/or minimize the potential impacts to sea turtles from human interaction. Some of the BMPs that would be implemented for the proposed project include performing daily surveys, prior to the commencement of work, to insure sea turtles are not within the work zone; work stoppage upon observing a sea turtle within the proposed project area, allowing it to leave on its own; and limiting activity beyond the work zone. A detailed list of the BMPs that would be implemented for the proposed project is provided in the Avoidance and

17 National Marine Fisheries Service and U.S. Fish and Wildlife Service. 1998. Recovery Plan for U.S. Pacific Population of the Green Turtle (*Chelonia mydas*). National Marine Fisheries Service. Silver Spring, MD.

Minimization Measures section of this document. Based on the information, it has been determined that the exposure to increased human activity would be discountable and would have insignificant effects on the green and hawksbill sea turtles.

Exposure to Elevated Turbidity

Given that sea turtles breathe air instead of water, increased turbidity should not adversely affect their respiration or other biological functions. Although these animals may be found in turbid waters, it is likely that they may avoid dense turbidity plumes in favor of clearer water. However, BMPs have been developed to avoid and minimize elevated turbidity including use of turbidity curtains and erosion and sediment controls. Based on this information, it has been determined that exposure to any plumes of elevated turbidity related to actions of the project will be non-injurious and will result in insignificant effects to green and hawksbill sea turtles.

Exposure to Waste and Discharges

Construction wastes may include plastic trash and bags that may be ingested and cause digestive blockage or suffocation. Large plastic trash and discarded sections of ropes and lines may entangle marine life. Equipment spills and discharges could include hydrocarbon-based chemicals such as fuel oils, gasoline, lubricants, hydraulic fluids and other toxicants, which could expose protected species to toxic chemicals. Depending on the chemicals and their concentration, exposure could result in a range of effects, from avoidance of an area to mortality. Local and federal regulations prohibit the intentional discharge of toxic wastes and plastics into the marine environment. In addition, BMPs have been developed to prevent the introduction of wastes and toxicants in the marine environment. Some of the BMPs that would be implemented for the proposed project include use of catchment platforms and protective netting to keep debris from falling into the water; off-site fueling to the extent feasible; storing and staging of construction materials away from the shoreline and river bank; inspection of equipment; readily available spill kits and absorbent pads; and immediate removal of construction debris from the site. A detailed list of the BMPs that would be implemented for the proposed project is provided in the Avoidance and Minimization Measures section of this document. Based on the information, it has been determined that discharges of wastes and toxicants are unlikely. Should a discharge occur appropriate measures would be in place to contain and clean-up the spill. Therefore, based on this information, it has been determined that the exposure to wastes and discharges would be discountable and would have insignificant effects on the green and hawksbill sea turtles.

**Locally Endangered Native Skinks – Assessment of Potential Effects**

Suitable habitat for native skinks is present within the vicinity of the proposed project. Vegetation clearing and grading for the proposed project could affect native skinks and skink habitat. However, BMPs have been developed to avoid and minimize impacts to native skinks and skink habitat. BMPs include performing daily surveys, prior to the commencement of work, to insure native skinks are not within the work zone; work stoppage upon observing native skink within the proposed project area, allowing it to leave on its own; limiting activity beyond the work zone; minimizing vegetation clearing; performing focused skink surveys prior to vegetation clearing; and restoration of disturbed areas with native plant as soon as possible. Based on this information, it has been determined that the proposed project would have insignificant effects on locally endangered native skinks.

**Avoidance and Minimization Measures**

To avoid and minimize the potential impacts the proposed project may have upon the federally threatened green sea turtle, federally endangered hawksbill sea turtle and other biological and environmental resource, the FHWA and the DPW have developed numerous BMPs in that would be implemented during the life of the proposed project. The BMPs to be implemented and maintained for the proposed project would include, but not limited to, the following:

- The contractor shall remain vigilant for the presence of federally and locally protected species (e.g., Endangered Species Act [ESA], Marine Mammal Protection Act [MMPA], Migratory Bird Treaty Act [MBTA], Guam Comprehensive Wildlife Conservation Strategy) during construction. A

qualified biologist will survey the areas adjacent to the proposed action for federally and locally protected species prior to the start of work each day and prior to resumption of work following any break of more than 30 minutes.

- Should protected species be discovered within 50 yards of the proposed work activities with the potential to impact or disturb species shall be postponed or halted. Work shall only begin/resume after the animals have voluntarily departed the area.

- Special attention shall be given to verify that no protected marine animals are in the area where equipment or materials are expected to contact the substrate before that equipment may enter the water.

- All objects that are to be placed in the river, such as turbidity curtains, riprap, and excavator bucket, shall be lowered to the bottom in a controlled manner. This can include the use of cranes, winches, or other equipment that affect positive control over the rate of decent to minimize turbidity potential.

- No marine vessels, boats, mooring lines or marker buoys shall be utilized.

- Turbidity curtains and tethers shall be minimum length necessary, and shall remain deployed only as long as needed to properly accomplish the required task.

- Deployment sites shall be devoid of live corals, seagrass beds, or other significant resources.

- Work shall be performed during daylight hours to avoid disorienting nesting sea turtles due to nighttime construction lighting. If work is required after daylight working hours, sea-turtle-friendly lighting shall be used to reduce the brightness of the emitted light.

- From September through April, migratory birds protected under the Migratory Bird Treaty Act of 1917, may use the project site as a foraging, nesting, and resting ground. The protected species must not be harmed or harassed.

- Vegetation (habitat) clearing shall be minimized to the maximum extent possible.

- The contractor must consult with the Guam Division of Aquatic and Wildlife Resources at least 1 week prior to any vegetation removal action.

- Focused bird, tree snail, bat and native skink surveys shall be performed prior to vegetation removal.

- Activities that result in sediment/pollutant discharges shall cease during the 21 day spawning moratorium for the primary hard coral spawning event each year. For the 2014 scleractinian coral spawning period, these activities shall stop by July 11, 2014 and activities may resume on August 1, 2014.
- The Ajayan Bridge is located in the Achang Reef Flat Marine Protected Area (MPA). No take of marine organisms is allowed within this MPA. Any take to include killing, damaging, or wounding of marine organisms is a violation of local natural resource laws.

- Wetlands will be designated as Environmentally Sensitive Areas where no construction activities, equipment, or personnel are allowed.

- Appropriate materials to contain and clean potential spills shall be stored at the work site and be readily available. All project-related materials and equipment placed in the water shall be free of pollutants.

- The contractor shall perform daily pre-work equipment inspections for cleanliness and leaks. Heavy equipment operations shall be postponed or halted should a leak be detected, and shall not proceed until the leak is repaired and equipment cleaned.

- Off-site fueling sites shall be used to the maximum extent practical. Should fueling of project-related vehicles or equipment need to occur on-site a designated fueling area will be established at least 50 feet from the shoreline, river bank and wetlands. Project personnel shall be trained on proper fueling and fuel spill cleanup procedures.

- Stockpile, staging, and material storage areas shall be kept at least 50 feet from the shoreline, river bank, and wetlands.

- The contractor shall take appropriate precautions in advance of predicted typhoon events to prevent material losses during surge or flood events, such as relocating materials and equipment to be at least 50 feet from the shoreline and river bank.

- Hazardous materials and petroleum products shall be transported, used, and stored on-site in a manner to prevent contamination of soils and water.

- Spill kits including absorbent pads and other materials shall be readily available on-site.

- Turbidity and siltation from project-related work shall be minimized and contained through the appropriate use of erosion-control practices and effective silt containment devices (e.g., silt fencing and turbidity curtains), and the curtailment of work during adverse weather and tidal/flow conditions.

- An Environmental Protection Plan, Erosion Control Plan, Storm Water Pollution Prevention Plan, litter-control plan, Hazard Analysis and Critical Control Point Plan, and project-specific plans shall be prepared, approved by appropriate regulatory agencies, and implemented.

- Solid and sanitary waste disposal procedures and facilities shall be implemented.

- Erosion-control device(s) shall be employed at the job site to prevent debris and soil from entering the river. Device(s) must be secured and able to withstand heavy rains and winds.

- Catchment platforms and protective netting shall be installed under the bridge to keep debris from falling into the water.

- Construction debris must be removed immediately and not stored at the job site. Debris includes excavated soil, cement material, piping, and asphalt.

- Any material or debris removed from the aquatic environment shall be disposed of at upland sites in accordance with applicable laws and regulations.

- Dust-control devices or methodologies (wetting) must be employed at the job site during construction.

- Absorbent pads shall be readily available at the job site during heavy equipment operations, and equipment must be inspected for leaks prior to use.

- Work shall be conducted below the mean high water line during the dry season and low tides when feasible.

- All heavy equipment shall be kept out of the stream bed and disturbance of the existing stream bed shall be avoided.
- Impacts to strand vegetation along the shoreline shall be avoided to minimize beach erosion. Vegetation shall be replaced as soon as possible along both stream banks and shorelines.
- "Soft" approaches in lieu of impervious "hard" stabilization and modifications shall be used whenever possible to slow stream flow and allow for water infiltration.
- Hydrodynamics and sedimentation patterns shall be properly modeled and designed to avoid erosion to adjacent properties when "hard" stabilization is deemed necessary.
- The Nypa palm community upstream of the bridge shall be avoided.
- River corridor access shall be maintained for aquatic species.
- Disturbed areas will be restored with native plants as soon as possible.
- Invasive species controls shall be maintained to ensure that all materials (human-created and natural) transported from off-site are free of such species (e.g., brown tree snake, rhino beetle, invasive plants).

We trust that we have provided you with the necessary information to evaluate the proposed project and potential effects to species protected under Guam Endangered Species Regulation No. 9. We appreciate any feedback or comments you may have regarding the project, avoidance and minimization measures, and potential effects to protected resources.

Should you require additional information, feel free to contact Joaquin Blaz at (671) 649-3128.

Sincerely,

**Carl V. Dominguez**
**Director**

Enclosure:
1 – Project Location Map
2 – Photo Log
3 – Proposed Geotechnical Soil Boring Locations
4 – Bridge Profile
5 – Traffic Control Plans
6 – BMP Drawings
7 – Achang Reef Flat Marine Preserve
8 – January 2013 Response from DAWR
9 – Flora and Fauna Surveys for the Ajayan Bridge Replacement Project

cc:
Richelle M. Takara, FHWA (via email)
Joaquin Blaz, DPW (via email)
Brent Tibbatts, DAWR (via email)
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**G. 2 Government of Guam, Bureau of Statistics and Plans, Coastal Management Program**

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May 14, 2014

Evangeline D. Lujan
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Bureau of Statistics & Plans
P.O. Box 2950
Hagatna, Guam 96932

**Subject: Ajayan Bridge Replacement Project, Guam Coastal Management Program**

Dear Ms. Evangeline Lujan:

The U.S. Department of Transportation, Federal Highway Administration (FHWA), in coordination with the Guam Department of Public Works (DPW), proposes to replace the existing Ajayan River Bridge located on Route 4, on the boundary between Merizo and Inarajan. A Categorical Exclusion document for compliance with the National Environmental Policy Act (NEPA) is being prepared for the Route 4 Ajayan Bridge Replacement Project (project).

On behalf of FHWA and DPW, we are contacting you to initiate project scoping and solicit your comments regarding issues or concerns relevant to your agency's programs and policies.

**Ajayan Bridge Existing Condition**

The Ajayan Bridge is located on Route 4 on the boundary between Merizo and Inarajan. The bridge provides two lanes that cross the Ajayan River just upstream of the river mouth as it enters the ocean, as shown in Enclosure 1 – Project Location Map.

The existing single-span cast-in-place concrete box girder bridge was constructed in 1968, with a span length of approximately 76.2 feet and a skew of 40 degrees. Abutments are founded on concrete piles; the deck has an asphalt concrete wearing surface. The most recent bridge inspection report, dated May 27, 2004, noted that the substructure and channel are rated in serious condition. The damage noted includes cracking and differential movement of substructure units and significant scour at abutments, as shown in Enclosure 2 – Photo Log.

**Project Description**

The existing bridge will be demolished and replaced with a new 40-foot-wide by 105-foot-long bridge. The proposed improvements include two 12-foot-wide lanes and two 8-foot-wide paved shoulders. Roadway alignment and grade will match the existing at the point of tie-in.

To accommodate traffic while the new bridge is being constructed, the bridge will be demolished in two phases, demolishing one side (longitudinally) of the bridge at a time. This will allow two-way traffic (one lane, controlled by traffic lights) to use the bridge during demolition and construction.

The project will entail the demolition and removal of the existing bridge structure and existing pile caps. The existing piles below the waterline will be cut and capped at the mudline, but left in-place. This will provide for

minimal disturbance of the aquatic ecosystem. Roadway work within the project limits will include removal of the existing pavement, full-depth pavement replacement, and replacement of the guardrails. The proposed action will also include geotechnical sampling, testing, and analysis. As shown in Enclosure 3 – Proposed Geotechnical Soil Boring Locations, soil borings for bridge foundations will be taken at two locations, one at each proposed substructure unit, to a depth of at least 100 feet or at least 10 feet into competent bedrock, whichever is shallower. Additionally, two shallow borings to a depth of 15 feet will be taken within the roadway approach area.

**Demolition and Construction Methods**

Demolition

Bridge demolition will include removal of the existing bridge deck, box beam, abutments, wing walls, guardrails, and parapet. The existing bridge is approximately 29.6 feet wide and will be demolished in two phases to allow for one lane to remain open for traffic. Phase 1 will include saw-cutting the westbound portion of the existing bridge and removing it by crane. Phase 2 will include the same actions to the eastbound portion of the existing bridge. Before demolition and removal, a temporary concrete barrier will be installed on the existing bridge, and existing utilities will be temporarily relocated to the opposite portion of the bridge during each phase.

Demolition of the existing abutment walls will be accomplished by use of jackhammers and/or hoe rams, and removed via mechanical equipment such as a backhoe. The existing bridge abutments will be demolished and the existing piles will be cut down to the river bed. The soil between the old abutment and new abutment will be excavated, and 48-inch-thick grouted riprap will be placed on a gradual slope from the new abutment to the remaining old pilings, as shown in Enclosure 4 – Bridge Profile. A combined total of approximately 540 cubic yards of soil and concrete abutment wall material will be excavated from below the mean high water (MHW) line of the Ajayan River. The combined total linear disturbance to the stream channel from the excavation of the soil and concrete abutment wall material will be approximately 407 linear feet.

Construction

Construction of the new bridge will also be performed in two phases so that two-way signal-controlled traffic can be maintained in one lane during construction. Phase 1 will include demolition of the existing westbound portion of the bridge and construction of the new westbound portion of the bridge. During Phase 1, utilities and two-way signal-controlled traffic will be temporarily relocated to the eastbound portion of the existing bridge. Phase 2 will include demolition of the existing eastbound portion of the bridge and construction of the new eastbound portion of the bridge. During Phase 2, utilities will be permanently installed in the westbound portion of the new bridge, and two-way signal-controlled traffic will be temporarily relocated to the westbound portion of the new bridge. Work areas for Phase 1 and Phase 2 are shown in Enclosure 5 – Traffic Control Plans.

New bridge foundations will be constructed inland, or behind, the existing abutments to minimize disturbance to the river channel. The proposed abutments will be set back from the existing abutments. The soil and grouted riprap between the remaining existing piles and the new abutment will be sloped back at a 3H:1V ratio. The two new abutments will be constructed at the top of the slope and supported by twelve piles (per abutment), for a combined total of twenty-four new octagonal 16.5-inch-diameter concrete piles (100 tons per pile). The new abutments and abutment piles will be constructed above the MHW line.

Approximately 947 cubic yards of grouted stone riprap will be placed along the abutment walls, below the MHW line, to protect the abutment from erosion caused by waves. The riprap (fill material) will be placed along approximately 401 linear feet of stream channel. The riprap will be placed within the excavation footprint and will not impact additional areas of the stream channel.

Best Management Practices

Best management practices (BMPs) will include catchment platforms and protective netting, silt screen fences, and turbidity curtains. Catchment platforms and protective netting will be installed under the bridge to keep debris from falling into the water. Silt screen fences will be placed at the slope toe around the river edges to prevent erosion and rubbish from going into the water. Turbidity curtains will be installed at both river banks surrounding the work areas to prevent the spread of silt and sediment into the river and bay (see Enclosure 6 – BMP Drawings).

**Natural Environments**

The proposed project is located within the southern end of Guam, which is characterized by hilly volcanic slopes descending from approximately 800 feet in elevation to sea level over distances of less than 2.5 miles. The project site is situated between the Inarajan and Manell watersheds. The Ajayan Bridge is situated on the southern end of the Ajayan River, adjacent to the Ajayan Bay discharge point. Flora and fauna surveys of the proposed project area were conducted by SWCA Environmental Consultants (SWCA) on November 6 and 7, 2013 (Enclosure 7 – Flora and Fauna Surveys for the Ajayan Bridge Replacement Project). During these surveys, emphasis was placed on identifying special-status species. The following paragraphs describe the existing terrestrial and aquatic environments that occur within the proposed project area as reported by SWCA and Guam Department of Agriculture, Division of Aquatic and Wildlife Resources (DAWR).

Terrestrial Ecology

Forest surrounding the project area consists mostly of secondary thicket/scrub forest with some ravine forest. Areas of forested palustrine wetlands are located along the east and west banks of the Ajayan River. Several typhoons that occurred between the 1970s and 1990s changed the vegetation in the area dramatically. Site visits conducted by Guam DAWR staff in February and March 2013 found that pago (*Hibiscus tiliaceus*) and tangantangan (*Leucaena leucocephala*) were the two common species in the project area.

During flora surveys performed by SWCA on November 6 and 7, 2013, a total of 19 plants were identified to either genera or species. The seven native plants documented consisted of five trees (pago, *Pandanus tectorius*, *Bougainvillea glabra*, *Callicarpa candicans*, and *Morinda citrifolia*), one fern (*Polypodium scolopendria*), and one grass (*Saccharum spontaneum*). The non-native plants documented were pugua (*Areca catechu*), coconut trees (*Cocos nucifera*), beggar's tick (*Bidens alba*), Siam weed (*Chromolaena odorata*), mile-a-minute vine (*Mikania scanden*), daok (*Calophyllum inophyllum*), papaya (*Carica papaya*), tangantangan, kamachile (*Pithecellobium dulce*), and *Musa* sp.

Shoreline Ecology

The project area is located at the mouth of the Ajayan River as it discharges into Achang Reef Flat. The shoreline vegetation is composed primarily of coconut trees, pago, and tangantangan.

Although not located within the boundaries of the project area, a small Nypa palm (*Nypa fruticans*) (also referred to as "Nipa") community was identified approximately 10 meters upstream of the Ajayan River. This species is a wetland obligate and grows in brackish marshes.

Aquatic Ecology

The Ajayan River flows south and discharges at the Ajayan Bay. The Ajayan Bay includes the eastern portion of the Achang Reef Flat Marine Preserve, as shown in Enclosure 8 – Achang Reef Flat Marine Preserve. The Ajayan River channel cuts completely through the reef flat at Ajayan Bay. The reef flat consists of inner and outer reef flats that are exposed at low tide. Mangroves and sea grass beds are present in the vicinity of the project site.

According to the University of Guam Marine Laboratory's Guam Coastal Atlas[1] the benthic habitat of the river channel is composed of "sand, uncolonized 90% to 100%", extending from inland waters to 500 meters offshore. The benthic habitat to the east of the channel is composed of "spur and groove, coral 10% to <50%" near the shore, and "pavement, turf 50% to <90%" after approximately 100 meters offshore. The benthic habitat to the west of the channel is composed of "spur and groove, coral 50% to <90%" near the shore, and "pavement, coral 10% to <50%" after approximately 50 meters offshore.

The Achang Reef Flat supports primarily hard corals. Only two soft coral species have been identified by the University of Guam Marine Lab during monitoring of the site.

Achang Reef Flat is classified as M-1, Excellent.[2] Waters in this category are suitable for whole-body contact and recreation. These waters are also needed for research and to ensure the preservation and protection of marine life, including coral, reef-dwelling organisms, fish, and related resources, and aesthetic enjoyment. The surface waters of the Ajayan River are classified as S-3, Low. Waters in this category are used primarily for commercial, agriculture, or industrial activity. Aesthetic enjoyment and recreational body contact are limited. Maintenance of aquatic life is also limited.

**Agency Coordination**

Other Guam and federal agencies have been contacted for consultation. Below is a synopsis of the other agency consultations for this project to-date.

Site specific species and habitat information has been provided by Guam Department of Agriculture, Division of Aquatic and Wildlife Resources (DAWR), U.S. Fish and Wildlife Service (USWFS), and National Marine Fisheries Service (NMFS). As requested by the various agencies, flora and fauna surveys were completed for this project. Additional BMPs and avoidance and minimization measure will be implemented based on recommendations from agency consultation. Determinations of species and habitat effects will be made in coordination with resource agencies.

Consultation with the Government of Guam, State Historic Preservation Office (SHPO) has been initiated and SHPO has accepted the Final Archaeological Monitoring and Data Recovery Plan for this project.

The U.S. Army Corps of Engineers (ACOE) has determined tidal waters of Ajayan Bay of the Pacific Ocean are navigable water of the U.S. under ACOE jurisdiction. The ACOE has confirmed the discharge of dredged and fill material associated with this bridge replacement project will require authorization from the ACOE, under Section 404 of the Clean Water Act.

The U.S. Coast Guard (USCG) has confirmed the Ajayan River is tidally influenced and subject to USCG jurisdiction. The USCG had determined the project location is in the USCG advance approval category for permitting the construction of the bridges, pursuant to 33 CFR 115.70. Therefore, a specific USCG bridge permit will not be required for this project.

Consultation has also been initiated with Government of Guam, Department of Land Management (DLM) and the Guam Seashore Protection Commission (within DLM).

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[1] University of Guam Marine Laboratory's Guam Coastal Atlas. Online at www.guammarinelab.com/coastal.atlas/htm/Maps.htm.

[2] Guam Environmental Protection Agency. 2001. Guam Water Quality Standard. 2001 Revision.

Upon completion of the Categorical Exclusion an Assessment of Federal Consistency with the Coastal Zone Management Act will be prepared and submitted to your office for concurrence. We respectfully request your review of the project information provided and comment on any Coastal Management Program objectives and policies that may affect this undertaking. Should you have any questions or need additional information please contact George Redpath at george.redpath@aecom.com or at (808) 954-4525.

Sincerely,

George Redpath
Senior Project Manager

Enclosures:
1 – Project Location Map
2 – Photo Log
3 – Proposed Geotechnical Soil Boring Locations
4 – Bridge Profile
5 – Traffic Control Plans
6 – BMP Drawings
7 – Flora and Fauna Surveys for the Ajayan Bridge Replacement Project
8 – Achang Reef Flat Marine Preserve

cc:
Joanne M.S. Brown, DPW (via email)
Joaquin Blaz, DPW (via email)
Jeff Wilson, Parsons Brinckerhoff (via email)
Nora Camacho, Parsons Brinckerhoff (via email)
Kosal Krishnan, AECOM (via email)
Nemencio Macario, N.C. Macario (via email)

**Eddie Baza Calvo**
Governor of Guam

**Ray Tenorio**
Lieutenant Governor

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**Lorilee T. Crisostomo**
Director

MAY 2 8 2014

Mr. George Redpath
AECOM Senior Project Manager
1001 Bishop Street, Suite 1600
Honolulu, HI 96813 USA

Hafa Adai Mr. Redpath:

This is in response to the scoping letter sent to the Bureau of Statistics and Plans by AECOM Environmental Planner, Courtney Krug, on your behalf, soliciting comments regarding the proposed Ajayan Bridge Replacement Project located on Route 4, on the boundary between Merizo and Inarajan, Guam.

As mentioned on your letter, a Categorical Exclusion document is being prepared for compliance with the National Environmental Policy Act (NEPA) for this project. However, please note that the NEPA document does not necessarily fulfill the requirements of the Coastal Zone Management Act, *15 CFR Part 930.37*. The submission of a corresponding Federal Consistency Assessment and Certification is needed for the project, certifying that the proposed Department of Public Works project is consistent with the federally approved development and resource policies of the Guam Coastal Management Program (GCMP). Please refer to the Bureau's ***Procedures Guide for Achieving Consistency with the Guam Coastal Management Program,*** under Category II- Activities Requiring Federal License or Permit, pages 13-16. The Guidebook can be accessed at the BSP Website: http://www.bsp.guam.gov.

Impacts of the projects on cultural, terrestrial and marine resources, as well as, endangered species must be assessed and/or evaluated. We suggest that the Department of Land Management, the Guam Department of Parks and Recreation's Historic Preservation Office, as well as, the Guam Environmental Protection Agency and the Department of Agriculture's Division of Aquatic and Wildlife Resources (DAWR) be consulted to obtain corresponding permits, certifications, clearance and/or waivers required prior to starting the construction project. We believed this proposed project would also require the U.S. Department of the Army Corps of Engineers (ACOE) Permit. The copy of the certification that the proposed activity complies with and will be conducted in a manner consistent with the enforceable policies of Guam approved management program and will be conducted in a manner consistent with such program shall be submitted to the ACOE Guam Regulatory Branch Manager, who will forward a copy of the public notice to the GCMP requesting concurrence or objection. The ACOE shall not issue the permit until the BSP/GCMP concurs with the certification statement or the Secretary of Commerce determines the project to be consistent for the purposes of CZM Act or is necessary in the interest of national security.

We recommend that the reconstruction of the roads and associated drainage improvements must be in adherence with the Guam Water Quality Standards administered and enforced by the Guam Environmental Protection Agency, as well as, the Erosion and Sediment Control Regulations of the Guam and CNMI Storm Water Management Manual. Additionally, the projected future traffic volumes/congestions issues from military buildup be addressed and done in concert with GPA, GWA, GTA, Docomo Pacific, Inc. and other utility agencies in Guam. Detailed assessment of impacts on the "environment" must incorporate mitigation/monitoring measures into the road and bridge design, including:

- Landscaping, migratory bird protection, watercourse and fisheries protection measures and other environmental protection measures. If culvert replacement/extension results to potential impacts such as "Harmful Alteration, Disruption or Destruction" of fish habitat appropriate mitigation measures must be implemented, subject to Department of Agriculture's Division of Aquatic and Wildlife Resources (DAWR).

- Emergency services access during construction must be provided to the public.

- Environmental Protection Plan (EPP) must be submitted to the Guam Environmental Protection Agency (GEPA) for approval under the Clean Water Act.

- Incorporate public and agency comments received during review period into Detailed Design, where possible.

- Recommendations from experienced bridge building engineers should be solicited, to determine if the existing bridge has to be replaced along approximately the same general alignment with the existing Route 4 right-of-way. If it has been determined that the Ajayan Bridge is in the National Register of Historic Place, architectural and landscaping characteristics relevant to its historic setting, such as lighting fixtures, detailed concrete elements, and ornamental fencing must be consistent with the characteristic of the bridges and the surrounding area. Design philosophy and elements of the approach must be discussed and incorporated into the final design. Various constraints have to be addressed, including sensitive wetlands area that could tolerate only minimal impact from the bridge configuration. Maintenance of traffic must be considered in the construction of roads and bridges. It is ideal to maintain two lanes of traffic for the duration of the project. Air quality impacts will be mitigated by applying standard dust and emission control measures during construction.

- Impacts of temporary road closures can be mitigated by:
    - minimizing length of time of road closures
    - providing newspaper notices on timing and duration of closures
    - installing information signs advising drivers of "exit" interchange closures and alternative routes

The Bureau defers the review and approval of the design plans and construction specifications to the Department of Public Works Engineers and/or their duly authorized technical building consultants. All construction projects must conform and adhere to all of the required Guam environmental rules and regulations, such as: implementation of stormwater and erosion control

measures to prevent degradation of water quality. Additionally, the bridge should be designed to withstand strong currents and seismic activities capable of producing earthquakes of Richter movement based on the implementation of Public Law 30-159 provisions of the 2009 International Building Code (IBC) and the adoption of the reference codes.

The assessment of the proposed project's conformance with the GCMP objectives, policies, and applicable management network rules and regulations must be submitted as part of the review of the Federal Consistency applications, in accordance with the provisions of the Coastal Zone Management Act (CZMA) Federal Consistency Regulations, 15 CFR Part 930.

Finally, please be reminded that Federal Consistency application must be directed to the Bureau's GCMP office and must bear the DPW Director's approval also indicating the name of the duly authorized/designated representative and/or consultant/contractor for the DPW's specific project, funded by the Federal Highway Administration (FHWA), as agreed upon during agency's meeting for the submission for review of Federal Consistency applications.

Sincerely,

LORILEE T. CRISOSTOMO
Director

cc: GEPA
DoAg
DPR/GHPO
DLM
DPW
NOAA/ Loerzel

## G.3 Government of Guam, Department of Land Management

# Correspondence Record

| Date | Subject | Attachment | | |
|---|---|---|---|---|
| March 28, 2012 | Ajayan Bridge Replacement Project | Yes | | |
| | | No | x | |

| Contacted By (Name/Title) | Contacted By (Agency) | Person Contacted (Name/Title) | Person Contacted (Agency) |
|---|---|---|---|
| Christopher Timko | AECOM Environment | Frank Taitano | Guam DLM |

**Ajayan Bridge Replacement Project and the Achang Marine Preserve**

Frank Taitano stated that the preserve only extends as far as the right-of-way for Route 4 or ten meters from shore. If the right-of-way is within the ten meters then the preserve stops at the right-of-way. He also recommended that a biologist be present during the construction to make sure that species in the rare estuarian environment be protected and he said that if the construction project does infringe upon the preserve at any time then there **must** be a biologist present. If the biologist calls for a halt to construction in order to protect wildlife then all construction will need to cease immediately. Construction will not continue until the biologist deems that the wildlife has been protected.

## G.4 Government of Guam, DLM, Guam Seashore Protection Commission

AECOM
1001 Bishop Street
Suite 1600
Honolulu, HI 96813
www.aecom.com

808 523 8874 tel
808 523 8950 fax

May 7, 2012

Monte Mafnas
Executive Secretary, Guam Seashore Protection Commission
c/o Department of Land Management
Government of Guam
P.O. Box 2950
Hagatna, Guam 96910

Subject: Request to Initiate Informal Wetlands / Seashore Reserve Permit Consultation for **Ajayan Bridge Replacement Project**, Guam

Dear Mr. Mafnas:

The U.S. Department of Transportation - Federal Highways Administration (FHWA), in coordination with the Guam Department of Public Works (DPW) proposes to replace the existing Ajayan River Bridge located on Route 4, on the boundary between Merizo and Inarajan. AECOM is contacting your agency on behalf of the DPW and FHWA. A Categorical Exclusion document for compliance with the National Environmental Policy Act (NEPA) will be prepared for the project.

**Ajayan Bridge Existing Condition**
The Ajayan River Bridge is located on Route 4 on the boundary between Merizo and Inarajan, as shown in Figure 1-1.

The existing single span cast-in-place concrete box girder bridge was constructed in 1968 with a span of approximately 76.2 feet and a skew of 40 degrees. Abutments are founded on concrete piles and the deck has an asphalt concrete wearing surface. The most recent bridge inspection report, dated May 27, 2004, noted that the substructure and channel are rated in serious condition with cracking and differential movement noted for substructure units and significant scour at abutments, as shown in the attached Photo Log. The channel alignment and waterway opening are also noted as deficient.

**Proposed Action**
The proposed action would replace the existing two-lane bridge across the Ajayan River just upstream of the river mouth as it enters the ocean. Bridge abutment slopes would be protected from erosion by placement of stone rip rap. There would be minimal roadway approach work. Proposed improvements include two 12-foot lanes with 8-foot paved shoulders. Roadway alignment and grade would match existing at points of tie-in. Roadway work within project limits would include removal of the existing pavement and design of full-depth pavement replacement and replacement of guardrail. The proposed action would include geotechnical sampling, testing, and analysis. As shown in Figure 1-2, soil borings for bridge foundations would be taken at two locations, one at each proposed substructure unit, to a depth of at least 100 feet or at least 10 feet into competent bedrock, whichever is shallower. Additionally, two shallow borings to a depth of 15 feet would be taken within the roadway approach area. All work would be conducted within existing right-of-way.

AECOM

A review of Guam Marine Preserves identified that the proposed action is adjacent to the Achang Reef Flat Marine Preserve, as shown in Figure 1-3. However, the marine preserve only extends as far as the road right-of-way; therefore, the proposed action would not encroach upon the preserve area.

The FHWA requests that you review the project information provided above to determine if there are any Guam Seashore Protection Commission issues that may be affected by this undertaking. Please feel free to contact me at 808.356.5394 (office), 808.223.9213 (cell), or via email at Jennifer.Scheffel@aecom.com.

Thank you for your attention to this project notification and any comments you may have.

Sincerely,

Jennifer M. Scheffel
Environmental Planner

Enclosures: Figure 1-1: Site Location Map
Figure 1-2: Geotechnical Soil Boring Locations
Figure 1-3: Achang Reef Flat Marine Preserve
Photo Log

cc: Joanne M. S. Brown, DPW
Ramon Padua, DPW
Joaquin Blaz, DPW
Paul Wolf, PB
Nora Camacho, PB
James Mischler, PB
Edgar Hipolito, AECOM
Kosal Krishnun, AECOM
Nemencio Macario, N.C. Macario & Associates, Inc.

## G.5 Government of Guam, Environmental Protection Agency

AECOM
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808 523 8874 tel
808 523 8950 fax

April 29, 2014

Eric M. Palacios
Administrator
Guam Environmental Protection Agency
P.O. Box 22439 GMF
Barrigada, Guam 96921

**Subject: Ajayan Bridge Replacement Project, Guam EPA Request for Consultation**

Dear Mr. Palacios:

The U.S. Department of Transportation, Federal Highway Administration (FHWA), in coordination with the Guam Department of Public Works (DPW), proposes to replace the existing Ajayan River Bridge located on Route 4, on the boundary between Merizo and Inarajan. A Categorical Exclusion document for compliance with the National Environmental Policy Act (NEPA) is being prepared for the Route 4 Ajayan Bridge Replacement Project (project).

We are contacting you to initiate consultation on behalf of FHWA and DPW.

## Ajayan Bridge Existing Condition

The Ajayan Bridge is located on Route 4 on the boundary between Merizo and Inarajan. The bridge provides two lanes that cross the Ajayan River just upstream of the river mouth as it enters the ocean, as shown in Enclosure A – Project Location Map.

The existing single-span cast-in-place concrete box girder bridge was constructed in 1968, with a span length of approximately 76.2 feet and a skew of 40 degrees. Abutments are founded on concrete piles; the deck has an asphalt concrete wearing surface. The most recent bridge inspection report, dated May 27, 2004, noted that the substructure and channel are rated in serious condition. The damage noted includes cracking and differential movement of substructure units and significant scour at abutments, as shown in Enclosure B – Photo Log.

## Project Description

The existing bridge will be demolished and replaced with a new 40-foot-wide by 105-foot-long bridge. The proposed improvements include two 12-foot-wide lanes and two 8-foot-wide paved shoulders. Roadway alignment and grade will match the existing at the point of tie-in.

To accommodate traffic while the new bridge is being constructed, the bridge will be demolished in two phases, demolishing one side (longitudinally) of the bridge at a time. This will allow two-way traffic (one lane, controlled by traffic lights) to use the bridge during demolition and construction.

The project will entail the demolition and removal of the existing bridge structure and existing pile caps. The existing piles below the waterline will be cut and capped at the mudline, but left in-place. This will provide for minimal disturbance of the aquatic ecosystem. Roadway work within the project limits will include removal of the existing pavement, full-depth pavement replacement, and replacement of the guardrails. The proposed action will also include geotechnical sampling, testing, and analysis. As shown in Enclosure C – Proposed Geotechnical Soil Boring Locations, soil borings for bridge foundations will be taken at two locations, one at each proposed substructure unit, to a depth of at least 100 feet or at least 10 feet into competent bedrock, whichever is shallower. Additionally, two shallow borings to a depth of 15 feet will be taken within the roadway approach area.

**Demolition and Construction Methods**

Demolition

Bridge demolition will include removal of the existing bridge deck, box beam, abutments, wing walls, guardrails, and parapet. The existing bridge is approximately 29.6 feet wide and will be demolished in two phases to allow for one lane to remain open for traffic. Phase 1 will include saw-cutting the westbound portion of the existing bridge and removing it by crane. Phase 2 will include the same actions to the eastbound portion of the existing bridge. Before demolition and removal, a temporary concrete barrier will be installed on the existing bridge, and existing utilities will be temporarily relocated to the opposite portion of the bridge during each phase.

Demolition of the existing abutment walls will be accomplished by use of jackhammers and/or hoe rams, and removed via mechanical equipment such as a backhoe. The existing bridge abutments will be demolished and the existing piles will be cut down to the river bed. The soil between the old abutment and new abutment will be excavated, and 48-inch-thick grouted riprap will be placed on a gradual slope from the new abutment to the remaining old pilings, as shown in Enclosure D – Bridge Profile. A combined total of approximately 540 cubic yards of soil and concrete abutment wall material will be excavated from below the mean high water (MHW) line of the Ajayan River. The combined total linear disturbance to the stream channel from the excavation of the soil and concrete abutment wall material will be approximately 407 linear feet.

Construction

Construction of the new bridge will also be performed in two phases so that two-way signal-controlled traffic can be maintained in one lane during construction. Phase 1 will include demolition of the existing westbound portion of the bridge and construction of the new westbound portion of the bridge. During Phase 1, utilities and two-way signal-controlled traffic will be temporarily relocated to the eastbound portion of the existing bridge. Phase 2 will include demolition of the existing eastbound portion of the bridge and construction of the new eastbound portion of the bridge. During Phase 2, utilities will be permanently installed in the westbound portion of the new bridge, and two-way signal-controlled traffic will be temporarily relocated to the westbound portion of the new bridge. Work areas for Phase 1 and Phase 2 are shown in Enclosure E – Traffic Control Plans.

New bridge foundations will be constructed inland, or behind, the existing abutments to minimize disturbance to the river channel. The proposed abutments will be set back from the existing abutments. The soil and grouted riprap between the remaining existing piles and the new abutment will be sloped back at a 3H:1V ratio. The two new abutments will be constructed at the top of the slope and supported by twelve piles (per abutment), for a combined total of twenty-

four new octagonal 16.5-inch-diameter concrete piles (100 tons per pile). The new abutments and abutment piles will be constructed above the MHW line.

Approximately 947 cubic yards of grouted stone riprap will be placed along the abutment walls, below the MHW line, to protect the abutment from erosion caused by waves. The riprap (fill material) will be placed along approximately 401 linear feet of stream channel. The riprap will be placed within the excavation footprint and will not impact additional areas of the stream channel.

Best Management Practices

Best management practices (BMPs) will include catchment platforms and protective netting, silt screen fences, and turbidity curtains. Catchment platforms and protective netting will be installed under the bridge to keep debris from falling into the water. Silt screen fences will be placed at the slope toe around the river edges to prevent erosion and rubbish from going into the water. Turbidity curtains will be installed at both river banks surrounding the work areas to prevent the spread of silt and sediment into the river and bay (see Enclosure F – BMP Drawings).

**Agency Coordination**

Other Guam and federal agencies have been contacted for consultation.

Site specific species and habitat information has been provided by Guam Department of Agriculture, Division of Aquatic and Wildlife Resources (DAWR), U.S. Fish and Wildlife Service (USWFS), and National Marine Fisheries Service (NMFS). As requested by the various agencies, flora and fauna surveys were completed for this project. Additional BMPs and avoidance and minimization measure will be implemented based on recommendations from agency consultation. Determinations of species and habitat effects will be made in coordination with resource agencies.

Consultation with the Government of Guam, State Historic Preservation Office (SHPO) has been initiated and SHPO has accepted the Final Archaeological Monitoring and Data Recovery Plan for this project.

The U.S. Army Corps of Engineers (ACOE) has determined tidal waters of Ajayan Bay of the Pacific Ocean are navigable water of the U.S. under ACOE jurisdiction. The ACOE has confirmed the discharge of dredged and fill material associated with this bridge replacement project will require authorization from the ACOE, under Section 404 of the Clean Water Act.

The U.S. Coast Guard (USCG) has confirmed the Ajayan River is tidally influenced and subject to USCG jurisdiction. The USCG had determined the project location is in the USCG advance approval category for permitting the construction of the bridges, pursuant to 33 CFR 115.70. Therefore, a specific USCG bridge permit will not be required for this project.

Consultation has also been initiated with Government of Guam, Department of Land Management (DLM) and DLM, Guam Seashore Protection Commission.

Thank you for your attention to this project notification and any comments you may have. The project team is available to meet with you to discuss this project in greater detail. Should you have any questions or comments based on the above proposed project specifics, please contact George Redpath at george.redpath@aecom.com or at (808) 954-4525.

Sincerely,

George Redpath
Senior Project Manager

Enclosures: Enclosure A – Project Location Map
Enclosure B – Photo Log
Enclosure C – Proposed Geotechnical Soil Boring Locations
Enclosure D – Bridge Profile
Enclosure E – Traffic Control Plans
Enclosure F – BMP Drawings

cc: Richelle Takara, FHWA (via email)
Carl V. Dominguez, DPW (via email)
Joaquin Blaz, DPW (via email)
Jim Mischler, Parsons Brinckerhoff (via email)
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Engineering*Planning*Construction Management*Value Engineering
270 Guerrero Dr. aka Pick-a-nail Rd. Tamuning, GU 96913 Telephone: (671) 646-0947/8
Fax: (671) 646-0901 P.O Box 784 Hagatna, GU 96932 e-mail: ncma@guam.net ncm@ncmacario.com


May 1, 2014

Project: Route 4 Ajayan Bridge Replacement, GQ-ER-004(114)
Merizo, Guam
Subject: GEPA Consultation Letter
Place: GEPA Office
Time: 3::30 pm

## MINUTES OF THE MEETING

Present: Angel B. Marquez, Acting Chief engineer (GEPA)
Alex M. Dorado, P.E. (NCMA)

| Item | Discussed | Action |
|---|---|---|
| 1. | The advanced hard copy consultation letter was personally received by Mr. Marquez. | |
| 2. | I informed him that an official consultation letter will be mailed to them for their review and comments. | |
| 3. | Mr. Marquez told me that they will review the letter and any comments will be sent to us. I also told him that we are willing to seat down with them to discuss their comments if needed. | |

The meeting was adjourned at 3:45pm.

Prepared by:

Alex M. Dorado, P.E.

## G.6 Government of Guam, State Historic Preservation Office

**Department of Parks and Recreation**
**Government of Guam**
**490 Chalan Palasyo**
**Agana Heights, Guam 96910**
**Director's Office: (671) 475-6296/7**
**Facsimile: (671) 477-0997**
**Parks Division: (671) 475-6288/9**
**Guam Historic Resources Division: (671) 475-6294/5**
**Facsimile: (671) 477-2822**

**Eddie B. Calvo**
*Governor*

**Ray Tenorio**
*Lt. Governor*

**Raymond F.Y. Blas**
*Director*

In reply refer to:
RC 2012-10140

December 3, 2013

Richelle M. Takara, P.E.
Transportation Engineer
U.S. DOT - Federal Highway Administration
300 Ala Moana Blvd., Rm 3-306
Box 50206
Honolulu, HI 96850

Subject: Review of: *Archaeological Monitoring and Data Recovery Plan for the Ajayan Bridge Replacement Project, Merizo, Guam*

Dear Ms. Takara:

We reviewed the subject plan and have the following comments:

1. Page 3, Photos 1 and 2: These photos are basically the same westward views. Please replace Photo 2 with a view facing eastward. Photo 2 can be used elsewhere to express the non-need for any testing in this area.

2. Page 4, Figure 2: The figure is too small and the north arrow should point toward the spine of the document when presenting landscape figures.

3. Page 6, Number 7: A Management Summary (MS) is transformed into an "Abbreviated Report" (AB). The way it reads here it is just the re-designation of the name.

4. Pages 16, 17, and 19, Figures 4, 5 and 6: Please place tics on maps in the future.

5. Page 22, Trade and Exchange, First Paragraph: Will an Energy Dispersive X-Ray Fluorescence analysis be conducted to identify the lithics and possible source of material, or will some other type of analysis be used?

6. Page 24, Data Collection and Recording, First Paragraph: Remove the word "Traditional."

7. Page 25, First Paragraph: Significant features need to be bisected with half removed for floatation for light and heavy fractions.

Should you have any questions do not hesitate to contact us at (671) 475-6339.

Sincerely,

Raymond F.Y. Blas
Director

Lynda Bordallo Aguon
State Historic Preservation Officer

cc: Debra K. Green, IARII and N.C. Macario & Associates, Inc.

U.S. Department of Transportation
**Federal Highway Administration**

**Hawaii Federal-Aid Division**

300 Ala Moana Blvd, Rm 3-306
Box 50206
Honolulu, Hawaii 96850
Phone: (808) 541-2700
Fax: (808) 541-2704

January 27, 2014

In Reply Refer To:
HDA-HI

**Ms. Lynda Aguon**
**State Historic Preservation Officer**
Guam Historic Resources Division
Department of Parks and Recreation
490 Chalan Palayso
Agana Heights, GU 96910

**Subject: Final Archaeological Monitoring and Data Recovery Plan - Ajayan Bridge Replacement**
**Project Number GQ-ER-004(114)**
**RC2012-10140**

Dear Ms. Aguon:

Thank you for your letter dated December 3, 2013 which provided comments to the November 2013 Archeological Monitoring and Data Recovery Plan (AMDRP) for the subject project. Enclosed please find a revised AMDRP which addresses all your comments.

We hope you find this document to your satisfaction and thank you for your assistance. We look forward to your approval of the AMDRP for the subject project, as submitted. If you have any comments or questions, please contact me at (866) 233-8177 extension 2311 or email me at Richelle.takara@dot.gov.

Sincerely yours,

Richelle M. Takara, P.E.
Transportation Engineer

Enclosure: Revised AMDDRP dated December 2013

cc: Carl V. Dominguez, DPW (via email)
Joaquin Blaz, DPW (via email)
Ray Blas, DPW (via email)
Snaebjorn Jonasson, PTG (via email)
Nora K. Camacho, PB (via email)
N,C. Macario (via email)
Debra K. Green, IARII (via email)
John Mark Joseph, DPR (via email)

**Department of Parks and Recreation**
**Government of Guam**
**490 Chalan Palasyo**
**Agana Heights, Guam 96910**
**Director's Office: (671) 475-6296/7**
**Facsimile: (671) 477-0997**
**Parks Division: (671) 475-6288/9**
**Guam Historic Resources Division: (671) 475-6294/5**
**Facsimile: (671) 477-2822**

**Eddie B. Calvo**
*Governor*

**Ray Tenorio**
*Lt. Governor*

**Raymond F.Y. Blas**
*Director*

In reply refer to:
RC2012-10140

January 28, 2014

Richelle M. Takara, P.E.
Transportation Engineer
Hawaii Federal-Aid Division
Federal Highway Administration
U.S. Department of Transportation
300 Ala Moana Blvd, Rm 3-306
Box 50206
Honolulu, Hawaii 96850

Subject: Review of Final Archaeological Monitoring and Data Recovery Plan
Ajayan Bridge Replacement
Project Number GQ-ER-004(114)
RC2012-10140

Dear Ms. Takara:

Thank you for submitting the Final Archaeological Monitoring and Data Recovery Plan dated December 2013, including the Comments Resolution Table, which, in all due respect, expedited our review. You have more than adequately addressed our December 3, 2013 comments, thus, we find the Final AMDRP acceptable.

We look forward to working closely with you on this, and other FHWA Guam projects. Should you require further assistance, please do not hesitate to contact our office.

Sincerely,

Raymond F.Y. Blas
Director

Lynda Bordallo Aguon
State Historic Preservation Officer

**Eddie B. Calvo**
*Governor*

**Ray Tenorio**
*Lt. Governor*

**Department of Parks and Recreation**
**Government of Guam**
**490 Chalan Palasyo, Agana Heights, Guam 96910**
**Director's Office: (671) 475-6296/7; Fax (671) 477-0997**
**Parks Division: (671) 475-6288/9**
**Guam Historic Resources Division: (671) 475-6294/5**
**Facsimile: (671) 477-2822**

**Robert S. Lizama**
*Director*

**William N. Reyes**
*Deputy Director*

In reply refer to:
RC2012-10140

July 18, 2016

Richelle M. Takara, P.E.
Transportation Engineer
Hawaii Federal-Aid Division
U.S. Department of Transportation
Federal highway Administration
300 Ala Moana Blvd, Rm 3-306
Box 50206
Honolulu, Hawaii 96850

Subject: *Ajayan Bridge Replacement Project, FHWA Project Number: GQ-ER-0004(114)*
*SHPO Reference: RC2012-1014*
*Draft Letter Report and Request for Concurrence on Section 106 Determination*

Dear Ms. Takara:

We have reviewed your letter dated March 10, 2016, along with the attached Draft Letter Report, and have provided our comments below.

The original Archaeological Monitoring and Data Recovery Plan (AMDRP) (Green 2013), was revised with a modified testing plan and further amended in a GHRD Request for Assistance *(J.M. Joseph, November 23, 2015)* from IARII (*IARII Draft Letter Report to Nemencio C. Macario, January 18, 2016).*

The final plan resulted in conducting a pedestrian archaeological survey east of the bridge (Area A) and excavation of six (6) backhoe trenches (BT) in areas that have the potential to impact cultural deposits. Two (2) backhoe trenches were excavated in the embankment on the south edge of Route 4 and four (4) were excavated in Area A (as shown in Figure 2, on Page 8.) These modifications and changes resulted in an amended Scope of Work as Phase 1 and Phase 2; please refer to your letter to SHPO dated February 12, 2015.

Comments on the Draft Letter Report include:

- Figure 2, Page 8 - Ajayan Bridge Restoration engineering map showing areas of concerns and locations of backhoe trenches, provided by Macario and Associates. Our GIS map shows Ahayan Way located on the west-side of the river, instead of east-side of the river, inside Area A. Re-confirm location of Ahayan Way, and make the correction if necessary.

- Figure 3, on Page 9 - 11" X 14" pull-out page that shows the photographs of the stratigraphic profiles of the backhoe trenches that were excavated. The photos are small and Trench No. 4 photo was not included, neither were photo-boards visible in any of the photos. Trench No. 4 must be included, and the photo-boards must be visible in all of the photos of the backhoe trenches.

Moreover, instead of using the 11" X 14" pull-out page for all the six (6) stratigraphic profiles and photos of the backhoe trenches, please prepare these in the following manner:

> "Photos should be 3.5 to 3.92 in height for landscape photos. Portrait photos should range from 4.5 to 7.7 inches in height. If the photo or figure takes up the entire page then the caption should be at fore edge and not at the spine of the document. Photos, images, and figures must not be blurry, and the photo-board, north arrow and scale needs to be visible in the photograph. If the photos are small then there should be two (2) photos per page, thus, reducing white space. Correlate your figures, photos, etc., with the narrative. Profile and plan view photos of excavation units, features should be taken straight on and not at severe angles."
> (Basic Reporting Requirements, March 18, 2014)

- It appears that none of the backhoe trenches were deeper than 7 feet (2.13 m), although they may be discontinued if solid rock or submerged coarse marine sediment are being encountered. All BTs mentioned resulted in no encounters or exposure of archaeological or cultural materials, deposits, or features, but in Trench 5, when does a road not constitute a feature? Doesn't this road represent a buried A Horizon?

- Although we did not receive your Section 106 request to review this undertaking in the initial stages of consultation, we will concur with your determination of "No Adverse Effect" on historic properties, after we review and accept the Draft Report with the corrections noted above.

We look forward to receiving the Draft Report. If you have any questions or need clarification, please do not hesitate to contact us.

Sincerely,

For Robert S. Lizama
Director

Lynda Bordallo Aguon
State Historic Preservation Officer

Cc: Jeff Wilson, P.E., Senior Project Manager
Parsons Brinckerhoff, Inc.
Glenn Leon Guerrero, DPW
Rachel Adams, PB
Joaquin Blaz, DPW

**Eddie B. Calvo**
*Governor*

**Ray Tenorio**
*Lt. Governor*

**Department of Parks and Recreation**
**Government of Guam**
**490 Chalan Palasyo, Agana Heights, Guam 96910**
**Director's Office: (671) 475-6296/7; Fax (671) 477-0997**
**Parks Division: (671) 475-6288/9**
**Guam Historic Resources Division: (671) 475-6294/5**
**Facsimile: (671) 477-2822**

**Robert S. Lizama**
*Director*

**William N. Reyes**
*Deputy Director*

In reply refer to:
RC2012-10140

September 14, 2016

Richelle M. Takara, P.E.
Transportation Engineer
Hawaii Federal-Aid Division
U. S. Department of Transportation
Federal Highway Administration
300 Ala Moana Blvd., Rm 3-306
Box 50206
Honolulu, Hawaii 96850

Subject: Review of Final Technical Report
Archaeological Survey and Subsurface Testing
Ajayan Bridge Replacement Project, Inarajan, Guam
GQ-ER-0004(114)

Dear Ms. Takara,

We reviewed the subject Final Technical Report and found it acceptable. The report addressed our July 18, 2016 comments. Although the shapefiles were not included, we will accept the two copies.

Thank you for your patience and your understanding.

Sincerely,

Robert S. Lizama
Director

Lynda Bordallo Aguon
State Historic Preservation Officer

# G.7 National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Pacific Islands Regional Office, Protected Resources Divisions – Endangered Species Act Consultation

AECOM
1001 Bishop Street
Suite 1600
Honolulu, HI 96813
www.aecom.com

808 523 8874 tel
808 523 8950 fax

May 31, 2012

Ms. Lisa Van Atta
Assistant Regional Administrator - Protected Resources Division
National Marine Fisheries Service
Pacific Islands Regional Office
1601 Kapiolani Blvd., Suite 1110
Honolulu, HI 96814

Subject: Guam Department of Public Works, Proposed Ajayan Bridge Replacement Project Project No. GQ-ER-0004(114)/GU-NH-0004(114)
Request for Species List

Director Ms. Van Atta:

The U.S. Department of Transportation - Federal Highways Administration (FHWA), in coordination with the Guam Department of Public Works (DPW) proposes to replace the existing Ajayan River Bridge located on Route 4, on the boundary between Merizo and Inarajan. A Categorical Exclusion document for compliance with the National Environmental Policy Act (NEPA) will be prepared for the project.

**Ajayan Bridge Existing Condition**
The Ajayan River Bridge is located on Route 4 on the boundary between Merizo and Inarajan, as shown in Figure 1-1.

The existing single span cast-in-place concrete box girder bridge was constructed in 1968 with a span of approximately 76.2 feet and a skew of 40 degrees. Abutments are founded on concrete piles and the deck has an asphalt concrete wearing surface. The most recent bridge inspection report, dated May 27, 2004, noted that the substructure and channel are rated in serious condition with cracking and differential movement noted for substructure units and significant scour at abutments, as shown in the enclosed Photo Log. The channel alignment and waterway opening are also noted as deficient.

**Proposed Action**
The proposed action would replace the existing two-lane bridge across the Ajayan River just upstream of the river mouth as it enters the ocean. Bridge abutment slopes would be protected from erosion by placement of stone rip rap. There would be minimal roadway approach work. Proposed improvements include two 12-foot lanes with 8-foot paved shoulders. Roadway alignment and grade would match existing at points of tie-in. Roadway work within project limits would include removal of the existing pavement and design of full-depth pavement replacement and replacement of guardrail. The proposed action would include geotechnical sampling, testing, and analysis. As shown in Figure 1-2, soil borings for bridge foundations would be taken at two locations, one at each proposed substructure unit, to a depth of at least 100 feet or at least 10 feet into competent bedrock, whichever is shallower. Additionally, two shallow borings to a depth of 15 feet would be taken within the roadway approach area. All work would be conducted within existing right-of-way.

AECOM
1001 Bishop Street
Suite 1600
Honolulu, HI 96813
www.aecom.com

808 523 8874 tel
808 523 8950 fax

To assist FHWA and DPW with report documentation, compliance with the Endangered Species Act, NEPA, and other relevant laws and regulations, we respectfully request a listing of threatened and endangered species, Federal candidate species, and/or plants and animals of special concern that are known to occur or have the potential to occur within the proposed project area.

We appreciate your efforts in assisting us with the development of this project. If you require additional information, please feel free to contact me at 808.356.5394 (office direct), 808.223.9213 (cell), or via email at Jennifer.Scheffel@aecom.com.

Thank you for your attention to this project notification and any comments you may have.

Sincerely,

Jennifer M. Scheffel
Environmental Planner

Enclosures: Figure 1-1: Site Location Map
Figure 1-2: Geotechnical Soil Boring Locations
Photo Log

cc: Don Hubner, NMFS (via email)
Joanne M. S. Brown, DPW (via email)
Ramon Padua, DPW (via email)
Joaquin Blaz, DPW (via email)
Paul Wolf, Parsons Brinckerhoff (via email)
Nora Camacho, Parsons Brinckerhoff (via email)
James Mischler, Parsons Brinckerhoff (via email)
Jennifer Scheffel, AECOM (via email)
Edgar Hipolito, AECOM (via email)
Nemencio Macario, N.C. Macario & Associates, Inc. (via email)
Richelle Takara, FHWA (via email)

## Scheffel, Jennifer

**From:** Donald Hubner [donald.hubner@noaa.gov]
**Sent:** Monday, June 04, 2012 3:59 PM
**To:** Scheffel, Jennifer
**Cc:** joanne.brown@dpw.guam.gov; joaquin.blaz@dpw.guam.gov; Richelle.TAKARA@dot.gov; Wolf@pbworld.com; 'Camacho, Nora'; Patrick Opay
**Subject:** Ajayan Bridge Replacement Project, Guam, FHWA Project No. GQ-ER-0004(114)/GU-NH-0004(114)
**Attachments:** Marianas Species List Apr 2008.doc; IndoPacific_Corals-for Pub until proposal.xls

Aloha and Hafa Adai Jennifer, and All, (Please disregard the previous e-mail with the wrong subject line) : /

My name is Donald M. Hubner. I am an endangered species biologist at the NMFS Pacific Islands Regional Office, and have been assigned to provide the species list your office requested for the Federal Highway Administration's (FHWA) proposed Ajayan Bridge Replacement Project, Guam, FHWA Project No. GQ-ER-0004(114)/GU-NH-0004(114).

The information I provide here is limited to protected species under NMFS jurisdiction (marine resources), and is based on the best information available to me at this time, here in Hawaii. I recommend that you contact the US Fish and Wildlife Service (USFWS) for protected species under their jurisdiction (terrestrial and aquatic), as well as contacting the Government of Guam's Division of Aquatic and Wildlife Resources (DAWR) for more refined, site-specific species and habitat information, such as any upstream occurrence of sea turtles at the project site.

The information provided in your May 31, 2012, letter indicates that the project would take place adjacent to the marine shoreline, but does not describe in any detail what in-water work would be done to remove and replace the bridge. Green and hawksbill sea turtles (*Chelonia mydas* and *Eretmochelys imbricata*, respectively) are ESA-listed species under NMFS jurisdiction that are expected to occur within the immediate area of the subject bridge. Both species are known to swim upstream into fresh water (Satellite tags have confirmed green sea turtles at least 1 mile upstream in some cases. I recommend that you contact DAWR staff on Guam for sight-specific information. There are also several species of corals that are candidates for listing under the ESA. The attached file indicates the best information we currently have to identify which of the candidate corals may be found on Guam. However, we have no information to confirm or deny their occurrence at the project site or on adjacent reefs.

Should the project include in-water pile driving, or other activities that could have off-shore effects, several marine mammal species could also be impacted. Please refer to the attached species list for all protected marine species that are known or expected to occur in the Marianas Archipelago. Of those animals, humpback and sperm whales (*Megaptera novaeangliae* and *Physeter macrocephalu*s) are ESA/MMPA protected species that could occur within the action area. Spinner dolphins (*Stenella longirostris*) are also know to occur in nearshore waters around Guam, but are protected under the MMPA only. Should this action be expected to adversely impact marine mammals, our Silver Spring Office needs to be included in the consultation for coverage under the MMPA.

Please contact me if you have any questions or comments.
Thank you, Don

--
Donald M. Hubner
Endangered Species Biologist
NOAA/NMFS Pacific Islands Regional Office

AECOM
1001 Bishop Street, Suite 1600
Honolulu, Hawaii 96813-3698
www.aecom.com

808 523 8874 tel
808 523 8950 fax

November 12, 2012

Mr. Donald Hubner
Endangered Species Biologist
NOAA/NMFS Pacific Islands Regional Office
1601 Kapiolani Blvd., Ste 1110
Honolulu, HI 96814

**Subject**: Ajayan Bridge Replacement Project Proposed Construction Details
Project No. GQ-ER-0004(114)/GU-NH-0004(114)

Dear Mr. Hubner,

This letter is to follow-up with you on the proposed subject line project. Throughout our consultation process with local and federal agencies, there have been a few instances when there was a misunderstanding over the project location. To the east of our proposed project there is another separate Federal Highway Administration (FHWA) project taking place at the Agfayan Bridge. The intent of this letter is to clarify the project location and give a more thorough description of the demolition and construction work being proposed in the Ajayan Bridge Replacement Project.

**Background**

In June 2012, AECOM sent a letter to FWS, National Marine Fisheries Service (NMFS), and Guam Department of Agriculture DAWR, describing the proposed bridge replacement project and requesting a list of threatened and endangered species that are known to occur or have the potential to occur within the proposed project area (Attachment 1). We received an email response from your office (see Attachment 2) and want to clarify that it was indeed referring to the Ajayan Bridge (see Figure 1, Site Location Map).

**Project Specifics**

The existing bridge will be demolished by cutting it into sections that will be removed by a crane. The existing bridge abutments will be demolished and the existing piles will be cut down to the river bed. The embankment soil between the old abutment and the new abutment will be removed (Figure 2, Bridge Profile). The bridge will be partially demolished to allow two-way, one land traffic while the first half of the new bridge is being constructed. After phase 1 is complete, it will be shifted to the other side to construct the other half of the bridge. Best

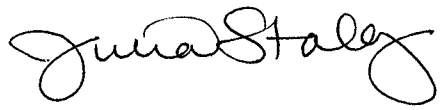
Management Practice (BMP) will include catchment platforms and protective netting, silt screen fences, and a turbidity curtain.

All work will be completed within the existing right-of-way (ROW). The proposed new 40-foot wide by 105-foot long bridge will replace the existing box beam type bridge. A new bridge foundation will be constructed inland, or behind the existing abutment to minimize disturbance to the river channel. Twenty-four new piles will be driven to support the new abutment. The soil between to old abutment and new abutment will be excavated and grouted riprap will be placed on a gradual slope from the new abutment to the remaining old pilings. Each side of the bridge will have a concrete barrier poured integrally with the bridge deck. A standard road barrier and railing on either side of the bridge will tie in to the concrete barrier. All other utilities will be considered as part of the load to be carried by the bridge and supported by the bridge hangers. All construction will take place within the existing right-of-way and, with the exception of the temporary turbidity curtain, no construction will take place in the river channel.

**Recommendation**

We appreciate the comments sent via email in June. We will continue to consult with your office regarding the species of concern and to clarify your questions regarding proposed construction methods. If you have additional comments or recommendations based on the above proposed project specifics, please contact Julia Staley at julia.staley@aecom.com or at 808-954-4523.

Sincerely,



Julia Staley
Environmental Planner

Enclosures: Consultation letter AECOM to NMFS
Consultation response NMFS to AECOM
Project Location Map
Bridge Profile Plan

c: Valerie Brown, NMFS (via email)
Nora Camacho, PB (via email)
James Mischler, PB (via email)

## Johnson, Landin

**From:** Donald Hubner <donald.hubner@noaa.gov>
**Sent:** Tuesday, November 20, 2012 1:35 PM
**To:** Staley, Julia
**Cc:** valerie.brown@noaa.gov; CamachoN@pbworld.com; Mischler@pbworld.com; Redpath, George
**Subject:** Re: Ajayan Bridge Replacement; Project No. GQ-ER-0004(114)/GU-NH-0004(114)

Aloha Julia,
It has been such a pleasure working with you! : )

In answer to the question of whether or not the species list I originally sent applies to the Ajayan Bridge Project (Proj. No, GQ-ER-0004(114)/GU-NH0004(114), yes, it does. However, based on the project description provided, there would be no in-water pile driving, so I doubt that there would be any impact on marine mammals. In short, green and hawksbill sea turtles are the only ESA-listed marine species expected to occur in the action area for this project. As discussed, I still recommend that you contact Val Brown
of NMFS HCD, and Brent Tibbets (spl?) of Guam DAWR to determine which (if any) corals may be growing on or near the bridge.
Mahalo, Don

--
Donald M. Hubner
Endangered Species Biologist
NOAA/NMFS Pacific Islands Regional Office
1601 Kapiolani Blvd. Ste 1110
Honolulu, HI 96814
(808) 944-2233

On 11/12/2012 10:14 AM, Staley, Julia wrote:

> Aloha Mr. Hubner,
>
> As per our conversation last week, I am sending you the description for the subject line project. I have copied Ms. Brown on this for further coordination on obtaining a complete species list. You requested that we send this letter electronically; if in the future you would like a hard copy, I am happy to oblige. We appreciate your help.
>
> Thank you for your assistance,
> Julia
>
> Julia Staley
> Environmental Planner
> West Region, Pacific District
> Direct 808.954.4523 Fax 808.523.8950
> julia.staley@aecom.com
>
> **AECOM**
> 1001 Bishop Street, Suite 1600, Honolulu, HI 96813
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U.S. Department of Transportation
**Federal Highway Administration**

**Hawaii Federal-Aid Division**

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July 23, 2014

In Reply Refer To:
HDA-HI

**Ms. Lisa Van Atta**
**Assistant Regional Administrator – Protected Resources**
**National Marine Fisheries Service**
**Pacific Islands Regional Office**
**NOAA Inouye Regional Center**
**1845 Wasp Blvd., Building 176**
**Honolulu, HI 96818**

**Subject: Route 4 Ajayan Bridge Replacement,**
**Project No. GQ-ER-0004(114)**
**Section 7 Endangered Species Act**

Dear Ms. Van Atta,

The U.S. Department of Transportation Federal Highways Administration (FHWA), in close coordination with the Guam Department of Public Works (DPW) requests initiation of informal consultation under Section 7(a)(2) of the Endangered Species Act (ESA) and concurrence with a determination of effect for the proposed replacement of the existing Ajayan River Bridge located on Route 4, on the boundary between Merizo and Inarajan(Project No. GQ-ER-0004(114)).

**Ajayan Bridge Existing Condition**

The Ajayan Bridge is located on Route 4 on the boundary between Merizo and Inarajan. The bridge provides two lanes that cross the Ajayan River just upstream of the river mouth as it enters the ocean (Enclosure 1 – Project Location Map).

The existing single-span cast-in-place concrete box girder bridge was constructed in 1968, with a span length of approximately 76.2 feet and a skew of 40 degrees. Abutments are founded on concrete piles; the deck has an asphalt concrete wearing surface. The most recent bridge inspection report, dated May 27, 2004, noted that the substructure and channel are rated in serious condition. The damage noted includes cracking and differential movement of substructure units and significant scour at abutments (Enclosure 2 – Photo Log).

**Project Description**

The existing bridge will be demolished and replaced with a new 40-foot-wide by 105-foot-long bridge. The proposed improvements include two 12-foot-wide lanes and two 8-foot-wide paved shoulders. Roadway alignment and grade will match the existing at the point of tie-in.

To accommodate traffic while the new bridge is being constructed, the bridge will be demolished in two phases, demolishing one side (longitudinally) of the bridge at a time. This will allow two-way traffic (one lane, controlled by traffic lights) to use the bridge during demolition and construction.

The project will entail the demolition and removal of the existing bridge structure and existing pile caps. The existing piles below the waterline will be cut and capped at the mudline, but left in-place. This will provide for minimal disturbance of the aquatic ecosystem. Roadway work within the project limits will include removal of the existing pavement, full-depth pavement replacement, and replacement of the guardrails. The proposed action will also include geotechnical sampling, testing, and analysis. As shown in Enclosure 3 – Proposed Geotechnical Soil Boring Locations, soil borings for bridge foundations will be taken at two locations, one at each proposed substructure unit, to a depth of at least 100 feet or at least 10 feet into competent bedrock, whichever is shallower. Additionally, two shallow borings to a depth of 15 feet will be taken within the roadway approach area.

**Demolition and Construction Methods**

Demolition

Bridge demolition will include removal of the existing bridge deck, box beam, abutments, wing walls, guardrails, and parapet. The existing bridge is approximately 29.6 feet wide and will be demolished in two phases to allow for one lane to remain open for traffic. Phase 1 will include saw-cutting the westbound portion of the existing bridge and removing it by crane. Phase 2 will include the same actions to the eastbound portion of the existing bridge. Before demolition and removal, a temporary concrete barrier will be installed on the existing bridge, and existing utilities will be temporarily relocated to the opposite portion of the bridge during each phase.

Demolition of the existing abutment walls will be accomplished by use of jackhammers and/or hoe rams, and removed via mechanical equipment such as a backhoe. The existing bridge abutments will be demolished and the existing piles will be cut down to the river bed. The soil between the old abutment and new abutment will be excavated, and 48-inch-thick grouted riprap will be placed on a gradual slope from the new abutment to the remaining old pilings, as shown in Enclosure 4 – Bridge Profile. A combined total of approximately 540 cubic yards of soil and concrete abutment wall material will be excavated from below the mean high water (MHW) line of the Ajayan River. The combined total linear disturbance to the stream channel from the excavation of the soil and concrete abutment wall material will be approximately 407 linear feet.

Construction

Construction of the new bridge will also be performed in two phases so that two-way signal-controlled traffic can be maintained in one lane during construction. Phase 1 will include demolition of the existing westbound portion of the bridge and construction of the new westbound portion of the bridge. During Phase 1, utilities and two-way signal-controlled traffic will be temporarily relocated to the eastbound portion of the existing bridge. Phase 2 will include demolition of the existing eastbound portion of the bridge and construction of the new eastbound portion of the bridge. During Phase 2, utilities will be permanently installed in the westbound portion of the new bridge, and two-way signal-controlled traffic will be temporarily relocated to the westbound portion of the new bridge. Work areas for Phase 1 and Phase 2 are shown in Enclosure 5 – Traffic Control Plans.

A new bridge foundation will be constructed inland, or behind, the existing abutment to minimize disturbance to the river channel. The proposed abutments will be set back from the existing abutments. The soil and grouted riprap between the remaining existing piles and the new abutment will be sloped back at a 3H:1V ratio. The two new abutments will be constructed at the top of the slope and supported by twelve piles (per abutment), for a combined total of twenty-four new octagonal 16.5-inch-diameter concrete piles (100 tons per pile). The new abutments and abutment piles will be constructed above the MHW line.

Approximately 947 cubic yards of grouted stone riprap will be placed along the abutment walls, below the MHW line, to protect the abutment from erosion caused by waves. The riprap (fill material) will be placed along approximately 401 linear feet of stream channel. The riprap will be placed within the excavation footprint and will not impact additional areas of the stream channel.

Best Management Practices

Best management practices (BMPs) will include catchment platforms and protective netting, silt screen fences, and turbidity curtains. Catchment platforms and protective netting will be installed under the bridge to keep debris from falling into the water. Silt screen fences will be placed at the slope toe around the river edges to prevent erosion and rubbish from going into the water. Turbidity curtains will be installed at both river banks surrounding the work areas to prevent the spread of silt and sediment into the river and bay (see Enclosure 6 – BMP Drawings).

**Natural Environments**

The proposed project is located within the southern end of Guam, which is characterized by hilly volcanic slopes descending from approximately 800 feet in elevation to sea level over distances of less than 2.5 miles. The project site is situated between the Inarajan and Manell watersheds. The Ajayan Bridge is situated on the southern end of the Ajayan River, adjacent to the Ajayan Bay discharge point. Flora and fauna surveys of the proposed project area were conducted by SWCA Environmental Consultants (SWCA) on November 6 and 7, 2013. During these surveys, emphasis was placed on identifying special-status species. The following paragraphs describe the existing terrestrial and aquatic environments that occur within the proposed project area as reported by SWCA and Guam Department of Agriculture, Division of Aquatic and Wildlife Resources (DAWR).

Terrestrial Ecology

Forest surrounding the project area consists mostly of secondary thicket/scrub forest with some ravine forest. Areas of forested palustrine wetlands are located along the east and west banks of the Ajayan River. Several typhoons that occurred between the 1970s and 1990s changed the vegetation in the area dramatically. Site visits conducted by Guam DAWR staff in February and March 2013 found that pago (*Hibiscus tiliaceus*) and tangantangan (*Leucaena leucocephala*) were the two common species in the project area.

During flora surveys performed by SWCA on November 6 and 7, 2013, a total of 19 plants were identified to either genera or species. The seven native plants documented consisted of five trees (pago, *Pandanus tectorius*, *Bougainvillea glabra*, *Callicarpa candicans*, and *Morinda citrifolia*), one fern (*Polypodium scolopendria*), and one grass (*Saccharum spontaneum*). The non-native plants documented were pugua (*Areca catechu*), coconut trees (*Cocos nucifera*), beggar's tick (*Bidens alba*), Siam weed (*Chromolaena odorata*), mile-a-minute vine (*Mikania scanden*), daok (*Calophyllum inophyllum*), papaya (*Carica papaya*), tangantangan, kamachile (*Pithecellobium dulce*), and *Musa* sp.

Shoreline Ecology

The project area is located at the mouth of the Ajayan River as it discharges into Achang Reef Flat. The shoreline vegetation is composed primarily of coconut trees, pago, and tangantangan.

Although not located within the boundaries of the project area, a small Nypa palm (*Nypa fruticans*) (also referred to as "Nipa") community was identified approximately 10 meters upstream of the Ajayan River. This species is a wetland obligate and grows in brackish marshes.

Aquatic Ecology

The Ajayan River flows south and discharges at the Ajayan Bay. The Ajayan Bay includes the eastern portion of the Achang Reef Flat Marine Preserve (Enclosure 7 – Achang Reef Flat Marine Preserve). The Ajayan River channel cuts completely through the reef flat at Ajayan Bay. The reef flat consists of inner and outer reef flats that are exposed at low tide. Mangroves and sea grass beds are present in the vicinity of the project site.

According to the University of Guam Marine Laboratory's Guam Coastal Atlas (www.guammarinelab.com/coastal.atlas/htm/Maps.htm), the benthic habitat of the river channel is composed of "sand, uncolonized 90% to 100%", extending from inland waters to 500 meters offshore. The benthic habitat to the east of the channel is composed of "spur and groove, coral 10% to <50%" near the shore, and "pavement, turf 50% to <90%" after approximately 100 meters offshore. The benthic habitat to the west of the channel is composed of "spur and groove, coral 50% to <90%" near the shore, and "pavement, coral 10% to <50%" after approximately 50 meters offshore.

The Achang Reef Flat supports primarily hard corals. Only two soft coral species have been identified by the University of Guam Marine Lab during monitoring of the site.

Achang Reef Flat is classified as M-1, Excellent. Waters in this category are suitable for whole-body contact and recreation. These waters are also needed for research and to ensure the preservation and protection of marine life, including coral, reef-dwelling organisms, fish, and related resources, and aesthetic enjoyment. The surface waters of the Ajayan River are classified as S-3, Low. Waters in this category are used primarily for commercial, agriculture, or industrial activity. Aesthetic enjoyment and recreational body contact are limited. Maintenance of aquatic life is also limited.

Four sea turtle species occur in the coastal waters surrounding Guam. The green sea turtle (*Chelonia mydas*) and loggerhead sea turtle (*Caretta caretta*) are federally and locally listed as threatened. The Hawksbill sea turtle (*Eretmochelys imbricate*) and leatherback sea turtle (*Dermochelys coriacea*) are federally and locally listed as endangered.

**Agency Coordination**

In May 2012, AECOM sent a letter to NMFS describing the proposed bridge replacement project and requesting a list of threatened and endangered species that are known to occur or have the potential to occur within the proposed project area. In June AECOM received an email response from your office; (1) identifying the green sea turtle and the hawksbill sea turtle as federally listed species under NMFS jurisdiction expected to occur within the immediate area of the project, (2) recommending U.S. Fish and Wildlife Service (USFWS) and Guam's Division of Aquatic and Wildlife Resource (DAWR) be contacted regarding species under their jurisdiction, (3) stating that the NMFS Silver Springs Office would need to be included in the consultation for coverage under the Marine Mammal Protection Act (MMPA) should the project include in-water pile driving, or other activities that could have off-shore effects, and (4) provided a list of coral species which are candidates for listing under the ESA (Enclosure 8 – June 2012 Response from NMFS). In November 2012, AECOM sent a second letter to NMFS clarifying the project location and provide a more detailed description of proposed demolition and construction activities for the Ajayan Bridge Replacement Project.

Letters describing proposed project activities and requesting lists of special-status species were also sent to USFWS and DAWR. FHWA is also sending a request to USFWS for concurrence on ESA and special-status species effect determinations. An Essential Fish Habitat consultation request has been submitted to NMFS. A description of proposed project activities has been provided to the U.S. Army Corps of Engineers (ACOE). A formal request for Clean Water Act Section 404 Permit and Rivers and Harbors Act

Section 10 Permit will be submitted to the ACOE. The NMFS Silver Spring Office has not be consulted because the project does not include in-water pile driving, or other activities that could have off-shore effects to marine mammals.

As requested by the various agencies, flora and fauna surveys were completed for this project. SWCA performed the flora and fauna survey and their report is included as Enclosure 9 – Flora and Fauna Surveys for the Ajayan Bridge Replacement Project.

**Federally Threatened and Endangered Species**

Based on background research and the information provided by NMFS, USFWS, and the DAWR, the only federally threatened and endangered species, under NMFS jurisdiction, that may occur within the proposed project area is the federally threatened green sea turtle and the federally endangered hawksbill sea turtle.

Green Sea Turtle – Federally Threatened

The federally threatened green sea turtle is the largest of the cheloniidae, with adults that can exceed 3.2 feet in carapace length and 268 pounds in body mass. Characteristics that distinguish the green seas turtle from other species of sea turtle include a smooth carapace with four pairs of lateral scutes, a single pair of prefrontal scales, and a lower jaw-edge that is coarsely serrated, corresponding to strong grooved and ridges on the inner surface of the upper jaw.

The green sea turtle is a circumglobal species found in tropical seas and, to a lesser extent, in subtropical waters with temperatures above 20°C. In the Pacific United States (U.S.) and its territories, the green sea turtle is found along the coasts of Hawaii, American Samoa, Guam, the Commonwealth of the Northern Mariana Islands, and unincorporated U.S. island possessions.

The green sea turtle occupies three habitat types that include open beaches, open sea, and feeding grounds in shallow, protected waters. The open beaches are used for nesting purposes where the adult female green seas turtles will emerge at night to excavate nests and deposit a clutch that may be in excess of approximately 100 eggs. The green sea turtle use the shallow water habitats to forage, feeding on selected macroalgae and sea greases. The green sea turtle spends the remaining time in the open sea were they may rest and/or are in transient to feeding grounds and/or nesting habitat[1].

Hawksbill Sea Turtle – Federally Endangered

The federally endangered hawksbill sea turtle is recognized by their relatively small (carapace length less than 3.1 feet), narrow head with tapering "beak," thick, overlapping shell scutes, and strongly serrated posterior margin of the carapace. In addition, hawkbills may be distinguished from the green sea turtle by the transverse division of the prefrontal scales into two pairs (these scales are elongate and undivided in the green sea turtle).

Hawksbill sea turtles are cirumtropical in distribution, generally occurring from 30°N to 30°S latitude within the Atlantic, Pacific, and Indian Oceans and associated bodies of water. Along the far western and southwestern Pacific, hawksbills nest on the islands and mainland of Southeast Asia, from China and Japan, throughout the Philippines, Malaysia, and Indonesia, to Papua New Guinea, the Solomon Islands, and Australia.

The hawksbill sea turtle typically selects remote pocket beaches with little exposed sand to nest and deposit their eggs. The nest site is often within the cover of woody vegetation, although some will

[1] National Marine Fisheries Service and U.S. Fish and Wildlife Service. 1998. Recovery Plan for U.S. Pacific Populations of the Green Turtle (*Chelonia mydas*). National Marine Fisheries Service. Silver Spring, MD.

occasionally nest in grass or open sand if preferred cover is not accessible. Hawksbills are typically found feeding on jellyfish, sea urchins, and sponges within the vicinity of rock or reef habitat in shallow tropical waters with little turbidity[2].

Corals

In February 2010, NMFS issued a Notice of 90-Day Finding on a Petition to List 83 Species of Coral as Threatened or Endangered under the ESA and determined that the petitioned action may be warranted for 82 of the 83 petitioned coral species. The petition asserts that these reef-building corals face habitat threats " from several processes linked to anthropogenic greenhouse gas emissions, including increasing seawater temperatures, increasing ocean acidification, increasing storm intensities, changes in precipitation, and sea-level rise. The petition also asserts that these global habitat threats are exacerbated by local habitat threats posed by ship traffic, dredging, coastal development, pollution, and agricultural and land use practices that increase sedimentation and nutrient loading"[3].

Of these 82 species, a total of 75 candidate coral species are Indo-Pacific corals within U.S. jurisdiction, 35 of which are found in Guam's waters (Table 1). Further information regarding these candidate coral species is described in a status review[4] and a draft management report[5]. In the status review, the NMFS Coral Biological Review Team identified and ranked 19 threats to coral species; the highest threats include global ocean warming, local diseases, and global ocean acidification, while local sedimentation was ranked as low to medium threat.

Information regarding the specific species of coral present in the Achang Reef Flat Marine Preserve is not readily available. Until determined otherwise it is conservatively assumed that candidate coral species are present.

**Table 1. Thirty-Five Candidate Coral Species for ESA Listing Found in the Waters of Guam**

| No. | Candidate Coral Species | No. | Candidate Coral Species (continued) | No. | Candidate Coral Species (continued) |
|---|---|---|---|---|---|
| 1 | *Millepora tuberosa* | 13 | *Acropora polystoma* | 25 | *Pavona bipartita* |
| 2 | *Heliopora coerulea* | 14 | *Acropora striata* | 26 | *Pavona cactus* |
| 3 | *Pocillopora danae* | 15 | *Acropora vaughani* | 27 | *Pavona decussata* |
| 4 | *Pocillopora elegans* | 16 | *Acropora verweyi* | 28 | *Pavona diffluens* |
| 5 | *Seriatopora aculeata* | 17 | *Montipora caliculata* | 29 | *Pavona venosa* |
| 6 | *Acropora aculeus* | 18 | *Montipora lobulata* | 30 | *Barabattoia laddi* |
| 7 | *Acropora acuminata* | 19 | *Alveopora allingi* | 31 | *Cyphastrea agassizi* |
| 8 | *Acropora aspera* | 20 | *Alveopora fenestrata* | 32 | *Euphyllia cristata* |
| 9 | *Acropora globiceps* | 21 | *Alveopora verrilliana* | 33 | *Euphyllia paraancora* |
| 10 | *Acropora listeri* | 22 | *Porites horizontalata* | 34 | *Turbinaria reniformis* |
| 11 | *Acropora microclados* | 23 | *Psammocora stellata* | 35 | *Turbinaria stellulata* |
| 12 | *Acropora palmerae* | 24 | *Leptoseris incrustans* | | |

Potential Suitable Foraging and Nesting Habitat for Green and Hawksbill Sea Turtles

[2] National Marine Fisheries Service and U.S. Fish and Wildlife Service. 1998. Recovery Plan for U.S. Pacific Population of the Hawksbill Turtle (*Eretmochelys imbricate*). National Marine Fisheries Service. Silver Spring, MD.

[3] National Marine Fisheries Service. 2010. Endangered and Threatened Wildlife; Notice of 90-Day Finding on a Petition to List 83 Species of Coral as Threatened or Endangered Under the Endangered Species Act. 6616 Federal Register Vol. 75, No. 27.

[4] Brainard, R.E., C. Birkeland, C.M. Eakin, P. McElhany, M.W. Miller, M. Patterson, and G.A. Piniak. 2011. Status review report of 82 candidate coral species petitioned under the U.S. Endangered Species Act. U.S. Dep. Commer., NOAA Tech. Memo., NOAA-TM-NMFS-PIFSC-27, 530 p. + 1 Appendix.

[5] National Marine Fishereis Service. 2012. Management Report for 82 Corals Status Review under the Endangered Species Act. U.S. Dep. Commer., NOAA Tech Memo.

Suitable foraging habitat for green sea turtle and the hawksbill sea turtle is present within the vicinity of the proposed project. The Achang Reef Flat Marine Preserve provides foraging habitat for sea turtles, with food sources such as macroalgae, seagrass beds, and reef-dwelling organisms. Sea turtles have been observed foraging in Ajayan Bay.

Turtle nesting areas are not present at the project site. The *Recovery Plan for U.S. Pacific Populations of Green Turtle* (dated Jan. 12, 1998) reports that there is some low-level nesting of green sea turtle on Guam. The *Recovery Plan for U.S. Pacific Populations of the Hawksbill Turtle* (dated Jan. 12, 1998) reports that hawksbill nesting is rare on Guam. Known nesting beaches on Guam include Ritidian National Wildlife Refuge, Haputo, Urunao, Tumon Bay, Cabras Island, Spanish Steps, Cocos Island, Acho Bay, Nomña Bay, Jinapsan, Taragüe Beach, and the waterfront annex of Naval Base Guam[6&7]. The closest known turtle nesting beach to the project site is Acho Bay located approximately one mile (1.6 kilometers) northeast of the project site.

**Green Sea Turtle and Hawksbill Sea Turtle Determination of Effects**

Foraging habitat for the green sea turtle and hawksbill sea turtle occurs within the vicinity of the proposed project. While known turtle nesting areas are not present at the project site and turtle nesting is not anticipated, there is potentially suitable nesting habitat in the vicinity of the project area. Therefore, the green sea turtle and hawksbill sea turtle could be impacted by various components of the proposed project. The following paragraphs describe the potential effects the proposed project may have on green sea turtle and the hawksbill sea turtle.

Direct Physical Impact

The proposed project includes the use of heavy equipment such as cranes, saws, backhoes and jackhammers to demolish the existing bridge and construct the replacement bridge. These activities have the potential to directly strike green and hawksbill sea turtles should the animals be present during the placement of riprap or if debris were to accidentally fall into the water. Potential injuries and their severity would depend on the animal's proximity to the falling material or debris, but may include cuts bruises, broken bones, cracked or crushed carapaces, and amputations, any of which could result in the animal's death.

Marine animals will likely avoid the project areas on their own due to the on-going activities. In addition, BMPs have been developed to avoid and/or minimize the potential impacts to sea turtles. Some of the BMPs that would be implemented for the proposed project include performing daily surveys, prior to the commencement of work, to insure sea turtles are not within the work zone; work stoppage upon observing a sea turtle within the proposed project area, allowing it to leave on its own; limiting activity beyond the work zone; insuring all objects that are to be placed in the river, are lowered to the bottom in a controlled manner; and use of catchment platforms and protective netting to keep debris from falling into the water. A detailed list of the BMPs that would be implemented for the proposed project is provided in the Avoidance and Minimization Measures section of this document. **Based on the information, FHWA has determined that direct physical impact to sea turtles is extremely unlikely and would be discountable.**

Loss of Foraging Habitat

The Achang Reef Flat Marine Preserve provides foraging habitat for the green sea turtle and the hawksbill sea turtle. This foraging habitat could be degraded or temporarily impacted by various

[6] Department of Agriculture, Division of Aquatic and Wildlife Resources, Guam (DAWR). 2004. Guam Sea Turtle Recovery Annual Progress Report - March 1, 2004 through August 31, 2004. 9 pp.

[7] Grimm, G. and J. Farley. 2008. Sea Turtle Nesting Activity on Navy Lands, Guam, 2007 – 2008. U.S. Navy, NAVFAC Marianas Environmental, Guam. November 2008. 6 pp.

activities associated with the proposed project. Grading and excavating would be the primary activities that could contribute to the degradation or temporary loss of foraging habitat. The release of sediment into Achang Reef Flat Marine Preserve could occur as the existing abutment walls are demolished and removed, soil behind the existing abutment walls is removed, and new grouted riprap is installed. The sediment released into the Ajayan River could migrate downstream to the Achang Reef Flat Marine Preserve where it would likely disperse and settle on the ocean floor and/or remain suspended in the ocean water. This increase in suspended sediment and sediment deposition within Achang Reef Flat Marine Preserve could damage and /or kill potential food sources for the sea turtles, such as seagrass beds and coral reef communities. Temporary increases in turbidity may also impact habitat quality for foraging sea turtles. However, BMPs have been developed to avoid and minimize impacts to sea turtle foraging habitat as a result of soil erosion, turbidity and/or sediment deposition within the Ajayan River, Ajayan Bay and Achang Reef Flat Marine Preserve. A detailed list of the BMPs that would be implemented for the proposed project is provided in the Avoidance and Minimization Measures section of this document. **Based on this information, FHWA has determined that the loss of potential foraging habitat due to the release of sediment would be discountable and would have insignificant effects on the green and hawksbill sea turtle.**

Exposure to Elevated Noise Levels

Several studies have shown that various anthropogenic activities can generate underwater noise levels that can be detected by a marine species within the range of the particular source. Depending on the species and underwater noise frequency, the underwater noise frequency can induce behavioral responses that are potentially damaging to that species. Construction projects adjacent to, and within the ocean is one of the many activities that can produce underwater sound to a level that it causes an adverse impact upon a marine species. Pile driving, such as that employed for this project, is often the construction activity that produces underwater noise frequencies that are potentially harmful to marine species.

Sea turtle hearing research is limited, but available information about sea turtle sensory biology suggests that they are low frequency specialists, with green sea turtles thought to be most acoustically sensitive between 200 and 700 hertz (Hz)[8]. Because the hearing range of green sea turtles overlaps with the expected frequency range of the pile driving signals, NMFS considers it likely that green sea turtles can hear and respond to pile driving noise. Currently, no acoustic thresholds have been established for sea turtles. However, existing research into sea turtle sensory biology suggests that sea turtles are less acoustically sensitive than cetaceans, relying more heavily on visual cues, rather than auditory input[9&10]. Therefore, application of the marine mammal thresholds would be conservative for sea turtles.

Underwater sound pressure levels are often measured and described in terms of the logarithmic decibel (dB) referenced to a baseline of 1 micropascal (re 1 μPa). To assess the potential impacts of an underwater sound on marine resources, NMFS often assesses impacts based on to root-mean-square ($dB_{rms}$) of an acoustic pulse. This is the portion of the pulse that contains 90% of the sound pressure.

The current acoustic thresholds used by NMFS for marine mammal Permanent Threshold Shift due to exposure to in-water sounds are ≥ 180 dB and ≥ 190 dB for cetaceans and pinnipeds, respectively. Exposure to impulsive in-water sounds at ≥ 160 dB is the threshold onset of Temporary Threshold Shift

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[8] Ridgway, S. H., E.G. Wever, J.G. McCormick, J. Palin, and J.H. Anderson. 1969. Hearing in the Giant Sea Turtle, Chelonia mydas. PNAS, 64, 884-890.

[9] Hazel, J., I.R. Lawler, H. Marsh, and S. Robson. 2007. Vessel speed increases collision risk for the green turtle *Chelonia mydas*. Endangered Species Research 3: 105-113.

[10] Ridgway, S. H., E.G. Wever, J.G. McCormick, J. Palin, and J.H. Anderson. 1969. Hearing in the Giant Sea Turtle, *Chelonia mydas*. PNAS, 64, 884-890.

and behavioral disturbance for all marine mammals. NMFS considers these to be the thresholds for the onset of adverse effects due to acoustic exposures[11].

An underwater noise analysis was not conducted for the proposed project. Site-specific noise measurements for pile-driving at the Ajayan River are not available. California Department of Transportation's (CALTRANS) *Compendium of Pile Driving Sound Data* (Compendium)[12] was referenced for reporting sound levels that would closely approximate sound levels for similar piles, driven in a similar manner as this action.

The proposed construction of the Ajayan Bridge **would not** require in-water pile driving. A total of twenty-four octagonal 16.5-inch-diameter concrete piles would be installed on the shoreline above the MHW line. Piles would be installed with an impact hammer, which would generate impulsive in-water sounds.

The CALTRANS Compendium reports measured levels for the driving of 24-inch-diameter octagonal piles on land. Impact driving of 24-inch-diameter octagonal piles on land measured 181 $dB_{rms}$ at a distance of 10 meters from the source[12].

In the absence of site specific transmission loss data, the practical spreading loss equation, RL = SL – 15LogR, is often used to estimate the RL for actions in shallow nearshore marine waters (RL = received level; SL = source level; and R = range in meters (m)). This equation and the received levels reported in the Compendium as measured at 10 meters for the 24-inch-diameter octagonal concrete piles on land (Table 2).

**Table 2. Estimated source levels and ranges to effect threshold isopleths for similar pile driving actions**

| Piling | Driver | Water Depth | Source Level | Range to 180 $dB_{rms}$ | Range to 160 $dB_{rms}$ |
|---|---|---|---|---|---|
| 24" Concrete | Impact | Land | 196 | 12 meters | 251 meters |

Since the proposed 16.5-inch-diameter concrete piles for the subject project is smaller in diameter than the 24" octagonal piles in the CALTRANS reports cited above, we believe this project will generate lower sound levels in-water and have smaller effect threshold isopleths than the similar pile driving actions presented in Table 2. Considering the relatively low number of sea turtles expected to occur within the project area, relatively minimal proposed pile driving, expected short-range of low sound levels that can cause behavioral disturbance, and a 50-yard (46-meter) shut-down safety range, it is unlikely any sea turtles would be exposed to adverse sound levels produced by pile driving. **Based on this information, FHWA has determined that elevated noise levels due to the pile driving activities would be discountable and would have insignificant effects on the green and hawksbill sea turtles.**

Construction Lighting Impacts

Sea turtle hatchlings emerge from their nest at night and haul themselves towards the ocean where they will spend their entire life. Upon emerging from the nest, hatchlings typically orient themselves toward the brightest direction, which on natural, undeveloped beaches is commonly toward the open horizon of the ocean. However, on developed beaches, the brightest direction is often away from the ocean and toward the lighted structures located along the nesting beach habitat. Therefore, sea turtle hatchlings are often disoriented and unable to find the ocean, which often leads to high mortality

[11] National Marine Fisheries Service, Pacific Islands Region, Protected Resources Division. 2014. ESA – Section 7 Consultation, Biological Opinion, United States Department of the Navy, X-Ray Wharf Improvements, Naval Base Guam – NMFS File No. (PCTS): PRI-2013-9309, PIRO Reference No.: I-PI-13-1105-LVA

[12] California Department of Transportation (CALTRANS), 2007. Compendium of Pile Driving Sound Data. Prepared by Illinworth & Rodkin, 505 Petaluma Blvd. South, Petaluma, CA 94952. September 27, 2007.

rates[13]. In addition, artificial lighting may deter the adult female sea turtle from emerging from the ocean to excavate a nest and lay her clutch of eggs.

Although unlikely, construction of the proposed project may require work after daylight hours; thereby, facilitating the need to use artificial lighting to illuminate the proposed project area. The use of artificial lighting after daylight hours could contribute to disorienting sea turtle hatchlings emerging from their nest and/or discourage an adult female sea turtle from emerging from the ocean to excavate a nest and deposit her clutch of eggs. However, if work is required after daylight hours, the potential impact to sea turtles due to artificial lighting would be minimized by the use of sea turtle friendly lighting; thereby, reducing emitted light from the proposed project area. **Based on this information, FHWA has determined that the exposure to construction lighting would be discountable and would have insignificant effects on the green and hawksbill sea turtles.** The FHWA has also reported this information to the USFWS.

Increased Exposure to Human Interaction

During project construction, there would be an increased presence of human activity that may result in higher incidents of sea turtle and human interaction. The impacts to sea turtles from human interaction would primarily be associated with behavioral changes in the sea turtles that may include avoiding potentially suitable foraging habitat within the Achang Reef Flat Marine Preserve, abrupt body movements while swimming that could cause injury to the sea turtle and may even result in prolonged inactivity at the bottom of the ocean floor[4]. It is unlikely that the increased human presence at the proposed project site would impact sea turtle nesting behavior given that the closest known nesting site is located approximately one mile (1.6 kilometers) to the northeast of the proposed project. However, BMPs have been developed to avoid and/or minimize the potential impacts to sea turtles from human interaction. Some of the BMPs that would be implemented for the proposed project include performing daily surveys, prior to the commencement of work, to insure sea turtles are not within the work zone; work stoppage upon observing a sea turtle within the proposed project area, allowing it to leave on its own; and limiting activity beyond the work zone. A detailed list of the BMPs that would be implemented for the proposed project is provided in the Avoidance and Minimization Measures section of this document. **Based on this information, FHWA has determined that the exposure to increased human activity would be discountable and would have insignificant effects on the green and hawksbill sea turtles.**

Exposure to Elevated Turbidity

Given that sea turtles breathe air instead of water, increased turbidity should not adversely affect their respiration or other biological functions. Although these animals may be found in turbid waters, it is likely that they may avoid dense turbidity plumes in favor of clearer water. However, BMPs have been developed to avoid and minimize elevated turbidity including use of turbidity curtains and erosion and sediment controls. **Based on this information, FHWA has determined that exposure to any plumes of elevated turbidity related to actions of the project will be non-injurious and will result in insignificant effects to green and hawksbill sea turtles.**

Exposure to Waste and Discharges

Construction wastes may include plastic trash and bags that may be ingested and cause digestive blockage or suffocation. Large plastic trash and discarded sections of ropes and lines may entangle marine life. Equipment spills and discharges could include hydrocarbon-based chemicals such as fuel oils, gasoline, lubricants, hydraulic fluids and other toxicants, which could expose protected species to

[13] National Marine Fisheries Service and U.S. Fish and Wildlife Service. 1998. Recovery Plan for U.S. Pacific Population of the Green Turtle (*Chelonia mydas*). National Marine Fisheries Service. Silver Spring, MD.

toxic chemicals. Depending on the chemicals and their concentration, exposure could result in a range of effects, from avoidance of an area to mortality. Local and federal regulations prohibit the intentional discharge of toxic wastes and plastics into the marine environment. In addition, BMPs have been developed to prevent the introduction of wastes and toxicants in the marine environment. Some of the BMPs that would be implemented for the proposed project include use of catchment platforms and protective netting to keep debris from falling into the water; off-site fueling to the extent feasible; storing and staging of construction materials away from the shoreline and river bank; inspection of equipment; readily available spill kits and absorbent pads; and immediate removal of construction debris from the site. A detailed list of the BMPs that would be implemented for the proposed project is provided in the Avoidance and Minimization Measures section of this document. Based on the information, FHWA has determined that discharges of wastes and toxicants are unlikely. Should a discharge occur, appropriate measures would be in place to contain and clean-up the spill. **Based on this information, FHWA has determined that the exposure to wastes and discharges would be discountable and would have insignificant effects on the green and hawksbill sea turtles.**

**Candidate Corals Determination of Effect**

The release of sediment into Achang Reef Flat Marine Preserve could occur as the existing abutment walls are demolished and removed, soil behind the existing abutment walls is removed, and new grouted riprap is installed. The sediment released into the Ajayan River could migrate downstream to the Achang Reef Flat Marine Preserve where it would likely disperse and settle on the ocean floor and/or remain suspended in the ocean water. This increase in suspended sediment and sediment deposition within Achang Reef Flat Marine Preserve could damage and /or kill ESA candidate corals. However, BMPs have been developed to avoid and minimize impacts to corals as a result of soil erosion, turbidity and/or sediment deposition within the Achang Reef Flat Marine Preserve. Some of the BMPs that would be implemented for the proposed project include cessation of in water work during the 21 day hard coral spawning period, erosion and sediment controls, and turbidity curtains. A detailed list of the BMPs that would be implemented for the proposed project is provided in the Avoidance and Minimization Measures section of this document**. Based on this information, FHWA has determined that potential impacts to candidate coral species would be avoided.**

**Avoidance and Minimization Measures**

To avoid and minimize the potential impacts the proposed project may have upon the federally threatened green sea turtle, federally endangered hawksbill sea turtle and other biological and environmental resource, the FHWA and the DPW have developed numerous BMPs that would be implemented during the life of the proposed project. The BMPs to be implemented and maintained for the proposed project would include, but not limited to, the following:

- The contractor will designate a competent observer to survey the areas adjacent to the proposed action for Green Sea Turtles and Hawksbill Sea Turtles prior to the start of work each day and prior to resumption of work following any break of more than 30 minutes when work is above or in the water when there is a potential to directly impact Green Sea Turtles and Hawksbill Sea Turtles.
- If a Green Sea Turtle or a Hawksbill Sea Turtle is discovered within 50 yards of the proposed work activities with the potential to impact or disturb species shall be postponed or halted. Work shall only begin/resume after the animals have voluntarily departed the area.
- Special attention shall be given to verify that no Green Sea Turtles or Hawksbill Sea Turtles are in areas where equipment or materials are expected to contact the substrate before that equipment may enter the water.

- All objects that are to be placed in the river, such as turbidity curtains, riprap, and excavator bucket, shall be lowered to the bottom in a controlled manner. This can include the use of cranes, winches, or other equipment that affect positive control over the rate of decent to minimize turbidity potential.
- No marine vessels, boats, mooring lines or marker buoys shall be utilized.
- Turbidity curtains and tethers shall be minimum length necessary, and shall remain deployed only as long as needed to properly accomplish the required task.
- Deployment sites shall be devoid of live corals, seagrass beds, or other significant resources.
- Work shall be performed during daylight hours to avoid disorienting nesting sea turtles due to nighttime construction lighting. If work is required after daylight working hours, sea-turtle-friendly lighting shall be used to reduce the brightness of the emitted light.
- From September through April, migratory birds protected under the Migratory Bird Treaty Act of 1917, may use the project site as a foraging, nesting, and resting ground. The protected species must not be harmed or harassed.
- Vegetation (habitat) clearing shall be minimized to the maximum extent possible.
- The contractor must consult with the Guam Division of Aquatic and Wildlife Resources at least 1 week prior to any vegetation removal action.
- Focused bird, tree snail, and bat surveys shall be performed prior to vegetation removal.
- Activities that result in sediment/pollutant discharges shall cease during the 21 day spawning moratorium (starting 7 to 10 days after the July full moon) for the primary hard coral spawning event each year. Contractor will contact NMFS for exact spawning dates.
- The Ajayan Bridge is located in the Achang Reef Flat Marine Protected Area (MPA). No take of marine organisms is allowed within this MPA. Any take to include killing, damaging, or wounding of marine organisms is a violation of local natural resource laws.
- Wetlands will be designated as Environmentally Sensitive Areas where no construction activities, equipment, or personnel are allowed.
- Appropriate materials to contain and clean potential spills shall be stored at the work site and be readily available. All project-related materials and equipment placed in the water shall be free of pollutants.
- The contractor shall perform daily pre-work equipment inspections for cleanliness and leaks. Heavy equipment operations shall be postponed or halted should a leak be detected, and shall not proceed until the leak is repaired and equipment cleaned.
- Off-site fueling sites shall be used to the maximum extent practical. Should fueling of project-related vehicles or equipment need to occur on-site a designated fueling area will be established at least 50 feet from the shoreline, river bank and wetlands. Project personnel shall be trained on proper fueling and fuel spill cleanup procedures.
- Stockpile, staging, and material storage areas shall be kept at least 50 feet from the shoreline, river bank, and wetlands.
- The contractor shall take appropriate precautions in advance of predicted typhoon events to prevent material losses during surge or flood events, such as relocating materials and equipment to be at least 50 feet from the shoreline and river bank.
- Hazardous materials and petroleum products shall be transported, used, and stored on-site in a manner to prevent contamination of soils and water.

- Spill kits including absorbent pads and other materials shall be readily available on-site.
- Turbidity and siltation from project-related work shall be minimized and contained through the appropriate use of erosion-control practices and effective silt containment devices (e.g., silt fencing and turbidity curtains), and the curtailment of work during adverse weather and tidal/flow conditions.
- An Environmental Protection Plan, Erosion Control Plan, Storm Water Pollution Prevention Plan, litter-control plan, Hazard Analysis and Critical Control Point Plan, and project-specific plans shall be prepared, approved by appropriate regulatory agencies, and implemented.
- Solid and sanitary waste disposal procedures and facilities shall be implemented.
- Erosion-control device(s) shall be employed at the job site to prevent debris and soil from entering the river. Device(s) must be secured and able to withstand heavy rains and winds.
- Catchment platforms and protective netting shall be installed under the bridge to keep debris from falling into the water.
- Construction debris must be removed immediately and not stored at the job site. Debris includes excavated soil, cement material, piping, and asphalt.
- Any material or debris removed from the aquatic environment shall be disposed of at upland sites in accordance with applicable laws and regulations.
- Dust-control devices or methodologies (wetting) must be employed at the job site during construction.
- Absorbent pads shall be readily available at the job site during heavy equipment operations, and equipment must be inspected for leaks prior to use.
- Work shall be conducted below the mean high water line during the dry season and low tides when feasible.
- All heavy equipment shall be kept out of the stream bed and disturbance of the existing stream bed shall be avoided.
- Impacts to strand vegetation along the shoreline shall be avoided to minimize beach erosion. Vegetation shall be replaced as soon as possible along both stream banks and shorelines.
- The Nypa palm community upstream of the bridge shall be avoided.
- River corridor access shall be maintained for aquatic species.
- Invasive species controls shall be maintained to ensure that all materials (human-created and natural) transported from off-site are free of such species (e.g., brown tree snake, rhino beetle, invasive plants).

**Determination of Effects**

The Ajayan Bay and Achang Reef Flat Marine Preserve provide foraging habitat for the federally threatened green sea turtle and the federally endangered hawksbill sea turtle. Ajayan Bay is not a known turtle nesting site. Therefore, sea turtle nesting is not anticipated. However, potentially suitable nesting habitat is present near the project. Given the results of the field surveys, the information provided by the NMFS, the USFWS, and the DAWR, the implementation of BMPs and other avoidance and minimization measures, we have determined that the proposed project "***may affect, but is not likely to adversely affect***" the federally threatened green sea turtle or the federally endangered hawksbill sea turtle.

The Achang Reef Flat Marine Preserve may support coral species which are candidates for listing under the ESA. The proposed action has the potential to generate turbidity and sediment which could impact corals. However, with implementation of BMPs and other avoidance and minimization measures, we have determined that the proposed project "***may affect, but is not likely to adversely affect***" candidate coral species.

We trust that we have provided you with the necessary information to evaluate the proposed project and respectfully request your concurrence with our determinations of effect for the federally threatened green sea turtle, the federally endangered hawksbill sea turtle and candidate coral species for ESA listing.

If you require additional information or have any questions, please do not hesitate to contact me via email at richelle.takara@fhwa.dot.gov or via telephone at (866) 233-8177 extension 2311.

Sincerely yours,

Richelle M. Takara

Richelle M. Takara, P.E.
Transportation Engineer

Enclosure:
1) Project Location Map
2) Photo Log
3) Proposed Geotechnical Soil Boring Locations
4) Bridge Profile
5) Traffic Control Plans
6) BMP Drawings
7) Achang Reef Flat Marine Preserve
8) June 2012 Response from NMFS
9) Flora and Fauna Surveys for the Ajayan Bridge Replacement Project

cc:
Carl V. Dominguez, DPW (via email)
Joaquin Blaz, DPW (via email)
Patrick Opay, NMFS (via email)
Don Hubner, NMFS (via email)
Jim Mischler, Parsons Brinckerhoff (via email)
Nora Camacho, Parsons Brinckerhoff (via email)
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**U.S. DEPARTMENT OF COMMERCE**
**National Oceanic and Atmospheric Administration**
**NATIONAL MARINE FISHERIES SERVICE**
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AUG 21 2014

Ms. Richelle M. Takara, P.E.
Department of Transportation
Federal Highway Administration
Hawaii Federal Aid Division
300 Ala Moana Blvd., Rm 3-306, Box 50206
Honolulu, Hawaii 96850

Dear Ms. Takara:

This letter responds to your July 23, 2014 letter regarding the proposal from the U.S. Federal Highway Administration (FHWA) and the Guam Department of Public Works (GDPW) to replace the Ajayan River Bridge on Route 4, Ajayan Bay, on the island of Guam (FHWA Project No. GQ-ER-0004(114)). The letter requested our concurrence under section 7 of the Endangered Species Act of 1973 (ESA), as amended (16 U.S.C. §1531 et seq.), with the FHWA determination that the proposed action is not likely to adversely affect ESA-listed green and hawksbill sea turtles and [proposed for listing] coral species.

Proposed Action/Action Area: The proposed action consists of FHWA funding the project that is described in your letter and its enclosures (FHWA 2014). In summary, contractors would operate land-based heavy equipment to demolish and remove the existing concrete bridge and its abutments. The new abutments would each be installed on 12 new 16.5-inch concrete piles driven between 10 and 20 feet upland from the former abutments along each bank. There would be no in-water pile driving, and in-water excavation would be limited to removal of the existing abutments and re-grading the bank between the existing abutments and the new abutments to a 3H:1V slope. The re-graded slope would be stabilized by grouted stone riprap. All riprap would be installed within the footprint of the original bridge and its abutments. Pre-cast concrete girders would be installed by crane between the new abutments. Temporary formwork would be installed on the girders and the new bridge deck would be cast-in-place. The project also includes some improvements to the adjacent road where it approaches the bridge. The project would take about 15 months to complete, and includes comprehensive best management practices (BMP) that include requirements to minimize and control erosion, sedimentation, and discharges. The action area for this project is estimated to be the in-water area within 50-yards around project-related activities, and the in-water extent of any plumes that may result from mobilized sediments or discharges of wastes or toxic chemicals such as fuels and/or lubricants associated with the machinery used for this activity.

Species That May Be Affected: Based on the project's location, scope, and timing, FHWA determined that the proposed action may affect but is not likely to adversely affect green sea turtles (*Chelonia mydas*) and hawksbill sea turtles (*Eretmochelys imbricata*). FHWA also determined that the proposed action may affect any of the 35 species of corals that have been proposed for listing under the ESA and are found in the waters of Guam. Detailed information to describe the biology, habitat, and conservation status for sea turtles and corals can be found in the recovery plans and other sources at http://www.nmfs.noaa.gov/pr/species/turtles/, and http://www.nmfs.noaa.gov/pr/species/invertebrates/, respectively.

Critical Habitat: There is no designated or proposed critical habitat under National Marine Fisheries Service (NMFS) jurisdiction within or adjacent to the action area.

Analysis of Effects: In order to determine that a proposed action is not likely to adversely affect listed species, NMFS must find that the effects of the proposed action are expected to be insignificant, discountable, or beneficial as defined in the joint USFWS-NMFS Endangered Species Consultation Handbook: (1) insignificant effects relate to the size of the impact and should never reach the scale where take occurs; (2) discountable effects are those that are extremely unlikely to occur; and (3) beneficial effects are positive effects without any adverse effects (USFWS & NMFS 1998). This standard, as well as consideration of the probable duration, frequency, and severity of potential interactions, was applied during the analysis of effects of the proposed action on ESA-listed and proposed-for-listing marine species, as is described in detail in the FHWA consultation request. In the request, the FHWA determined that the risk of: direct physical impact and loss of forage would be discountable. The FTA further determined that that project-related, disturbance from human interaction, as well as exposure to elevated noise levels, artificial lighting, turbidity, and wastes and discharges would result in insignificant effects.

Based on consideration of the record, NMFS agrees with the FHWA that the proposed action would have insignificant impacts, or the likelihood of impacts would be discountable, for the sea turtles and corals considered in this consultation.

Conclusion: NMFS concurs with your determination that the proposed replacement of the Ajayan River Bridge on route 4, Guam is not likely to adversely affect ESA-listed and proposed-for-listing marine species. Our concurrence is based on the finding that the effects of the proposed action are expected to be insignificant, discountable, or beneficial as defined in the joint USFWS-NMFS Endangered Species Consultation Handbook (USFWS-NMFS 1998) and summarized at the beginning of the Analysis of Effects section above. This concludes your consultation responsibilities under the ESA for species under NMFS's jurisdiction. However, this consultation focused solely on compliance with the ESA. Any additional compliance review that may be required of NMFS for this action (such as assessing impacts on Essential Fish Habitat) would be completed by NMFS Habitat Conservation Division in separate communication, if applicable.

ESA Consultation must be reinitiated if: 1) a take occurs; 2) new information reveals effects of the action that may affect listed species or designated critical habitat in a manner or to an extent not previously considered; 3) the identified action is subsequently modified in a manner causing effects to listed species or designated critical habitat not previously considered; or 4) a new species is listed or critical habitat designated that may be affected by the identified action.

If you have further questions please contact Donald Hubner on my staff at (808) 725-5145. Thank you for working with NMFS to protect our nation's living marine resources.

Sincerely,

Michael D. Tosatto
Regional Administrator

cc: Dan Polhemus, Aquatic Ecosystems Conservation, USFWS, Honolulu
Ryan Winn, Regulatory Branch, US Army Corps of Engineers, Honolulu
Carl Dominguez, Guam Department of Public Works
Joaquin Blaz, Guam Department of Public Works

NMFS File No. (PCTS): PIR-2014-9523
PIRO Reference No.: I-PI-14-1203-LVA

Literature Cited

Federal Highway Administration (FHWA). 2014. ESA consultation request letter, re. Proposed funding to the Guam Department of Public Works to replace the Ajayan River Bridge on Route 4, Guam (FHWA Project No. GQ-ER-0004(114)). U.S. Department of Transportation, FHWA, Honolulu, HI. July 23, 2014. 28 pp.

U.S. Fish and Wildlife Service and National Marine Fisheries Service (USFWS). 1998. Endangered Species Consultation Handbook. Procedures for Conducting Consultation and Conference Activities Under Section 7 of the Endangered Species Act. http://www.nmfs.noaa.gov/pr/pdfs/laws/esa_section7_handbook.pdf

## G.8 National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Pacific Islands Regional Office, Habitat Conservation Division - Essential Fish Habitat Consutlation

U.S. Department of Transportation
**Federal Highway Administration**

**Hawaii Federal-Aid Division**

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July 29, 2014

In Reply Refer To:
HDA-HI

**Mr. Gerry Davis**
**Assistant Regional Administrator - Habitat Conservation**
**National Marine Fisheries Service**
**Pacific Islands Regional Office**
**NOAA Inouye Regional Center**
**1845 Wasp Blvd., Building 176**
**Honolulu, HI 96818**

**Subject: Route 4 Ajayan Bridge Replacement,**
**Project No. GQ-ER-0004(114)**
**Essential Fish Habitat Consultation**

Dear Mr. Davis:

The U.S. Department of Transportation, Federal Highway Administration (FHWA), in close coordination with the Guam Department of Public Works (DPW), proposes to replace the existing Ajayan River Bridge located on Route 4, on the boundary between Merizo and Inarajan. A Categorical Exclusion document for compliance with the National Environmental Policy Act (NEPA) is being prepared for the Route 4 Ajayan Bridge Replacement Project (Project No. GQ-ER-0004(114)).

We are contacting you to initiate consultation regarding Essential Fish Habitat (EFH) for the above-referenced project.

**Ajayan Bridge Existing Condition**

The Ajayan Bridge is located on Route 4 on the boundary between Merizo and Inarajan. The bridge provides two lanes that cross the Ajayan River just upstream of the river mouth as it enters the ocean (Enclosure 1 – Project Location Map).

The existing single-span cast-in-place concrete box girder bridge was constructed in 1968, with a span length of approximately 76.2 feet and a skew of 40 degrees. Abutments are founded on concrete piles; the deck has an asphalt concrete wearing surface. The most recent bridge inspection report, dated May 27, 2004, noted that the substructure and channel are rated in serious condition. The damage noted includes cracking and differential movement of substructure units and significant scour at abutments (Enclosure 2 – Photo Log).

**Project Description**

The existing bridge will be demolished and replaced with a new 40-foot-wide by 105-foot-long bridge. The proposed improvements include two 12-foot-wide lanes and two 8-foot-wide paved shoulders. Roadway alignment and grade will match the existing at the point of tie-in.

To accommodate traffic while the new bridge is being constructed, the bridge will be demolished in two phases, demolishing one side (longitudinally) of the bridge at a time. This will allow two-way traffic (one lane, controlled by traffic lights) to use the bridge during demolition and construction.

The project will entail the demolition and removal of the existing bridge structure and existing pile caps. The existing piles below the waterline will be cut and capped at the mudline, but left in-place. This will provide for minimal disturbance of the aquatic ecosystem. Roadway work within the project limits will include removal of the existing pavement, full-depth pavement replacement, and replacement of the guardrails. The proposed action will also include geotechnical sampling, testing, and analysis. As shown in Enclosure 3 – Proposed Geotechnical Soil Boring Locations, soil borings for bridge foundations will be taken at two locations, one at each proposed substructure unit, to a depth of at least 100 feet or at least 10 feet into competent bedrock, whichever is shallower. Additionally, two shallow borings to a depth of 15 feet will be taken within the roadway approach area.

**Demolition and Construction Methods**

Demolition

Bridge demolition will include removal of the existing bridge deck, box beam, abutments, wing walls, guardrails, and parapet. The existing bridge is approximately 29.6 feet wide and will be demolished in two phases to allow for one lane to remain open for traffic. Phase 1 will include saw-cutting the westbound portion of the existing bridge and removing it by crane. Phase 2 will include the same actions to the eastbound portion of the existing bridge. Before demolition and removal, a temporary concrete barrier will be installed on the existing bridge, and existing utilities will be temporarily relocated to the opposite portion of the bridge during each phase.

Demolition of the existing abutment walls will be accomplished by use of jackhammers and/or hoe rams, and removed via mechanical equipment such as a backhoe. The existing bridge abutments will be demolished and the existing piles will be cut down to the river bed. The soil between the old abutment and new abutment will be excavated, and 48-inch-thick grouted riprap will be placed on a gradual slope from the new abutment to the remaining old pilings (Enclosure 4 – Bridge Profile). A combined total of approximately 540 cubic yards of soil and concrete abutment wall material will be excavated from below the mean high water (MHW) line of the Ajayan River. The combined total linear disturbance to the stream channel from the excavation of the soil and concrete abutment wall material will be approximately 407 linear feet.

Construction

Construction of the new bridge will also be performed in two phases so that two-way signal-controlled traffic can be maintained in one lane during construction. Phase 1 will include demolition of the existing westbound portion of the bridge and construction of the new westbound portion of the bridge. During Phase 1, utilities and two-way signal-controlled traffic will be temporarily relocated to the eastbound portion of the existing bridge. Phase 2 will include demolition of the existing eastbound portion of the bridge and construction of the new eastbound portion of the bridge. During Phase 2, utilities will be permanently installed in the westbound portion of the new bridge, and two-way signal-controlled traffic will be temporarily relocated to the westbound portion of the new bridge. Work areas for Phase 1 and Phase 2 are shown in Enclosure 5 – Traffic Control Plans.

A new bridge foundation will be constructed inland, or behind, the existing abutment to minimize disturbance to the river channel. The proposed abutments will be set back from the existing abutments. The soil and grouted riprap between the remaining existing piles and the new abutment will be sloped back at a 3H:1V ratio. The two new abutments will be constructed at the top of the slope and supported by twelve piles (per abutment), for a combined total of twenty-four new octagonal 16.5-inch-diameter

concrete piles (100 tons per pile). The new abutments and abutment piles will be constructed above the MHW line.

Approximately 947 cubic yards of grouted stone riprap will be placed along the abutment walls, below the MHW line, to protect the abutment from erosion caused by waves. The riprap (fill material) will be placed along approximately 401 linear feet of stream channel. The riprap will be placed within the excavation footprint and will not impact additional areas of the stream channel.

Best Management Practices

Best management practices (BMPs) will include catchment platforms and protective netting, silt screen fences, and turbidity curtains. Catchment platforms and protective netting will be installed under the bridge to keep debris from falling into the water. Silt screen fences will be placed at the slope toe around the river edges to prevent erosion and rubbish from going into the water. Turbidity curtains will be installed at both river banks surrounding the work areas to prevent the spread of silt and sediment into the river and bay (Enclosure 6 – BMP Drawings).

**Natural Environments**

The proposed project is located within the southern end of Guam, which is characterized by hilly volcanic slopes descending from approximately 800 feet in elevation to sea level over distances of less than 2.5 miles. The project site is situated between the Inarajan and Manell watersheds. The Ajayan Bridge is situated on the southern end of the Ajayan River, adjacent to the Ajayan Bay discharge point. Flora and fauna surveys of the proposed project area were conducted by SWCA Environmental Consultants (SWCA) on November 6 and 7, 2013. During these surveys, emphasis was placed on identifying special-status species. The following paragraphs describe the existing terrestrial and aquatic environments that occur within the proposed project area as reported by SWCA and Guam Department of Agriculture, Division of Aquatic and Wildlife Resources (DAWR).

Terrestrial Ecology

Forest surrounding the project area consists mostly of secondary thicket/scrub forest with some ravine forest. Areas of forested palustrine wetlands are located along the east and west banks of the Ajayan River. Several typhoons that occurred between the 1970s and 1990s changed the vegetation in the area dramatically. Site visits conducted by Guam DAWR staff in February and March 2013 found that pago (*Hibiscus tiliaceus*) and tangantangan (*Leucaena leucocephala*) were the two common species in the project area.

During flora surveys performed by SWCA on November 6 and 7, 2013, a total of 19 plants were identified to either genera or species. The seven native plants documented consisted of five trees (pago, *Pandanus tectorius*, *Bougainvillea glabra*, *Callicarpa candicans*, and *Morinda citrifolia*), one fern (*Polypodium scolopendria*), and one grass (*Saccharum spontaneum*). The non-native plants documented were pugua (*Areca catechu*), coconut trees (*Cocos nucifera*), beggar's tick (*Bidens alba*), Siam weed (*Chromolaena odorata*), mile-a-minute vine (*Mikania scanden*), daok (*Calophyllum inophyllum*), papaya (*Carica papaya*), tangantangan, kamachile (*Pithecellobium dulce*), and *Musa* sp.

Shoreline Ecology

The project area is located at the mouth of the Ajayan River as it discharges into Achang Reef Flat. The shoreline vegetation is composed primarily of coconut trees, pago, and tangantangan.

Although not located within the boundaries of the project area, a small Nypa palm (*Nypa fruticans*) (also referred to as "Nipa") community was identified approximately 10 meters upstream of the Ajayan River. This species is a wetland obligate and grows in brackish marshes.

Aquatic Ecology

The Ajayan River flows south and discharges at the Ajayan Bay. The Ajayan Bay includes the eastern portion of the Achang Reef Flat Marine Preserve (Enclosure 7 – Achang Reef Flat Marine Preserve). The Ajayan River channel cuts completely through the reef flat at Ajayan Bay. The reef flat consists of inner and outer reef flats that are exposed at low tide. Mangroves and sea grass beds are present in the vicinity of the project site.

According to the University of Guam Marine Laboratory's Guam Coastal Atlas (www.guammarinelab.com/coastal.atlas/htm/Maps.htm), the benthic habitat of the river channel is composed of "sand, uncolonized 90% to 100%", extending from inland waters to 500 meters offshore. The benthic habitat to the east of the channel is composed of "spur and groove, coral 10% to <50%" near the shore, and "pavement, turf 50% to <90%" after approximately 100 meters offshore. The benthic habitat to the west of the channel is composed of "spur and groove, coral 50% to <90%" near the shore, and "pavement, coral 10% to <50%" after approximately 50 meters offshore.

The Achang Reef Flat supports primarily hard corals. Only limited cover of two soft coral species have been identified by the University of Guam Marine Lab during monitoring of the site.

Achang Reef Flat is classified as M-1, Excellent. Waters in this category are suitable for whole-body contact and recreation. These waters are also needed for research and to ensure the preservation and protection of marine life, including coral, reef-dwelling organisms, fish, and related resources, and aesthetic enjoyment. The surface waters of the Ajayan River are classified as S-3, Low. Waters in this category are used primarily for commercial, agriculture, or industrial activity. Aesthetic enjoyment and recreational body contact are limited. Maintenance of aquatic life is also limited.

Four sea turtle species occur in the coastal waters surrounding Guam. The green sea turtle (*Chelonia mydas*) and loggerhead sea turtle (*Caretta caretta*) are federally and locally listed as threatened. The Hawksbill sea turtle (*Eretmochelys imbricate*) and leatherback sea turtle (*Dermochelys coriacea*) are federally and locally listed as endangered. Turtle nesting areas have been identified at Ritidian National Wildlife Refuge, Haputo, Urunao, Tumon Bay, Cabras Island, Spanish Steps, Cocos Island, Acho Bay, Nomña Bay, Jinapsan, Taragüe Beach, and the waterfront annex of Naval Base Guam. Acho Bay is located approximately one mile (1.6 kilometers) from the project site. Turtle nesting areas are not present at the project site; however, sea turtles have been observed foraging in Ajayan Bay.

**Compliance with the Marine Mammal Protection Act**

The Marine Mammal Protection Act (MMPA) prohibits, with certain exceptions, the "take" of marine mammals in U.S. waters and by U.S. citizens on the high seas, and the importation of marine mammals and marine mammal products into the U.S. All marine mammals are protected under the MMPA. Under the MMPA, take is defined as "harass, hunt, capture, kill, or collect, or attempt to harass, hunt, capture, kill, or collect."

Of the animals listed in Enclosure 8 – Marine Protected Species of the Mariana Islands that could occur within the waters off Guam, humpback whales (*Megaptera novaeangliae*) and sperm whales (*Physeter macrocephalus*) are protected species under the Endangered Species Act and MMPA. Spinner dolphins (*Stenella longirostris*) are also known to occur in nearshore waters around Guam, but are protected under the MMPA only.

**Compliance with Magnuson Stevens Act – Essential Fish Habitat**

The Magnuson-Stevens Fisheries Conservation and Management Act 1976 was implemented to conserve and manage fishery resources, encourage and support international fishery agreements, promote responsible commercial and recreational fishing, and provide for fishery management

planning. In 1996, the act was amended to address protection, conservation, and enhancement of fish habitat. The 2009 Fishery Ecosystem Plan (FEP) for the Mariana Archipelago addresses managing EFH in four place-based categories: Bottom Fish and Seamount Management Unit Species (MUS), Crustacean MUS, Precious Coral MUS, and Coral Reef Ecosystem MUS.

The FEP for the Mariana Archipelago states that the Western Pacific Regional Fishery Management Council defines the Mariana Archipelago FEP boundary as including all waters and associated marine resources within the 200-mile Exclusive Economic Zone (EEZ) surrounding the Northern Mariana Islands and Guam. This implies inclusion of species under the Pacific Pelagic MUS managed under the Pacific Pelagic FEP. EFH is subsequently defined as those waters and substrate, within the EEZ, necessary for fish to spawn, breed, or growth to maturity.

**Project Effects on Essential Fish Habitat**

Bottom Fish and Seamount MUS

Areas considered EFH for adult and juvenile bottom fish are the water column and bottom habitat extending from the shoreline to a depth of 400 meters, encompassing steep drop-offs and high-relief habitats. EFH for bottom fish eggs and larvae is defined as the water column from the shoreline to the outer boundary of the EEZ (200 miles) to a depth of 400 meters.

Species in this management unit are reported to be concentrated on the steep slopes of deep-water banks. Banks and seamounts occur on the continental shelf and in oceanic waters. In general, the deep-water bottom fish species included in this unit occur at great distances from the project site. However, some shallow-water bottom fish (0 to 100 meters), such as the giant trevally (*Caranx ignobilis*), are known to use mangrove/estuarine environments at different stages in their life cycle.

Project activities would not measurably impact, directly or indirectly, preferred habitat for the species included in the Bottom Fish and Sea Mount MUS, provided routine in-water/near-water-related construction BMPs to safeguard water quality and the environment are employed. Therefore, a ***no-adverse-effect*** determination is recommended relative to the proposed project and its potential to impact EFH for the Bottom Fish and Sea Mount MUS.

Crustacean MUS

EFH for the Crustacean MUS is subdivided into three main groups; (1) deepwater shrimp, (2) spiny and slipper lobster complex, and (3) Kona crab.

EFH for deepwater shrimp for eggs and larvae is the water column on the outer reef slopes between 550 and 700 meters in depth. For juvenile and adult deepwater shrimp it is defined as the outer reef slopes between 300 and 700 meters in depth. Project activities within or near the Ajayan River would not affect EFH for deepwater shrimp.

EFH for spiny and slipper lobster complex and Kona crab consists of the water column from the shoreline to the EEZ to a depth of 150 meters (eggs and larvae) and from the shoreline to a depth of 100 meters (juveniles and adults). Banks with summits less than 30 meters from the surface have been designated as Habitat Areas of Particular Concern for the spiny and slipper lobster complex and Kona crab. These banks have been shown to support recruitment of juvenile spiny lobster, provide ecological function, and are a rare habitat type susceptible to human-induced degradation. Spiny lobsters are typically found in rocky substrate in well-protected areas. These lobsters are typically found in association with coral reefs, inhabiting the rocky shelters of windward surf zones and moving on to the reef flat at night to forage.[1]

1 Western Pacific Regional Fishery Management Council. 2009. Fishery Ecosystem Plan for the Mariana Archipelago.Western Pacific Regional Fishery Management Council, Honolulu, Hawaii.

The project area and nearby banks of Ajayan Bay have banks with summits less than 30 meters. Project activities including excavation and fill of the stream channel would directly affect Crustacean MUS Habitat Areas of Particular Concern. Elevated turbidity resulting from in-water shoreline excavation and fill activities can also result in temporary indirect impacts to water quality of EFH for spiny and slipper lobster complex and Kona crab. In addition, potential indirect impacts to Coral Reef Ecosystem MUS described below, can affect crustaceans which forage on the reef flat.

Although there may be an effect to the EFH for the Crustacean MUS, the project will likely not adversely affect EFH given that routine in-water/near-water-related construction BMPs will be used to safeguard water quality and the environment. Therefore, a determination of ***may adversely affect*** Crustacean MUS EFH is recommended.

Precious Coral MUS

According to the FEP for the Mariana Archipelago, precious coral species are found in marine waters between 10 and 750 fathoms (19 and 1372 meters). The project vicinity does not feature the depth, bottom substrate, or current/water quality conditions conducive to precious coral growth. There are no known precious coral beds, such as those identified in Hawaiian waters, in the waters around Guam. No Precious Corals MUS EFH has been established in the Mariana Archipelago. Consequently, a ***no-adverse-effect*** determination is recommended relative to the proposed project and its potential to impact EFH for the Precious Coral MUS.

Coral Reef Ecosystem MUS

EFH has been defined for the Coral Reef Ecosystem MUS as being the water column and all benthic substrate to a depth of 50 fathoms (41 meters) from the shoreline to the outer limit of the EEZ. Most coral reef ecosystem taxa use estuarine environments, seagrass beds, and mangrove habitats (Nypa palm communities are considered a type of mangrove complex) during juvenile, adult, and spawning life stages.

The proposed project will not alter the Nypa palm community directly upstream of the bridge. No new permanent bridge supporting structures will be constructed in the water, and, thus, the permanent in-water bridge footprint will not be changed. Existing piles in the water will be cut, capped, and left in-place. Should temporary in-water piles be required to support falsework during construction, the piles will be completely removed. Benthic habitat will not be permanently altered. Therefore, the construction will not constitute barriers to Coral Reef Ecosystem MUS species. There will be no direct destruction of or impacts to mangrove, seagrass beds, or living coral.

Elevated turbidity resulting from in-water shoreline excavation and fill activities can result in indirect impacts to seagrass and coral. Seagrass and coral are dependent on water quality, water clarity, and light penetration. Water quality in the river, the adjacent Nypa palm community, seagrass beds, coral reef, and the bay waters at the river mouth must be protected from significant sources of pollution, sedimentation, and turbidity. This will be accomplished through the use of construction BMPs to safeguard water quality and the environment. The use of screens and nets to catch any debris and the use of turbidity curtains to isolate active near-water and in-water work areas will significantly mitigate potential water-quality impacts. Strict adherence to standard BMPs for in-water and near-water work will help mitigate the threat of pollution to the water column, including the introduction of sediment and turbidity, during bridge construction and demolition activities. Therefore, given the implementation of the BMPs mentioned above, a ***determination of may adversely affect the*** Coral Reef Ecosystem MUS EFH is recommended.

Pacific Pelagic MUS

EFH for the numerous pelagic species can be considered broadly and includes virtually all offshore marine waters adjacent to Guam. Although the majority of species in the Pacific Pelagic MUS typically are found in deeper waters, several may use shallower waters during different life stages. With a few exceptions, most of these species forage within the water column and rarely feed off the bottom. The proposed bridge replacement project site and adjacent areas are not considered EFH for the Pacific Pelagic MUS. Consequently, a ***no-adverse-effect*** determination is recommended relative to the proposed project and its potential to impact EFH for the Pacific Pelagic MUS.

Habitat Areas of Particular Concern

Habitat Areas of Particular Concern (HAPC) are identified as those areas within EFH that are essential to the life cycle of important coral species. Five HAPC have been established in Guam: Cocos Lagoon, Orote Point Ecological Reserve Area (ERA), Haputo ERA, Ritidian Point, and Jade Shoals in Apra Harbor. The proposed project area and adjacent waters are spatially separated from these HAPC resources. Therefore, a ***no-adverse-effect*** determination is recommended relative to the proposed project and its potential to impact an HAPC.

**Agency Coordination**

On May 31, 2012, AECOM requested species information from the U.S. Fish and Wildlife Service (USFWS) regarding the potential presence of protected species occurring within the proposed project area. On June 12, 2012, USFWS responded to an AECOM request via email, recommending that a survey be conducted for Mariana common moorhen (*Gallinula choropus guami*) and that it be determined if sea turtle nesting beaches are located near the project area. USFWS also noted that there is no proposed or designated critical habitat in the vicinity of the proposed project area.

The DAWR was consulted on this project. In addition to comments about birds and terrestrial species, the DAWR also noted that there is a potential for sea turtles to occur in the waters near the project area. There is also a small strand of beach near the bridge where turtles could potentially come ashore, although it is not a known turtle nesting site. DAWR requested a survey be performed for the presence/absence of special-status species.

In addition, at AECOM's request for species information, the National Marine Fisheries Service (NMFS) provided documentation, via email dated June 4, 2012, regarding the federally threatened and endangered species (i.e., protected species) known to occur and/or potentially known to occur within the proposed project area. In the correspondence, Donald Hubner, NMFS Endangered Species Biologist – Pacific Islands Regional Office, stated that the only federally protected species under NMFS jurisdiction that is likely to occur at or near the proposed project area is the threatened green sea turtle and the endangered hawksbill sea turtle.

On September 5, 2012, as advised by Donald Hubner, AECOM contacted Valerie Brown, NMFS Fishery Biologist – Pacific Islands Regional Office/Guam Field Office, via telephone to discuss species of concern and EFH in the project area. Valerie Brown provided and suggested AECOM review the EFH consultation letter and NMFS recommendations for the Agfayan Bridge Project. For further coordination, a description of the Ajayan Bridge Project was provided to Donald Hubner and Valerie Brown.

At AECOM's request, Valerie Brown provided resources for an ecological description and information regarding EFH in the project area, via email dated May 6, 2013.
Ms. Brown noted:

1. The project site is in the Achang Reef Flat Marine Preserve, which includes significant fish population dependent on healthy habitat.

2. The project site is EFH for all of the MUS for the Western Pacific, but coral reef and crustacean MUS are the most likely to be impacted by this project.
3. The project site includes an estuary, seagrass beds, and coral reefs. The seagrasses and corals can be significantly impacted by sediment and project design, phasing, and BMPs should have a strong focus on preventing sediment impacts to the adjacent habitats.

As requested by the various agencies, flora and fauna surveys were completed for this project. SWCA performed the flora and fauna survey and their report is included as Enclosure 9 – Flora and Fauna Surveys for the Ajayan Bridge Replacement Project.

**Avoidance and Minimization Measures**

To avoid and minimize potential impacts, the FHWA and DPW developed numerous BMPs that will be implemented for the proposed project. Drainage concepts will conform to the Guam Transportation Stormwater Manual. BMPs will be required to control erosion during construction, including catchment platforms, protective netting, silt screen fences, and turbidity curtains. The BMPs are shown in the figures in Enclosure F. Additional BMPs are detailed in Table 1. These BMPs include recommendations from agency consultations to-date (i.e. USFWS, NMFS, and Guam DAWR).

**Project BMPs and Avoidance & Mitigation Measures**

- The contractor will designate a competent observer to survey the areas adjacent to the proposed action for Green Sea Turtles and Hawksbill Sea Turtles prior to the start of work each day and prior to resumption of work following any break of more than 30 minutes when work is above or in the water when there is a potential to directly impact Green Sea Turtles and Hawksbill Sea Turtles.
- If a Green Sea Turtle or a Hawksbill Sea Turtle is discovered within 50 yards of the proposed work activities with the potential to impact or disturb species shall be postponed or halted. Work shall only begin/resume after the animals have voluntarily departed the area.
- Special attention shall be given to verify that no Green Sea Turtles or Hawksbill Sea Turtles are in areas where equipment or materials are expected to contact the substrate before that equipment may enter the water.
- All objects that are to be placed in the river, such as turbidity curtains, riprap, and excavator bucket, shall be lowered to the bottom in a controlled manner. This can include the use of cranes, winches, or other equipment that affect positive control over the rate of decent to minimize turbidity potential.
- No marine vessels, boats, mooring lines or marker buoys shall be utilized.
- Turbidity curtains and tethers shall be minimum length necessary, and shall remain deployed only as long as needed to properly accomplish the required task.
- Deployment sites shall be devoid of live corals, seagrass beds, or other significant resources.
- Work shall be performed during daylight hours to avoid disorienting nesting sea turtles due to nighttime construction lighting. If work is required after daylight working hours, sea-turtle-friendly lighting shall be used to reduce the brightness of the emitted light.
- From September through April, migratory birds protected under the MBTA of 1917, may use the project site as a foraging ground. The protected species must not be harmed or harassed.

- Activities that result in sediment/pollutant discharges shall cease during the 21 day spawning moratorium (starting 7 to 10 days after the July full moon) for the primary hard coral spawning event each year. Contractor will contact NMFS for exact spawning dates.
- In-water work shall stop during coral spawning.
- The Ajayan Bridge is located in the Achang Reef Flat Marine Protected Area (MPA). No take of marine organisms is allowed within this MPA. Any take to include killing, damaging, or wounding of marine organisms is a violation of local natural resource laws.
- Appropriate materials to contain and clean potential spills shall be stored at the work site and be readily available. All project-related materials and equipment placed in the water shall be free of pollutants.
- The contractor shall perform daily pre-work equipment inspections for cleanliness and leaks. Heavy equipment operations shall be postponed or halted should a leak be detected, and shall not proceed until the leak is repaired and equipment cleaned.
- Off-site fueling sites shall be used to the maximum extent practical. Should fueling of project-related vehicles or equipment need to occur on-site a designated fueling area will be established at least 50 feet from the shoreline, river bank and wetlands. Project personnel shall be trained on proper fueling and fuel spill cleanup procedures.
- Stockpile, staging, and material storage areas shall be kept at least 50 feet from the shoreline, river bank, and wetlands.
- The contractor shall take appropriate precautions in advance of predicted typhoon events to prevent material losses during surge or flood events, such as relocating materials and equipment to be at least 50 feet from the shoreline and river bank.
- Hazardous materials and petroleum products shall be transported, used, and stored on-site in a manner to prevent contamination of soils and water.
- Spill kits including absorbent pads and other materials shall be readily available on-site.
- Turbidity and siltation from project-related work shall be minimized and contained through the appropriate use of erosion-control practices and effective silt containment devices (e.g., silt fencing and turbidity curtains), and the curtailment of work during adverse weather and tidal/flow conditions.
- An Environmental Protection Plan, Erosion Control Plan, Storm Water Pollution Prevention Plan, and project-specific plans shall be prepared, approved by appropriate regulatory agencies, and implemented.
- Solid and sanitary waste disposal procedures and facilities shall be implemented.
- Erosion-control device(s) shall be employed at the job site to prevent debris and soil from entering the river. Device(s) must be secured and able to withstand heavy rains and winds.
- Construction debris must be removed immediately and not stored at the job site. Debris includes excavated soil, cement material, pipings, and asphalt.
- Dust-control devices or methodologies (wetting) must be employed at the job site during construction.
- Absorbent pads shall be readily available at the job site during heavy equipment operations, and equipment must be inspected for leaks prior to use.

- Work shall be conducted below the mean high water line during the dry season and low tides when feasible.
- All heavy equipment shall be kept out of the stream bed and disturbance of the existing stream bed shall be avoided.
- Impacts to strand vegetation along the shoreline shall be avoided to minimize beach erosion. Vegetation shall be replaced as soon as possible along both stream banks and shorelines.
- Vegetation (habitat) clearing shall be minimized to the maximum extent possible.
- The contractor must consult with the Guam Division of Aquatic and Wildlife Resources at least 1 week prior to any vegetation removal action.
- The Nypa palm community upstream of the bridge shall be avoided.
- River corridor access shall be maintained for aquatic species.
- Invasive species controls shall be maintained to ensure that all materials (human-created and natural) transported from off-site are free of such species (e.g., brown tree snake, rhino beetle, invasive plants).

The determinations of effect on EFH for federally managed species is based on information reviewed for EFH within the range of influence of the proposed project and in coordination with Ms. Valerie Brown.

We trust that we have provided you with the necessary information to evaluate the proposed project and respectfully request your concurrence with the determination of effects as outlined above. Furthermore, given the information provided and based on the determination of effects for EFH, we request for an abbreviated EFH consultation with NMFS for this project. We look forward to your response.

If you require additional information or have any questions, please contact me at (808) 541-2311 or richelle.takara@fhwa.dot.gov.

Sincerely yours,

Richelle M. Takara

Richelle M. Takara, P.E.
Transportation Engineer

Enclosure:
1) Project Location Map
2) Photo Log
3) Proposed Geotechnical Soil Boring Locations
4) Bridge Profile
5) Traffic Control Plans
6) BMP Drawings
7) Achang Reef Flat Marine Preserve
8) June 2012 Response from NMFS
9) Flora and Fauna Surveys for the Ajayan Bridge Replacement Project

cc:
Carl V. Dominguez, DPW (via email)
Joaquin Blaz, DPW (via email)
Patrick Opay, NMFS (via email)
Don Hubner, NMFS (via email)
Jim Mischler, Parsons Brinckerhoff (via email)
Nora Camacho, Parsons Brinckerhoff (via email)
Nemencio Macario, N.C. Macario (via email)

RT____



**U.S. DEPARTMENT OF COMMERCE**
**National Oceanic and Atmospheric Administration**
NATIONAL MARINE FISHERIES SERVICE
Pacific Islands Regional Office
1845 Wasp Blvd., Bldg 176
Honolulu, Hawaii 96818
(808) 725-5000 • Fax: (808) 973-2941

Ms. Richelle Takara
Federal Highway Administration
Hawaii Federal-Aid Division
300 Ala Moana Blvd, Rm 3-306
Box 50206
Honolulu, HI 96850

May 13, 2015

Dear Ms. Takara:

The National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NMFS) has reviewed the project material provided by the U.S. Department of Transportation, Federal Highway Administration (FHWA), for the Ajayan Bridge Replacement Project (Project No. GQ-ER-0004(114)), on the boundary between Merizo and Inarajan, Guam. We appreciate the opportunity to provide the following comments in accordance with the EFH provision §305(b) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA; 16 USC §1855) and the Fish and Wildlife Coordination Act (FWCA).

This project will demolish the existing bridge and replace it with a new 40-foot-wide by 105-foot-long Bridge. Roadway alignment and grade will match the existing at the point of tie-in. To accommodate traffic while the new bridge is being constructed, the bridge will be demolished in two phases, demolishing one side (longitudinally) of the bridge at a time. This will allow two-way traffic (one lane, controlled by traffic lights) to use the bridge during demolition and construction. The project will entail the demolition and removal of the existing bridge structure and existing pile caps. The existing piles below the waterline will be cut and capped at the mudline, but left in-place to minimize disturbance of the aquatic ecosystem. Roadway work within the project limits will include removal of the existing pavement, full-depth pavement replacement, and replacement of the guardrails. The proposed action will also include geotechnical sampling, testing, and analysis.

During the demolition phase of the project, the existing bridge abutments will be demolished and the existing piles will be cut down to the river bed. The soil between the old abutment and new

abutment will be excavated, and 48-inch-thick grouted riprap will be placed on a gradual slope from the new abutment to the remaining old pilings. A combined total of approximately 540 cubic yards of soil and concrete abutment wall material will be excavated from below the mean high water (MHW) line of the Ajayan River. The combined total linear disturbance to the stream channel from the excavation of the soil and concrete abutment wall material will be approximately 407 linear feet. A new bridge foundation will be constructed inland of the existing abutment to minimize disturbance to the river channel. The soil and grouted riprap between the remaining existing piles and the new abutment will be sloped back at a 3H:1V ratio. The two new abutments will be constructed at the top of the slope and supported by twelve piles (per abutment), for a combined total of twenty-four new octagonal 16.5-inch-diameter concrete piles (100 tons per pile). The new abutments and abutment piles will be constructed above the MHW line. Approximately 947 cubic yards of grouted stone riprap will be placed along the abutment walls, below the MHW line, to protect the abutment from erosion caused by waves. The riprap (fill material) will be placed along approximately 401 linear feet of stream channel. The riprap will be placed within the excavation footprint and will not impact additional areas of the stream channel.

NMFS appreciates FHWA's efforts to consult with us early on this project to minimize the predicted direct impact to our trust resources. Despite these efforts, we determine that adverse effects to EFH will still occur. As such, we offer the following comments in accordance with the EFH provision of the MSA (50 C.F.R. § 600.905 – 930), also the National Environmental Policy Act (42 U.S.C. 4321 et seq.),

**Magnuson-Stevens Act**

Pursuant to the MSA, the Secretary of Commerce, through NMFS, is responsible for the conservation and management of fishery resources found off the coasts of the United States. *See* 16 U.S.C. 1801 *et seq.* Section 1855(b)(2) of the MSA requires federal agencies to consult with NMFS, with respect to "any action authorized, funded, or undertaken, or proposed to be authorized, funded, or undertaken, by such agency that may adversely affect any essential fish habitat identified under this Act." The statute defines EFH as "those waters and substrates necessary to fish for spawning, breeding, feeding or growth to maturity." 16 U.S.C. 1802(10). Adverse effects on EFH are defined further as "any impact that reduces the quality and/or quantity of EFH," and may include "site-specific or habitat-wide impacts, including individual, cumulative or synergistic consequences of actions." 50 C.F.R. § 600.810(a). The consultation process allows NMFS to make a determination of the project's effects on EFH and provide Conservation Recommendations to the lead agency on actions that would adversely affect such habitat. *See* 16 U.S.C. 1855(b)(4)(A).

**Essential Fish Habitat**

The marine water column, seafloor, and tidally influenced stream areas in the project area are designated as Essential Fish Habitat (EFH) and support various life stages for the management unit species (MUS) identified under the Western Pacific Regional Fishery Management Council's Pelagic and Mariana Archipelago Fishery Ecosystem Plans (FEPs). The MUS and life stages that may be found in these waters include: eggs, larvae, juveniles and adults of Coral Reef Ecosystem MUS (CRE-MUS) and eggs, larvae, juveniles and adults of Crustacean MUS (CMUS).

The Ajayan River mouth is located within the Achang Reef Flat Marine Preserve. According to Guam Code Annotated Chapter 63 §63116.1, "The purpose of the marine preserve is to protect, preserve, manage, and conserve aquatic life, habitat, and marine communities and ecosystems, and to ensure the health, welfare and integrity of marine resources for current and future generations by managing, regulating, restricting, or prohibiting activities to include, but not limited to, fishing, development, human uses." The preserve was established by law in 1997 and first enforced in 2001, since that time the reef fish populations have increased.

Unlike previous bridge projects at Acfayan and Ylig, the coral zone starts less than 200 meters (m) from the project site, with highly diverse coral areas found within 400 m of the project site. Stormwater runoff and sedimentation from this bridge project are more likely to reach important habitat areas. The sea grass beds and reef flat areas provide important juvenile habitat for popular food fish species such as *Lethrinus harak, Leptoscarus vaigiensis, Siganus spinus, and S. argenteus*. The reef margin has a diverse coral assemblage.

**EFH Conservation Recommendations**

NMFS PIRO finds that this action **Would Adversely Affect EFH** through temporary water quality impairments, including an increase in turbidity and sedimentation, during the project. NMFS PIRO recommends pursuant to Section 305(b)(4)(A) of the Magnuson-Stevens Act that FHWA, DPW, and their contractors include the following Conservation Recommendations in the Ajayan Bridge Project to avoid and minimize these impacts to coral reef resources and EFH:

1. Ensure strict adherence to the BMPs listed in your consultation letter. Recent projects at Acfayan and Ylig did not fully comply with BMPs. Sensitive EFH is much closer to this project site and will be impacted by any runoff and sedimentation from this project. Regular site inspections for compliance with BMPs is advised.

2. Due to the close proximity of the reef and important EFH, we strongly urge FHWA to use an adaptive management strategy for managing construction and operation impacts related

to sediments and water quality. To assist this, we recommend that FHWA employ real time turbidity monitoring at various depths, in addition to visual assessments of turbidity, to ensure timely interaction to prevent sediment impacts to sensitive habitats. Sensors should be placed near the bottom, at mid depth, and 1m below surface both upstream (reference site) and downstream of the project area. Per Guam Water Quality Standards the turbidity should not increase over 1 NTU over the reference site. Frequent monitoring allows the construction team to change speed, methods, check curtains, etc. in time to avoid impacts to nearby reefs and potential shutdowns for water quality exceedances.

3. Replace vegetation as soon as possible along both stream banks and shorelines. We encourage the use of hydroseeding, fiber mats, or other suitable material as interim cover for exposed soil, even if the soil will be exposed for a relatively short time period.

4. The Ajayan River has some known aquatic invasive species. Please ensure that all equipment used in the water is cleaned prior to moving it to another project site to avoid the spread of invasive species.

5. Should the BMPs not be properly implemented or fail to protect EFH, FHWA should develop a compensatory mitigation plan to offset loss of EFH associated with this project.

Please be advised that regulations (Section 305(b)(4)(B) of the MSA) to implement the EFH provisions of the MSA require that Federal action agencies provide a written response to this letter within 30 days of its receipt and at least 10 days prior to final approval of the action. A preliminary response is acceptable if final action cannot be completed within 30 days. The final response must include a description of measures to be required to avoid, mitigate, or offset the adverse impacts of the activity. If the response is inconsistent with our EFH Conservation Recommendations, an explanation of the reason for not implementing the recommendations must be provided.

This federally funded project is also subject to consultation requirements under the FWCA. Based on our site visit and review of the project plans provided, NMFS does not consider that further FWCA related investigation to determine impact to marine fish and wildlife resources is necessary for this project. This does not remove your responsibilities to consult with the US Fish and Wildlife Service and Guam Department of Agriculture on this project.

**Conclusion**

In conclusion, NMFS greatly appreciates the FHWA's efforts to effectively coordinate with us early on the proposed Ajayan Bridge project, and the efforts taken to minimize adverse effect to EFH, particularly coral reef and seagrass resources in the project area. We determine that adverse affect to EFH will occur without minimization measures as described in the Conservation

Recommendations listed above. However, with careful project implementation and the project should have minimal long term impacts on EFH in the area.

We greatly appreciate the opportunity to review and comment on this project. Should you have any questions, comments, or require additional technical assistance, please contact Valerie Brown in our Guam Field Office valerie.brown@noaa.gov or 671-646-1904.

Sincerely,

Gerry Davis
Assistant Regional Administrator
Habitat Conservation Division

cc by e-mail:
Ryan Winn, US ACOE, Honolulu District
Christine Camacho Fejeran, GCMP, BSP
Celestino Aguon, DAWR, DoAg
Ray Calvo, Guam EPA

U.S. Department of Transportation
**Federal Highway Administration**

**Hawaii Federal-Aid Division**

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September 1, 2015

In Reply Refer To:
HDA-HI

Gerry Davis
Assistant Regional Administrator – Habitat Conservation
National Marine Fisheries Service
Pacific Island Regional Office
NOAA Inouye Regional Center
1845 Wasp Blvd., Building 176
Honolulu, HI 9818

Subject: Route 4 Ajayan Bridge Replacement, Project No. GQ-ER-0004(114)
Essential Fish Habitat Consultation – Conservation Recommendations

Dear Mr. Davis:

Thank you for your letter dated May 13, 2015 regarding the subject project. We agree to include with some clarifications, the Conservation Recommendations, included in your letter, into the Ajayan Bridge Project to avoid and minimize impacts to coral reef resources and EFH. The Conservation Recommendations we plan to implement are as follows:

1. Ensure strict adherence to the BMPs listed in our consultation letter dated July 29, 2014. Regular site inspections for compliance with BMPs will be conducted by the Guam Department of Public Works (DPW) and/or their consultants;

2. Utilize adaptive management strategy for managing construction and operation impacts related to sediments and water quality. Specifically, we will be employing real time turbidity monitoring in addition to visual assessments of turbidity to ensure timely interaction to prevent sediment impacts to sensitive habitats. Per Guam Water Quality Standards the turbidity should not increase over 1 NTU over the reference site. We plan on having one sensor upstream, one sensor in the containment area, and two sensors downstream. The water is shallow in this area, so we will attempt to place it at least 1 meter below the surface. As this will be the first time that real time turbidity monitoring will be utilized on a DPW project, we will invite National Marine Fisheries Services staff to visit the site during the initial implementation of the monitoring. We will also invite NMFS staff to join DPW for a site visit that will occur every other week for the first three months of monitoring and thereafter monthly for the remainder of the necessary monitoring time. Should there be issues during the real time turbidity monitoring we will notify your office of our revised plan for monitoring turbidity;

3. Replace vegetation as soon as possible along both stream banks and shorelines. Areas which are disturbed and anticipated to be without vegetation for longer than three weeks will be

covered with hydroseeding, fiber mats, or other suitable material as interim cover for the exposed soil.

4. Equipment in the water will be cleaned prior to moving it to another project site to avoid the spread of invasive species.

5. If the BMPs are not properly implemented or fail to protect EFH, the Guam DPW will develop a compensatory mitigation plan to offset loss of EFH associated with the project.

With our commitment to the above Conservation Recommendations, we consider consultation under EFH to be completed. If you have any questions or comments, please feel free to contact me at (808)542-2311 or via email at richelle.takara@dot.gov.

Sincerely yours,

Richelle M. Takara, P.E.
Transportation Engineer

cc: Joaquin Blaz, Guam DPW
Michael Lanning, PTG
Jeff Wilson, PB
Sagrado Bilong, DPW

## G.9 United States Fish and Wildlife Service

AECOM
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808 523 8874 tel
808 523 8950 fax

May 31, 2012

Mr. Loyal Mehrhoff
U.S. Fish and Wildlife Service
Pacific Islands Fish and Wildlife Office
300 Ala Moana Blvd., Room 3-122
Box 50088
Honolulu, HI 96850

Subject: Guam Department of Public Works, Proposed Ajayan Bridge Replacement Project Project No. GQ-ER-0004(114)/GU-NH-0004(114)
Request for Species List

Director Mr. Loyal Mehrhoff:

The U.S. Department of Transportation - Federal Highways Administration (FHWA), in coordination with the Guam Department of Public Works (DPW) proposes to replace the existing Ajayan River Bridge located on Route 4, on the boundary between Merizo and Inarajan. AECOM is consulting your agency on the behalf of the DPW and FHWA. A Categorical Exclusion document for compliance with the National Environmental Policy Act (NEPA) will be prepared for the project.

**Ajayan Bridge Existing Condition**
The Ajayan River Bridge is located on Route 4 on the boundary between Merizo and Inarajan, as shown in Figure 1-1.

The existing single span cast-in-place concrete box girder bridge was constructed in 1968 with a span of approximately 76.2 feet and a skew of 40 degrees. Abutments are founded on concrete piles and the deck has an asphalt concrete wearing surface. The most recent bridge inspection report, dated May 27, 2004, noted that the substructure and channel are rated in serious condition with cracking and differential movement noted for substructure units and significant scour at abutments, as shown in the enclosed Photo Log. The channel alignment and waterway opening are also noted as deficient.

**Proposed Action**
The proposed action would replace the existing two-lane bridge across the Ajayan River just upstream of the river mouth as it enters the ocean. Bridge abutment slopes would be protected from erosion by placement of stone rip rap. There would be minimal roadway approach work. Proposed improvements include two 12-foot lanes with 8-foot paved shoulders. Roadway alignment and grade would match existing at points of tie-in. Roadway work within project limits would include removal of the existing pavement and design of full-depth pavement replacement and replacement of guardrail. The proposed action would include geotechnical sampling, testing, and analysis. As shown in Figure 1-2, soil borings for bridge foundations would be taken at two locations, one at each proposed substructure unit, to a depth of at least 100 feet or at least 10 feet into competent bedrock, whichever is shallower. Additionally, two shallow borings to a depth of 15 feet would be taken within the roadway approach area. All work would be conducted within existing right-of-way.

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To assist FHWA and DPW with report documentation, compliance with the Endangered Species Act, NEPA, and other relevant laws and regulations, we respectfully request a listing of threatened and endangered species, Federal candidate species, and/or plants and animals of special concern that are known to occur or have the potential to occur within the proposed project area.

We appreciate your efforts in assisting us with the development of this project. If you require additional information, please feel free to contact me at 808.356.5394 (office direct), 808.223.9213 (cell), or via email at Jennifer.Scheffel@aecom.com.

Thank you for your attention to this project notification and any comments you may have.

Sincerely,

Jennifer M. Scheffel
Environmental Planner

Enclosures: Figure 1-1: Site Location Map
Figure 1-2: Geotechnical Soil Boring Locations
Photo Log

cc: Joanne M. S. Brown, DPW (via email)
Ramon Padua, DPW (via email)
Joaquin Blaz, DPW (via email)
Paul Wolf, Parsons Brinckerhoff (via email)
Nora Camacho, Parsons Brinckerhoff (via email)
James Mischler, Parsons Brinckerhoff (via email)
Jennifer Scheffel, AECOM (via email)
Edgar Hipolito, AECOM (via email)
Nemencio Macario, N.C. Macario & Associates, Inc. (via email)
Richelle Takara, FHWA (via email)

## Scheffel, Jennifer

**From:** Paula_Levin@fws.gov
**Sent:** Tuesday, June 12, 2012 2:58 PM
**To:** Rachel_Rounds@fws.gov
**Cc:** Scheffel, Jennifer
**Subject:** Re: Species List for Ajayan Bridge, Guam (2012-SL-0282)
**Attachments:** FWS BMPs.docx

**Follow Up Flag:** Follow up
**Flag Status:** Flagged

Thank you for forwarding Rachel: I do not have a document to review and respond to but under normal circumstances I would recommend standard best management practices to prevent impacts to aquatic habitat from construction (attached). It is likely that the project will undergo review by the U.S. Army Corps of Engineers for a permit for work in navigable waters of the U.S., at which time the Corps would notify us and request review. However, considering this early planning stage, I can only guess that the Corps may determine that this project qualifies for a nationwide permit. If so, these standard BMP's, among other conditions, would be part of the conditions of the permit, and enforceable. Otherwise, even if the project was substantial enough to warrant individual permit review, we would probably offer the same recommendations, based on the presumption that the project involves only a replacement or repair of an existing structure, without additional development or impacts to aquatic habitat. Upon further review, the Service (Section 7 staff) might also add some conditions to avoid impacts to nesting sea turtles or seabirds. Thank you for coordinating.

Paula Levin
USFWS Pacific Islands
Coastal Conservation
(808)792-9417

**Rachel Rounds/R1/FWS/DOI**

06/12/2012 01:46 PM

To Jennifer.Scheffel@aecom.com
cc Paula Levin/R1/FWS/DOI@FWS
Subject Species List for Ajayan Bridge, Guam (2012-SL-0282)

Hi Jennifer,

I received your species list request for the proposed Ajayan Bridge Replacement on Guam. I have reviewed the documentation provided in your May 31, 2012, letter. I have no further comments below what I wrote in the email forwarded below. I recommend that Mariana moorhen surveys be conducted and that it be determined if sea turtle nesting beaches are located nearby. I have also cc'd Paula Levin on this email. She works for our USFWS office on impacts to other resources (such as aquatic habitat) not covered by the Endangered Species Act. She may have additional comments or concerns.

Thanks,

Rachel

Rachel Rounds
Fish and Wildlife Biologist
Consultation and HCP Program
US Fish and Wildlife Service
Pacific Islands Field Office
300 Ala Moana Boulevard, Room 3-122

Honolulu, HI 96850
(808) 792-9454

----- Forwarded by Rachel Rounds/R1/FWS/DOI on 06/12/2012 01:33 PM -----

**Rachel Rounds/R1/FWS/DOI**

05/03/2012 02:53 PM

To "Harnsberger, David" <David.Harnsberger@aecom.com>
cc "Scheffel, Jennifer" <Jennifer.Scheffel@aecom.com>, Jodi Charrier/R1/FWS/DOI@FWS
Subject RE: Fw: Recovery Habitat GIS DataLink

Hi David,

I have reviewed the attachments you sent with your email to Fred. I assume that this project is funded by the FHWA? You are correct that there is Guam rail recovery habitat near the Ajayan River. However, because the Guam rail is extinct in the wild, we do not consult on loss of Guam rail recovery habitat on this scale (I am assuming that the amount of habitat that might be cleared would be relatively small). We would however recommend that the amount of habitat cleared be minimized to the maximum extent possible.

The two species that would need to be considered in a consultation for a bridge replacement project on Guam are the Mariana moorhen and green sea turtle. In-water effects to the turtle would be addressed by NOAA, but any affects to nesting beaches would be addressed by FWS. Mariana moorhen could be using the river and wetlands along the Ajayan River so surveys may be necessary.

Please let me know if you have any further questions.

Rachel

Rachel Rounds
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Consultation and HCP Program
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**Fred Amidon/PIE/R1/FWS/DOI**

05/03/2012 11:07 AM

To "Harnsberger, David" <David.Harnsberger@aecom.com>
cc "Scheffel, Jennifer" <Jennifer.Scheffel@aecom.com>, Jodi Charrier/R1/FWS/DOI@FWS, Rachel Rounds/R1/FWS/DOI@FWS
Subject RE: Fw: Recovery Habitat GIS DataLink

Hi David,

This is a question for our Section 7 program. I've ccd both Jodi Charrier and Rachel Rounds on this email as they both work on projects in Guam for this office. They should be able to answer your question regarding other species that may occur at the project site.

Thanks,

Fred

**"Harnsberger, David" <David.Harnsberger@aecom.com>**

05/02/2012 10:56 AM

To "Fred_Amidon@fws.gov" <Fred_Amidon@fws.gov>
cc "Scheffel, Jennifer" <Jennifer.Scheffel@aecom.com>
Subject RE: Fw: Recovery Habitat GIS Data

Hello Fred,
Thanks for your prompt and clear response to Susan's e-mail below. I have referenced your e-mail in the EA we are working on for that project, so you're now well on your way to true fame ;-D
I'm now underway with a set of figures for a Bridge Replacement Project at the mouth of the Ajayan River at the Southern tip of Guam. When I drop the Critical Habitat and Recovery Habitat shapefiles I have for the project we discussed below into the attached Site Location Map, the only "Rare, Threatened & Endangered Species" data that shows up is the Guam Rail Recovery Habitat Area shown in the 2nd attached file. Could you help me confirm that Guam Rail is the only rare, threatened & Endangered plant/animal we will need to be careful of/think about for this bridge replacement project at the mouth of the Ajayan River?
Thanks!
Dave

**From:** Fred_Amidon@fws.gov [mailto:Fred_Amidon@fws.gov]
**Sent:** Wednesday, December 14, 2011 3:08 PM
**To:** Harnsberger, David
**Cc:** Susan_Machida@fws.gov
**Subject:** Re: Fw: Recovery Habitat GIS Data

David,

Based on the maps you sent it looks like you are using the latest recovery habitat maps. If you have any additional questions regarding the files let me know.

Fred Amidon
Fish and Wildlife Biologist
Pacific Islands Fish and Wildlife Office

**Susan Machida/PIE/R1/FWS/DOI**

12/09/2011 07:34 AM

To Fred Amidon/PIE/R1/FWS/DOI@FWS
cc
Subject Fw: Recovery Habitat GIS Data

Hi Fred,

I got a call from a consultant yesterday. He has some GIS files, received previously from Holly Herod, which he wants to use in another EA he's working on. He wants FWS to verify that these areas are still the current recovery habitat areas for the various species (listed below). Can you verify? I think it would be better that he reference a biologist, rather that GIS,

since he's verifying content.

Thanks. Let me know if you have any questions.

---
Susan Machida
U.S. Fish & Wildlife Service
300 Ala Moana Boulevard, Room 3-122
Honolulu, HI 96813
Tel: 808.792.9400

----- Forwarded by Susan Machida/PIE/R1/FWS/DOI on 12/09/2011 07:31 AM -----

**"Harnsberger, David" <David.Harnsberger@aecom.com>**

12/08/2011 02:56 PM

To "susan_machida@fws.gov" <susan_machida@fws.gov>
cc "Koehler, Tobias" <Tobias.Koehler@aecom.com>
Subject Recovery Habitat GIS Data

Good afternoon Ms. Machida,
Thanks for taking the time to speak with me this afternoon. Please find attached the figures I have drafted for the current Env. Assessment (EA) we have underway at the northern end of Andersen Air Force Base. The Recovery Habitat areas shown in these figures are wrought from data that the sub AECOM hired to do the Build-up figures received from the FWS:

USFWS. 2010. GIS data for Mariana Crow, Guam Rail, Guam Micronesian Kingfisher, and Serianthes Recovery Habitat. Personal communication from H. Herod, Section 7 Biologist, Pacific Islands Office, Honolulu, HI to C. Cobb, Sr. Natural Resources Specialist, NAVFAC Pacific, Honolulu, HI. January.

I used the data received for the Build-up EIS to draft the attached figures. If you could verify the areas shown are current, I think I could phrase the reference for our EA like this:

USFWS. 2010. GIS data for Recovery Habitat of the Mariana Crow, Micronesian Kingfisher, Guam Rail, and Firetree. Personal communication from S. Machida, <<your title>>, Pacific Islands Office, Honolulu, HI to David F. Harnsberger, Geologist, AECOM, Honolulu, HI. ## December.

Does this seem right to you?
Thanks!
Dave

---
David F. Harnsberger
Scientist Level I
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[attachment "Figure 3-3.  Recovery Habitat_crow_forSM.jpg" deleted by Fred Amidon/PIE/R1/FWS/DOI] [attachment "Figure 3-4. RecoveryHab_Rail&Firetree_forSM.jpg" deleted by Fred Amidon/PIE/R1/FWS/DOI] [attachment "K. Rare, Threatened & Endangered Species_compressed.pdf" deleted by Rachel Rounds/R1/FWS/DOI] [attachment "Figure 1 - Site Location Map.pdf" deleted by Rachel Rounds/R1/FWS/DOI]

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November 13, 2012

Ms. Rachel Rounds
Fish and Wildlife Biologist
U.S. Fish and Wildlife Service
Pacific Islands Field Office
300 Ala Moana Blvd., Room 3-122
Box 50088
Honolulu, HI 96850

Subject: Ajayan Bridge Replacement Project Proposed Construction Description
FHWA Project No. GQ-ER-0004(114)/GU-NH-0004(114)
USFWS Project No. 2012-SL-0282

Dear Ms. Rounds,

This letter is to follow-up with you on the proposed subject line project. Our intent is to clarify the project location and give a more thorough description of the demolition and construction work being proposed in the Ajayan Bridge Replacement Project.

**Background**

In June 2012, AECOM sent a letter to USFWS, National Marine Fisheries Service (NMFS), and Guam Department of Agriculture (DAWR), describing the proposed bridge replacement project and requesting a list of threatened and endangered species that are known to occur or have the potential to occur within the proposed project area (Attachment 1). We received an email response from your office (see Attachment 2) that made a recommendation to conduct a survey for Mariana moorhen and green sea turtle nesting beaches. In addition to the project location and description, we have included an overview of the Best Management Practices (BMPs) that will be implemented during demolition and construction.

**Project Specifics**

The existing bridge will be demolished by cutting it into sections that will be removed by a crane. The existing bridge abutments will be demolished and the existing piles will be cut down to the river bed. The embankment soil between the old abutment and the new abutment will be removed (Figure 2, Bridge Profile). The bridge will be partially demolished to allow two-way, one land traffic while the first half of the new bridge is being constructed. After phase 1 is complete, it will be shifted to the other side to construct the other half of the bridge. Best

Management Practice (BMP) will include catchment platforms and protective netting, silt screen fences, and a turbidity curtain.

All work will be completed within the existing right-of-way (ROW). The proposed new 40-foot wide by 105-foot long bridge will replace the existing box beam type bridge. A new bridge foundation will be constructed inland, or behind the existing abutment to minimize disturbance to the river channel. Twenty-four new piles will be driven to support the new abutment. The soil between to old abutment and new abutment will be excavated and grouted riprap will be placed on a gradual slope from the new abutment to the remaining old pilings. Each side of the bridge will have a concrete barrier poured integrally with the bridge deck. A standard road barrier and railing on either side of the bridge will tie in to the concrete barrier. All other utilities will be considered as part of the load to be carried by the bridge and supported by the bridge hangers. All construction will take place within the existing right-of-way and, with the exception of the temporary turbidity curtain, no construction will take place in the river channel.

**Recommendation**

We appreciate the comments sent via email in May. If the Mariana moorhen and green sea turtle are still the outstanding concerns for that location, we will continue consultation as such. If the above information changes your recommendation, we appreciate hearing from you. Please contact Julia Staley at julia.staley@aecom.com or at 808-269-2949.

Sincerely,

Julia Staley
Environmental Planner

Enclosures: Consultation letter AECOM to USFWS
Consultation response USFWS to AECOM
Project Location Map
Bridge Profile Plan

c: Nora Camacho, PB (via email)
James Mischler, PB (via email)

U.S. Department of Transportation
Federal Highway Administration

**Hawaii Federal-Aid Division**

300 Ala Moana Blvd, Rm 3-306
Box 50206
Honolulu, Hawaii 96850
Phone: (808) 541-2700
Fax: (808) 541-2704

July 31, 2014

In Reply Refer To:
HDA-HI

**Mr. Loyal Mehrhoff**
**U.S. Fish and Wildlife Service**
**Pacific Islands Field Office**
**300 Ala Moana Blvd., Room 3-122**
**Box 50088**
**Honolulu, HI 96850**

**Subject: Route 4 Ajayan Bridge Replacement**
**FHWA Project No. GQ-ER-0004(114)**
**Section 7 Endangered Species Act**

Dear Mr. Mehrhoff:

The U.S. Department of Transportation Federal Highways Administration (FHWA), in close coordination with the Guam Department of Public Works (DPW) requests initiation of informal consultation under Section 7(a)(2) of the Endangered Species Act (ESA) and concurrence with a determination of effect for the proposed replacement of the existing Ajayan River Bridge located on Route 4, on the boundary between Merizo and Inarajan(Project No. GQ-ER-0004(114)).

**Ajayan Bridge Existing Condition**

The Ajayan Bridge is located on Route 4 on the boundary between Merizo and Inarajan. The bridge provides two lanes that cross the Ajayan River just upstream of the river mouth as it enters the ocean (Enclosure 1 – Project Location Map).

The existing single-span cast-in-place concrete box girder bridge was constructed in 1968, with a span length of approximately 76.2 feet and a skew of 40 degrees. Abutments are founded on concrete piles; the deck has an asphalt concrete wearing surface. The most recent bridge inspection report, dated May 27, 2004, noted that the substructure and channel are rated in serious condition. The damage noted includes cracking and differential movement of substructure units and significant scour at abutments (Enclosure 2 – Photo Log).

**Project Description**

The existing bridge will be demolished and replaced with a new 40 foot wide by 105 foot long bridge. The proposed improvements include two 12 foot wide lanes and two 8 foot wide paved shoulders. Roadway alignment and grade will match the existing at the point of tie-in.

To accommodate traffic while the new bridge is being constructed, the bridge will be demolished in two phases, demolishing one side (longitudinally) of the bridge at a time. This will allow two-way traffic (one lane, controlled by traffic lights) to use the bridge during demolition and construction.

The project will entail the demolition and removal of the existing bridge structure and existing pile caps. The existing piles below the waterline will be cut and capped at the mudline, but left in-place. This will provide for minimal disturbance of the aquatic ecosystem. Roadway work within the project limits will include removal of the existing pavement, full-depth pavement replacement, and replacement of the guardrails. The proposed action will also include geotechnical sampling, testing, and analysis. As shown in Enclosure 3 – Proposed Geotechnical Soil Boring Locations, soil borings for bridge foundations will be taken at two locations, one at each proposed substructure unit, to a depth of at least 100 feet or at least 10 feet into competent bedrock, whichever is shallower. Additionally, two shallow borings to a depth of 15 feet will be taken within the roadway approach area.

**Demolition and Construction Methods**

Demolition

Bridge demolition will include removal of the existing bridge deck, box beam, abutments, wing walls, guardrails, and parapet. The existing bridge is approximately 29.6 feet wide and will be demolished in two phases to allow for one lane to remain open for traffic. Phase 1 will include saw-cutting the westbound portion of the existing bridge and removing it by crane. Phase 2 will include the same actions to the eastbound portion of the existing bridge. Before demolition and removal, a temporary concrete barrier will be installed on the existing bridge, and existing utilities will be temporarily relocated to the opposite portion of the bridge during each phase.

Demolition of the existing abutment walls will be accomplished by use of jackhammers and/or hoe rams, and removed via mechanical equipment such as a backhoe. The existing bridge abutments will be demolished and the existing piles will be cut down to the river bed. The soil between the old abutment and new abutment will be excavated, and 48-inch-thick grouted riprap will be placed on a gradual slope from the new abutment to the remaining old pilings, as shown in Enclosure 4 – Bridge Profile. A combined total of approximately 540 cubic yards of soil and concrete abutment wall material will be excavated from below the mean high water (MHW) line of the Ajayan River. The combined total linear disturbance to the stream channel from the excavation of the soil and concrete abutment wall material will be approximately 407 linear feet.

Construction

Construction of the new bridge will also be performed in two phases so that two-way signal-controlled traffic can be maintained in one lane during construction. Phase 1 will include demolition of the existing westbound portion of the bridge and construction of the new westbound portion of the bridge. During Phase 1, utilities and two-way signal-controlled traffic will be temporarily relocated to the eastbound portion of the existing bridge. Phase 2 will include demolition of the existing eastbound portion of the bridge and construction of the new eastbound portion of the bridge. During Phase 2, utilities will be permanently installed in the westbound portion of the new bridge, and two-way signal-controlled traffic will be temporarily relocated to the westbound portion of the new bridge. Work areas for Phase 1 and Phase 2 are shown in Enclosure 5 – Traffic Control Plans.

A new bridge foundation will be constructed inland, or behind, the existing abutment to minimize disturbance to the river channel. The proposed abutments will be set back from the existing abutments. The soil and grouted riprap between the remaining existing piles and the new abutment will be sloped back at a 3H:1V ratio. The two new abutments will be constructed at the top of the slope and supported by twelve piles (per abutment), for a combined total of twenty-four new octagonal 16.5-inch-diameter concrete piles (100 tons per pile). The new abutments and abutment piles will be constructed above the MHW line.

Approximately 947 cubic yards of grouted stone riprap will be placed along the abutment walls, below the MHW line, to protect the abutment from erosion caused by waves. The riprap (fill material) will be placed along approximately 401 linear feet of stream channel. The riprap will be placed within the excavation footprint and will not impact additional areas of the stream channel.

Best Management Practices

Best management practices (BMPs) will include catchment platforms and protective netting, silt screen fences, and turbidity curtains. Catchment platforms and protective netting will be installed under the bridge to keep debris from falling into the water. Silt screen fences will be placed at the slope toe around the river edges to prevent erosion and rubbish from going into the water. Turbidity curtains will be installed at both river banks surrounding the work areas to prevent the spread of silt and sediment into the river and bay (Enclosure 6 – BMP Drawings).

**Natural Environments**

The proposed project is located within the southern end of Guam, which is characterized by hilly volcanic slopes descending from approximately 800 feet in elevation to sea level over distances of less than 2.5 miles. The project site is situated between the Inarajan and Manell watersheds. The Ajayan Bridge is situated on the southern end of the Ajayan River, adjacent to the Ajayan Bay discharge point. Flora and fauna surveys of the proposed project area were conducted by SWCA Environmental Consultants (SWCA) on November 6 and 7, 2013. During these surveys, emphasis was placed on identifying special-status species. The following paragraphs describe the existing terrestrial and aquatic environments that occur within the proposed project area as reported by SWCA and Guam Department of Agriculture, Division of Aquatic and Wildlife Resources (DAWR).

Terrestrial Ecology

Forest surrounding the project area consists mostly of secondary thicket/scrub forest with some ravine forest. Areas of forested palustrine wetlands are located along the east and west banks of the Ajayan River. Several typhoons that occurred between the 1970s and 1990s changed the vegetation in the area dramatically. Site visits conducted by Guam DAWR staff in February and March 2013 found that pago (*Hibiscus tiliaceus*) and tangantangan (*Leucaena leucocephala*) were the two common species in the project area.

During flora surveys performed by SWCA on November 6 and 7, 2013, a total of 19 plants were identified to either genera or species. The seven native plants documented consisted of five trees (pago, *Pandanus tectorius*, *Bougainvillea glabra*, *Callicarpa candicans*, and *Morinda citrifolia*), one fern (*Polypodium scolopendria*), and one grass (*Saccharum spontaneum*). The non-native plants documented were pugua (*Areca catechu*), coconut trees (*Cocos nucifera*), beggar's tick (*Bidens alba*), Siam weed (*Chromolaena odorata*), mile-a-minute vine (*Mikania scanden*), daok (*Calophyllum inophyllum*), papaya (*Carica papaya*), tangantangan, kamachile (*Pithecellobium dulce*), and *Musa* sp.

Shoreline Ecology

The project area is located at the mouth of the Ajayan River as it discharges into Achang Reef Flat. The shoreline vegetation is composed primarily of coconut trees, pago, and tangantangan.

Although not located within the boundaries of the project area, a small Nypa palm (*Nypa fruticans*) (also referred to as "Nipa") community was identified approximately 10 meters upstream of the Ajayan River. This species is a wetland obligate and grows in brackish marshes.

Aquatic Ecology

The Ajayan River flows south and discharges at the Ajayan Bay. The Ajayan Bay includes the eastern portion of the Achang Reef Flat Marine Preserve (Enclosure 7 – Achang Reef Flat Marine Preserve). The Ajayan River channel cuts completely through the reef flat at Ajayan Bay. The reef flat consists of inner and outer reef flats that are exposed at low tide. Mangroves and sea grass beds are present in the vicinity of the project site.

According to the University of Guam Marine Laboratory's Guam Coastal Atlas (www.guammarinelab.com/coastal.atlas/htm/Maps.htm), the benthic habitat of the river channel is composed of "sand, uncolonized 90% to 100%", extending from inland waters to 500 meters offshore. The benthic habitat to the east of the channel is composed of "spur and groove, coral 10% to <50%" near the shore, and "pavement, turf 50% to <90%" after approximately 100 meters offshore. The benthic habitat to the west of the channel is composed of "spur and groove, coral 50% to <90%" near the shore, and "pavement, coral 10% to <50%" after approximately 50 meters offshore.

The Achang Reef Flat supports primarily hard corals. Only two soft coral species have been identified by the University of Guam Marine Lab during monitoring of the site.

Achang Reef Flat is classified as M-1, Excellent. Waters in this category are suitable for whole-body contact and recreation. These waters are also needed for research and to ensure the preservation and protection of marine life, including coral, reef-dwelling organisms, fish, and related resources, and aesthetic enjoyment. The surface waters of the Ajayan River are classified as S-3, Low. Waters in this category are used primarily for commercial, agriculture, or industrial activity. Aesthetic enjoyment and recreational body contact are limited. Maintenance of aquatic life is also limited.

**Agency Coordination**

In May 2012, AECOM sent a letter to USFWS describing the proposed bridge replacement project and requesting a list of threatened and endangered species that are known to occur or have the potential to occur within the proposed project area. AECOM received an email response from your office that recommended (1) surveys for Mariana moorhen be conducted, (2) a determination of sea turtle nesting beaches in the region of influence be made, and (3) best management practices to be implemented (Enclosure 8 – June 2012 Response from USFWS). In November 2012, AECOM sent a second letter to USFWS to clarify the project location and provide a more detailed description of proposed demolition and construction activities for the Ajayan Bridge Replacement Project.

Letters describing proposed project activities and requesting lists of special-status species were also sent to National Marine Fisheries Service (NMFS) and DAWR. FHWA is also sending requests to NMFS for concurrence on ESA and special-status species effect determinations. An Essential Fish Habitat consultation request will also be submitted to NMFS. A description of proposed project activities has been provided to the U.S. Army Corps of Engineers (ACOE). A formal request for a Clean Water Act Section 404 Permit and a Rivers and Harbors Act Section 10 Permit will submitted to the ACOE.

In addition to the federally listed species identified by USFWS as potentially occurring within the proposed project area, DAWR recommended that a survey be conducted and impacts assessed for the locally endangered and federally threatened Mariana fruit bat and the locally endangered and federal candidate species for listing Pacific tree snail.

As requested by the various agencies, flora and fauna surveys were completed for this project. SWCA performed the flora and fauna survey and their report is included as Enclosure 9 – Flora and Fauna Surveys for the Ajayan Bridge Replacement Project.

**Federally Threatened and Endangered Species**

Based on background research and the information provided by NMFS, USFWS, and the DAWR, the only federally threatened and endangered species, under USFWS jurisdiction, that may occur within the proposed project area are the federally endangered Mariana common moorhen (*Gallinula choropus guami*), the federally threatened Mariana fruit bay (*Pteropus m. mariannus*), the federal candidate species for listing Pacific tree snail (*Partula radiolata*) and nesting beaches of the federally threatened green sea turtle (*Chelonia mydas*) and the federally endangered hawksbill sea turtle (*Eretmochelys imbricate*).

Mariana Common Moorhen – Federally Endangered

The federally endangered Mariana common moorhen is a slate-black bird about 14-inches in length. Distinguishing physical characteristics include a red bill and frontal shield, white under tail coverts, a white line along the flank, and long olive green legs.

The Mariana common moorhen are found in natural and man-made wetland areas of Guam, Saipan, Tinian, and Pagan of the Mariana Islands. Only these islands in the Mariana Archipelago have permanent freshwater wetlands capable of supporting the moorhen. The Mariana moorhen inhabits emergent vegetation of freshwater marshes, ponds and placid rivers. The key characteristics of moorhen habitat are the combination of robust emergent vegetation cover and open water areas.

The Mariana common moorhen nests throughout the year and typically lays eggs concealed in emergent vegetation near open water. Moorhens feed on both plant and animal matter in or near water. Grasses, adult insects, and insect larvae have been reported in moorhen stomachs[1].

Mariana Fruit Bat – Federally Threatened

The locally endangered and federally threatened Mariana fruit bat is a medium-sized bat weighing 0.66 to 1.15 pounds, with a forearm length ranging from 5.3 to 6.1 inches. The abdomen is colored black to brown, with interspersed gray hair. The shoulders and sides of the neck are usually bright golden brown, but may be paler in some individuals. The head is brown with rounded ears and large eyes.

The Mariana fruit bat is a subspecies endemic to the Mariana archipelago. It is a highly colonial species forming large dense roosts in multiple adjacent trees. There is small percentage of non-colonial solitary roosting individuals. Mating and nursing young have been observed year-round on Guam with no consistent annual peak in births.

The bats' diet is comprised of fruits, nectar, pollen and some leaves. Due to the rapid digestion and metabolism of such foods, the bats are reliant on forest habitat with diverse food sources that are available throughout the year. The Mariana fruit bat forage and roost primarily in native forest. Occasionally foraging in agricultural forests composed primarily of nonnative plants. The bats inhabit several native forest types, including primary and secondary limestone forest, volcanic forest, old coconut plantations, and groves of gaga or ironwood (*Casuarina equisetifolia*). Grass lands with isolated trees are also used by the bats. Foraging sometimes occurs at farms and residential areas with flowering or fruiting trees. On Guam, large *Ficus* spp. had been the favored roosting sites. After the loss of many of these trees to typhoons, roosting shifted to *Aglaia mariannensis* (mapunao), *Macaranga thompsonii*

[1] U.S. Fish and Wildlife Service. 1991. Recovery Plan for the Mariana Common Moorhen (*Gallinula choropus guami*). U.S. Fish and Wildlife Service. Portland, OR.

(pengua), *Mammea odorata* (chopak), and *Neisosperma oppositifolia* (fagot). Presently the Mariana fruit bat persists in small numbers on Guam, primarily in the northern region of the island[2].

Pacific Tree Snail – Federal Candidate Species for Listing

The locally endangered Pacific tree snail is endemic to the island of Guam. Tree snails live in cool, shaded forest habitats with high humidity and low air movement[3]. The Pacific tree snail was once common along stream courses in southern Guam[4].

Green Sea Turtle – Federally Threatened

The federally threatened green sea turtle is the largest of the cheloniidae, with adults that can exceed 3.2 feet in carapace length and 268 pounds in body mass. Characteristics that distinguish the green seas turtle from other species of sea turtle include a smooth carapace with four pairs of lateral scutes, a single pair of prefrontal scales, and a lower jaw-edge that is coarsely serrated, corresponding to strong grooved and ridges on the inner surface of the upper jaw.

The green sea turtle is a circumglobal species found in tropical seas and, to a lesser extent, in subtropical waters with temperatures above 20°C. In the Pacific United States (U.S.) and its territories, the green sea turtle is found along the coasts of Hawaii, American Samoa, Guam, the Commonwealth of the Northern Mariana Islands, and unincorporated U.S. island possessions.

The green sea turtle occupies three habitat types that include open beaches, open sea, and feeding grounds in shallow, protected waters. The open beaches are used for nesting purposes where the adult female green seas turtles will emerge at night to excavate nests and deposit a clutch that may be in excess of approximately 100 eggs. The green sea turtle use the shallow water habitats to forage, feeding on selected macroalgae and sea greases. The green sea turtle spends the remaining time in the open sea were they may rest and/or are in transient to feeding grounds and/or nesting habitat[5].

Hawksbill Sea Turtle – Federally Endangered

The federally endangered hawksbill sea turtle is recognized by their relatively small (carapace length less than 3.1 feet), narrow head with tapering “beak,” thick, overlapping shell scutes, and strongly serrated posterior margin of the carapace. In addition, hawksbills may be distinguished from the green sea turtle by the transverse division of the prefrontal scales into two pairs (these scales are elongate and undivided in the green sea turtle).

Hawksbill sea turtles are circumtropical in distribution, generally occurring from 30°N to 30°S latitude within the Atlantic, Pacific, and Indian Oceans and associated bodies of water. Along the far western and southwestern Pacific, hawksbills nest on the islands and mainland of Southeast Asia, from China and Japan, throughout the Philippines, Malaysia, and Indonesia, to Papua New Guinea, the Solomon Islands, and Australia.

The hawksbill sea turtle typically selects remote pocket beaches with little exposed sand to nest and deposit their eggs. The nest site is often within the cover of woody vegetation, although some will

[2] U.S. Fish and Wildlife Service. 2009. Draft Revised Recovery Plan for the Mariana Fruit Bay or Fanihi (*Pteropus mariannus mariannus*). U.S. Fish and Wildlife Service, Portland, Oregon.

[3] Guam National Wildlife Refuge and U.S. Fish and Wildlife Service. 2009. Guam National Wildlife Refuge Comprehensive Conservation Plan. Guam National Wildlife Refuge, Yigo, Gaum and U.S. Fish and Wildlife Service. Honolulu, Hawaii.

[4] Hopper, D.R. and B.D. Smith. 1992. Status of tree snails (Gastropoda: Partulidae) on Guam, with a resurvey of sites studied by H.E. Crampton in 1920. Pacific Science 46: 77-85.

[5] National Marine Fisheries Service and U.S. Fish and Wildlife Service. 1998. Recovery Plan for U.S. Pacific Populations of the Green Turtle (*Chelonia mydas*). National Marine Fisheries Service. Silver Spring, MD.

occasionally nest in grass or open sand if preferred cover is not accessible. Hawksbills are typically found feeding on jellyfish, sea urchins, and sponges within the vicinity of rock or reef habitat in shallow tropical waters with little turbidity[6].

Potential Suitable Foraging and Nesting Habitat for Mariana Common Moorhen

No wetlands as designated by the National Wetlands Inventory are located in the project area. However, potentially suitable wetland foraging and nesting habitat for Mariana common moorhen is present within the vicinity of the proposed project. Freshwater wetlands have been identified less than 10 meters upstream from the project site. While uncommon, Mariana common moorhens have been observed near this area. The area has been designated as habitat of low potential for this species.

Potential Suitable Foraging and Roosting Habitat for Mariana Fruit Bat

The Mariana fruit bat is not anticipated to use habitat at or near the proposed project site. Secondary thicket/scrub forest and trees including pago, *Pandanus tectorius*, *Bougainvillea glabra*, *Callicarpa candicans*, and *Morinda citrifolia* are present at the project site. However, this is not the preferred forest type or tree species inhabited by Mariana fruit bat. Forest habitat at the project site may not provide diverse food sources need to support Mariana fruit bats. The Mariana fruit bat is primarily found in the northern region of the island, persisting in small numbers. No Mariana fruit bats were observed during station count surveys of the project area performed on November 6 and 7, 2013, described in Flora and Fauna Surveys for the Ajayan Bridge Replacement Project report (Enclosure 9).

Potential Suitable Habitat for Pacific Tree Snail

Suitable habitat for Pacific tree snail is present within the vicinity of the proposed project. The Pacific tree snail was once common along stream courses in southern Guam. However, no Pacific tree snails were recorded during partulid tree snail surveys of the project area performed on November 6 and 7, 2013, described in the Flora and Fauna Surveys for the Ajayan Bridge Replacement Project report (Enclosure 9).

Potential Suitable Foraging and Nesting Habitat for Green and Hawksbill Sea Turtles

Suitable foraging habitat for green sea turtle and the hawksbill sea turtle is present within the vicinity of the proposed project. The Achang Reef Flat Marine Preserve provides foraging habitat for sea turtles, with food sources such as macroalgae, seagrass beds, and reef-dwelling organisms. Sea turtles have been observed foraging in Ajayan Bay.

Turtle nesting areas are not present at the project site. The *Recovery Plan for U.S. Pacific Populations of Green Turtle* (dated Jan. 12, 1998) reports that there is some low-level nesting of green sea turtle on Guam. The *Recovery Plan for U.S. Pacific Populations of the Hawksbill Turtle* (dated Jan. 12, 1998) reports that hawksbill nesting is rare on Guam. Known turtle nesting beaches on Guam include Ritidian National Wildlife Refuge, Haputo, Urunao, Tumon Bay, Cabras Island, Spanish Steps, Cocos Island, Acho Bay, Nomña Bay, Jinapsan, Tarague Beach, and the waterfront annex of Naval Base Guam[7&8]. The closest known turtle nesting beach to the project site is Acho Bay located approximately one mile (1.6 kilometers) northeast of the project site.

[6] National Marine Fisheries Service and U.S. Fish and Wildlife Service. 1998. Recovery Plan for U.S. Pacific Population of the Hawksbill Turtle (*Eretmochelys imbricate*). National Marine Fisheries Service. Silver Spring, MD.
[7] Department of Agriculture, Division of Aquatic and Wildlife Resources, Guam (DAWR). 2004. Guam Sea Turtle Recovery Annual Progress Report - March 1, 2004 through August 31, 2004. 9 pp.
[8] Grimm, G. and J. Farley. 2008. Sea Turtle Nesting Activity on Navy Lands, Guam, 2007 – 2008. U.S. Navy, NAVFAC Marianas Environmental, Guam. November 2008. 6 pp.

**Mariana Common Moorhen - Determination of Effects**

Suitable wetland foraging and nesting habitat for Mariana common moorhen is present within the vicinity of the proposed project. Therefore, the Mariana common moorhen could be impacted by various components of the proposed project. The following paragraphs describe the potential effects the proposed project may have on Mariana common moorhen.

Loss of Forging, Roosting and Nesting Habitat

Wetlands located less than 10 meters north of the project site provide potentially suitable foraging, roosting and nesting habitat for Mariana common moorhen. The proposed project will not result in the direct loss or direct impacts to wetland habitat. Wetlands will be designated as Environmentally Sensitive Areas where no construction activities, equipment, or personnel are allowed. Wetland habitat north of the project site could be degraded or temporarily impacted by various activities associated with the proposed project. Grading and excavating would be the primary activities that could contribute to the degradation or temporary impacts to wetland habitat. The release of sediment into Ajayan River could occur as the existing abutment walls are demolished and removed, soil behind the existing abutment walls is removed, and new grouted riprap is installed. The sediment release into the Ajayan River could migrate upstream (counter the primary direction of flow) to the wetlands. However, BMPs have been developed to avoid and minimize impacts to Mariana common moorhen habitat as a result of soil erosion and sedimentation of wetlands. A detailed list of the BMPs that would be implemented for the proposed project is provided in the Avoidance and Minimization Measures section of this document. **Based on this information, FHWA has determined that the loss of potential foraging habitat due to the release of sediment would be discountable and would have insignificant effects on the Mariana common moorhen.**

Increased Exposure to Human Activity, Construction Noise and Light

During construction, there would be an increased presence of human activity, construction noise and light. The Mariana common moorhen is known to be wary and to be closely associated with cover provided by edge vegetation. Potential impacts to moorhen from the increased presence of human activity, noise and light would be behavioral disturbance including avoidance of the area and temporary abandonment of nesting, roosting and feeding sites. BMPs have been developed to avoid and/or minimize the potential impacts to Mariana common moorhen from human and construction activity. Some of the BMPs that would be implemented for the proposed project include performing daily surveys, prior to the commencement of work, to insure moorhen are not within the work zone; work stoppage upon observing moorhen within the proposed project area, allowing it to leave on its own; limiting activity beyond the work zone; avoiding night work to the extent practical; minimizing vegetation clearing; performing focused bird surveys prior to vegetation clearing; and avoidance of wetland areas. A detailed list of the BMPs that would be implemented for the proposed project is provided in the Avoidance and Minimization Measures section of this document. **Based on the information, FHWA has determined that the exposure to increased human and construction activity would be discountable and would have insignificant effects on the Mariana common moorhen.**

**Mariana Fruit Bat - Determination of Effects**

The Mariana fruit bat is not anticipated to use habitat at or near the proposed project site. Therefore, impacts to Mariana fruit bat are not anticipated. To insure impacts do not occur, BMPs have been developed as a precautionary measure. BMPs include performing daily surveys, prior to the commencement of work, to insure Mariana fruit bat are not within the work zone; work stoppage upon observing Mariana fruit bat within the proposed project area, allowing it to leave on its own; limiting activity beyond the work zone; avoiding night work to the extent practical; minimizing vegetation clearing; and performing focused bat surveys prior to vegetation clearing. A detailed list of the BMPs that would be implemented for the proposed project is provided in the Avoidance and Minimization

Measures section of this document. **Based on this information, FHWA has determined the proposed project will have no effect on Mariana fruit bat.**

**Pacific Tree Snail – Determination of Effects**

Suitable habitat for Pacific tree snail is present within the vicinity of the proposed project. Vegetation clearing and grading for the proposed project could affect Pacific tree snail and tree snail habitat. However, BMPs have been developed to avoid and minimize impacts to Pacific tree snail and tree snail habitat. BMPs include performing daily surveys, prior to the commencement of work, to insure Pacific tree snail are not within the work zone; work stoppage upon observing Pacific tree snail within the proposed project area, allowing it to leave on its own; limiting activity beyond the work zone; minimizing vegetation clearing; performing focused bat surveys prior to vegetation clearing; and restoration of disturbed areas with native plant as soon as possible. **Based on this information, FHWA has determined the proposed project would have insignificant effects on Pacific tree snail.**

**Green Sea Turtle and Hawksbill Sea Turtle - Determination of Effects**

Foraging habitat for the green sea turtle and hawksbill sea turtle occurs within the vicinity of the proposed project. While known turtle nesting areas are not present at the project site and turtle nesting is not anticipated, there is potentially suitable nesting habitat in the vicinity of the project area. Therefore, the green sea turtle and hawksbill sea turtle could be impacted by various components of the proposed project. The following paragraphs describe the potential effects the proposed project may have on green sea turtle and the hawksbill sea turtle.

Direct Physical Impact

The proposed project includes the use of heavy equipment such as cranes, saws, backhoes and jackhammers to demolish the existing bridge and construct the replacement bridge. These activities have the potential to directly strike green and hawksbill sea turtles should the animals be present during the placement of riprap or if debris were to accidentally fall into the water. Potential injuries and their severity would depend on the animal's proximity to the falling material or debris, but may include cuts bruises, broken bones, cracked or crushed carapaces, and amputations, any of which could result in the animal's death.

Marine animals will likely avoid the project areas on their own due to the on-going activities. In addition, BMPs have been developed to avoid and/or minimize the potential impacts to sea turtles. Some of the BMPs that would be implemented for the proposed project include performing daily surveys, prior to the commencement of work, to insure sea turtles are not within the work zone; work stoppage upon observing a sea turtle within the proposed project area, allowing it to leave on its own; limiting activity beyond the work zone; insuring all objects that are to be placed in the river, are lowered to the bottom in a controlled manner; and use of catchment platforms and protective netting to keep debris from falling into the water. A detailed list of the BMPs that would be implemented for the proposed project is provided in the Avoidance and Minimization Measures section of this document. **Based on the information, FHWA has determined that direct physical impact to sea turtles is extremely unlikely and would be discountable.**

Loss of Foraging Habitat

The Achang Reef Flat Marine Preserve provides foraging habitat for the green sea turtle and the hawksbill sea turtle. This foraging habitat could be degraded or temporarily impacted by various activities associated with the proposed project. Grading and excavating would be the primary activities that could potentially contribute to the degradation or temporary loss of foraging habitat. The release of sediment into Achang Reef Flat Marine Preserve could occur as the existing abutment walls are demolished and removed, soil behind the existing abutment walls is removed, and new grouted riprap is

installed. The sediment released into the Ajayan River could migrate downstream to the Achang Reef Flat Marine Preserve where it would likely disperse and settle on the ocean floor and/or remain suspended in the ocean water. This increase in suspended sediment and sediment deposition within Achang Reef Flat Marine Preserve could damage and /or kill potential food sources for the sea turtles, such as seagrass beds and coral reef communities. Temporary increases in turbidity may also impact habitat quality for foraging sea turtles. However, BMPs have been developed to avoid and minimize impacts to sea turtle foraging habitat as a result of soil erosion, turbidity and/or sediment deposition within the Ajayan River, Ajayan Bay and Achang Reef Flat Marine Preserve. A detailed list of the BMPs that would be implemented for the proposed project is provided in the Avoidance and Minimization Measures section of this document. **Based on this information, FHWA has determined that the loss of potential foraging habitat due to the release of sediment would be discountable and would have insignificant effects on the green and hawksbill sea turtle.**

Exposure to Elevated Noise Levels

Several studies have shown that various anthropogenic activities can generate underwater noise levels that can be detected by a marine species within the range of the particular source. Depending on the species and underwater noise frequency, the underwater noise frequency can induce behavioral responses that are potentially damaging to that species. Construction projects adjacent to, and within the ocean is one of the many activities that can produce underwater sound to a level that it causes an adverse impact upon a marine species. Pile driving, such as that employed for this project, is often the construction activity that produces underwater noise frequencies that are potentially harmful to marine species.

Sea turtle hearing research is limited, but available information about sea turtle sensory biology suggests that they are low frequency specialists, with green sea turtles thought to be most acoustically sensitive between 200 and 700 hertz (Hz)[9]. Because the hearing range of green sea turtles overlaps with the expected frequency range of the pile driving signals, NMFS considers it likely that green sea turtles can hear and respond to pile driving noise. Currently, no acoustic thresholds have been established for sea turtles. However, existing research into sea turtle sensory biology suggests that sea turtles are less acoustically sensitive than cetaceans, relying more heavily on visual cues, rather than auditory input[10&11]. Therefore, application of the marine mammal thresholds would be conservative for sea turtles.

Underwater sound pressure levels are often measured and described in terms of the logarithmic decibel (dB) referenced to a baseline of 1 micropascal (re 1 µPa). To assess the potential impacts of an underwater sound on marine resources, NMFS often assesses impacts based on to root-mean-square ($dB_{rms}$) of an acoustic pulse. This is the portion of the pulse that contains 90% of the sound pressure.

The current acoustic thresholds used by NMFS for marine mammal Permanent Threshold Shift due to exposure to in-water sounds are ≥ 180 dB and ≥ 190 dB for cetaceans and pinnipeds, respectively. Exposure to impulsive in-water sounds at ≥ 160 dB is the threshold onset of Temporary Threshold Shift

[9] Ridgway, S. H., E.G. Wever, J.G. McCormick, J. Palin, and J.H. Anderson. 1969. Hearing in the Giant Sea Turtle, *Chelonia mydas*. PNAS, 64, 884-890.

[10] Hazel, J., I.R. Lawler, H. Marsh, and S. Robson. 2007. Vessel speed increases collision risk for the green turtle *Chelonia mydas*. Endangered Species Research 3: 105-113.

[11] Ridgway, S. H., E.G. Wever, J.G. McCormick, J. Palin, and J.H. Anderson. 1969. Hearing in the Giant Sea Turtle, *Chelonia mydas*. PNAS, 64, 884-890.

and behavioral disturbance for all marine mammals. NMFS considers these to be the thresholds for the onset of adverse effects due to acoustic exposures[12].

An underwater noise analysis was not conducted for the proposed project. Site-specific noise measurements for pile-driving at the Ajayan River are not available. California Department of Transportation's (CALTRANS) Compendium of Pile Driving Sound Data (Compendium)[13] was referenced for reporting sound levels that would closely approximate sound levels for similar piles, driven in a similar manner as this action.

The proposed construction of the Ajayan Bridge **would not** require in-water pile driving. A total of twenty-four octagonal 16.5-inch-diameter concrete piles would be installed on the shoreline above the MHW line. Piles would be installed with an impact hammer, which would generate impulsive in-water sounds.

The CALTRANS Compendium reports measured levels for the driving of 24-inch-diameter octagonal piles on land. Impact driving of 24-inch-diameter octagonal piles on land measured 181 $dB_{rms}$ at a distance of 10 meters from the source[13].

In the absence of site specific transmission loss data, the practical spreading loss equation, RL = SL – 15LogR, is often used to estimate the RL for actions in shallow nearshore marine waters (RL = received level; SL = source level; and R = range in meters (m)). This equation and the received levels reported in the Compendium, as measured at 10 meters for the 24-inch-diameter octagonal concrete piles on land, was used to calculate the following source levels and isopleth ranges (Table 1).

**Table 1. Estimated source levels and ranges to effect threshold isopleths for similar pile driving actions**

| Piling | Driver | Water Depth | Source Level | Range to 180 $dB_{rms}$ | Range to 160 $dB_{rms}$ |
|---|---|---|---|---|---|
| 24" Concrete | Impact | Land | 196 | 12 meters | 251 meters |

Since the proposed 16.5-inch-diameter concrete piles for the subject project is smaller in diameter than the 24-inch-diameter octagonal piles in the CALTRANS reports cited above, we believe this project will generate lower sound levels in-water and have smaller effect threshold isopleths than the similar pile driving actions presented in Table 1. Considering the relatively low number of sea turtles expected to occur within the project area, relatively minimal proposed pile driving, expected short-range of low sound levels that can cause behavioral disturbance, and 50-yard (46-meter) shut-down safety range, it is unlikely any sea turtles would be exposed to adverse sound levels produced by pile driving. **Based on this information, FHWA has determined that elevated noise levels due to the pile driving activities would be discountable and would have insignificant effects on the green and hawksbill sea turtles.**

Construction Lighting Impacts

Sea turtle hatchlings emerge from their nest at night and haul themselves towards the ocean where they will spend their entire life. Upon emerging from the nest, hatchlings typically orient themselves toward the brightest direction, which on natural, undeveloped beaches is commonly toward the open horizon of the ocean. However, on developed beaches, the brightest direction is often away from the ocean and toward the lighted structures located along the nesting beach habitat. Therefore, sea turtle hatchlings are often disoriented and unable to find the ocean, which often leads to high mortality

[12] National Marine Fisheries Service, Pacific Islands Region, Protected Resources Division. 2014. ESA – Section 7 Consultation, Biological Opinion, United States Department of the Navy, X-Ray Wharf Improvements, Naval Base Guam – NMFS File No. (PCTS): PRI-2013-9309, PIRO Reference No.: I-PI-13-1105-LVA

[13] California Department of Transportation (CALTRANS), 2007. Compendium of Pile Driving Sound Data. Prepared by Illinworth & Rodkin, 505 Petaluma Blvd. South, Petaluma, CA 94952. September 27, 2007.

rates[14]. In addition, artificial lighting may deter the adult female sea turtle from emerging from the ocean to excavate a nest and lay her clutch of eggs.

Although unlikely, construction of the proposed project may require work after daylight hours; thereby, facilitating the need to use artificial lighting to illuminate the proposed project area. Therefore, the use of artificial lighting after daylight hours could contribute to disorienting sea turtle hatchlings emerging from their nest and/or discourage an adult female sea turtle from emerging from the ocean to excavate a nest and deposit her clutch of eggs. However, if work is required after daylight hours, the potential impact to sea turtles due to artificial lighting would be minimized by the use of sea turtle friendly lighting; thereby, reducing emitted light from the proposed project area. **Based on this information, FHWA has determined that the exposure to construction lighting would be discountable and would have insignificant effects on the green and hawksbill sea turtles.**

Increased Exposure to Human Interaction

During project construction, there would be an increased presence of human activity that may result in higher incidents of sea turtle and human interaction. The impacts to sea turtles from human interaction would primarily be associated with behavioral changes in the sea turtles that may include avoiding potentially suitable foraging habitat within the Achang Reef Flat Marine Preserve, abrupt body movements while swimming that could cause injury to the sea turtle and may even result in prolonged inactivity at the bottom of the ocean floor[4]. It is unlikely that the increased human presence at the proposed project site would impact sea turtle nesting behavior given that the closest known nesting site is located approximately one mile (1.6 kilometers) to the northeast of the proposed project site. However, BMPs have been developed to avoid and/or minimize the potential impacts to sea turtles from human interaction. Some of the BMPs that would be implemented for the proposed project include performing daily surveys, prior to the commencement of work, to insure sea turtles are not within the work zone; work stoppage upon observing a sea turtle within the proposed project area, allowing it to leave on its own; and limiting activity beyond the work zone. A detailed list of the BMPs that would be implemented for the proposed project is provided in the Avoidance and Minimization Measures section of this document. **Based on the information, FHWA has determined that the exposure to increased human activity would be discountable and would have insignificant effects on the green and hawksbill sea turtles.**

Exposure to Elevated Turbidity

Given that sea turtles breathe air instead of water, increased turbidity should not adversely affect their respiration or other biological functions. Although these animals may be found in turbid waters, it is likely that they may avoid dense turbidity plumes in favor of clearer water. However, BMPs have been developed to avoid and minimize elevated turbidity including use of turbidity curtains and erosion and sediment controls. **Based on this information, FHWA has determined that exposure to any plumes of elevated turbidity related to actions of the project will be non-injurious and will result in insignificant effects to green and hawksbill sea turtles.**

Exposure to Waste and Discharges

Construction wastes may include plastic trash and bags that may be ingested and cause digestive blockage or suffocation. Large plastic trash and discarded sections of ropes and lines may entangle marine life. Equipment spills and discharges could include hydrocarbon-based chemicals such as fuel oils, gasoline, lubricants, hydraulic fluids and other toxicants, which could expose protected species to toxic chemicals. Depending on the chemicals and their concentration, exposure could result in a range of

[14] National Marine Fisheries Service and U.S. Fish and Wildlife Service. 1998. Recovery Plan for U.S. Pacific Population of the Green Turtle (*Chelonia mydas*). National Marine Fisheries Service. Silver Spring, MD.

effects, from avoidance of an area to mortality. Local and federal regulations prohibit the intentional discharge of toxic wastes and plastics into the marine environment. In addition, BMPs have been developed to prevent the introduction of wastes and toxicants in the marine environment. Some of the BMPs that would be implemented for the proposed project include use of catchment platforms and protective netting to keep debris from falling into the water; off-site fueling to the extent feasible; storing and staging of construction materials away from the shoreline and river bank; inspection of equipment; readily available spill kits and absorbent pads; and immediate removal of construction debris from the site. A detailed list of the BMPs that would be implemented for the proposed project is provided in the Avoidance and Minimization Measures section of this document. Based on the information, FHWA has determined that discharges of wastes and toxicants are unlikely. Should a discharge occur appropriate measures would be in place to contain and clean-up the spill. **Based on this information, FHWA has determined that the exposure to wastes and discharges would be discountable and would have insignificant effects on the green and hawksbill sea turtles.**

**Avoidance and Minimization Measures**

To avoid and minimize the potential impacts the proposed project may have upon the federally threatened green sea turtle, federally endangered hawksbill sea turtle and other biological and environmental resource, the FHWA and the DPW have developed numerous BMPs that would be implemented during the life of the proposed project. The BMPs to be implemented and maintained for the proposed project would include, but not limited to, the following:

- The contractor will designate a competent observer to survey the areas adjacent to the proposed action for Green Sea Turtles and Hawksbill Sea Turtles prior to the start of work each day and prior to resumption of work following any break of more than 30 minutes when work is above or in the water when there is a potential to directly impact Green Sea Turtles and Hawksbill Sea Turtles.
- If a Green Sea Turtle or a Hawksbill Sea Turtle is discovered within 50 yards of the proposed work activities with the potential to impact or disturb species shall be postponed or halted. Work shall only begin/resume after the animals have voluntarily departed the area.
- Special attention shall be given to verify that Green Sea Turtles or Hawksbill Sea Turtles are in the area where equipment or materials are expected to contact the substrate before that equipment may enter the water.
- All objects that are to be placed in the river, such as turbidity curtains, riprap, and excavator bucket, shall be lowered to the bottom in a controlled manner. This can include the use of cranes, winches, or other equipment that affect positive control over the rate of decent to minimize turbidity potential.
- No marine vessels, boats, mooring lines or marker buoys shall be utilized.
- Turbidity curtains and tethers shall be minimum length necessary, and shall remain deployed only as long as needed to properly accomplish the required task.
- Deployment sites shall be devoid of live corals, seagrass beds, or other significant resources.
- Work shall be performed during daylight hours to avoid disorienting nesting sea turtles due to nighttime construction lighting. If work is required after daylight working hours, sea-turtle-friendly lighting shall be used to reduce the brightness of the emitted light.

- From September through April, migratory birds protected under the Migratory Bird Treaty Act of 1917, may use the project site as a foraging, nesting, and resting ground. The protected species must not be harmed or harassed.
- Vegetation (habitat) clearing shall be minimized to the maximum extent possible.
- The contractor must consult with the Guam Division of Aquatic and Wildlife Resources at least 1 week prior to any vegetation removal action.
- Focused bird, tree snail, bat surveys shall be performed prior to vegetation removal.
- Activities that result in sediment/pollutant discharges shall cease during the 21 day spawning moratorium (starting 7 to 10 days after the July full moon) for the primary hard coral spawning event each year. Contractor will contact NMFS for exact spawning dates..
- The Ajayan Bridge is located in the Achang Reef Flat Marine Protected Area (MPA). No take of marine organisms is allowed within this MPA. Any take to include killing, damaging, or wounding of marine organisms is a violation of local natural resource laws.
- Wetlands will be designated as Environmentally Sensitive Areas where no construction activities, equipment, or personnel are allowed.
- Appropriate materials to contain and clean potential spills shall be stored at the work site and be readily available. All project-related materials and equipment placed in the water shall be free of pollutants.
- The contractor shall perform daily pre-work equipment inspections for cleanliness and leaks. Heavy equipment operations shall be postponed or halted should a leak be detected, and shall not proceed until the leak is repaired and equipment cleaned.
- Off-site fueling sites shall be used to the maximum extent practical. Should fueling of project-related vehicles or equipment need to occur on-site a designated fueling area will be established at least 50 feet from the shoreline, river bank and wetlands. Project personnel shall be trained on proper fueling and fuel spill cleanup procedures.
- Stockpile, staging, and material storage areas shall be kept at least 50 feet from the shoreline, river bank, and wetlands.
- The contractor shall take appropriate precautions in advance of predicted typhoon events to prevent material losses during surge or flood events, such as relocating materials and equipment to be at least 50 feet from the shoreline and river bank.
- Hazardous materials and petroleum products shall be transported, used, and stored on-site in a manner to prevent contamination of soils and water.
- Spill kits including absorbent pads and other materials shall be readily available on-site.
- Turbidity and siltation from project-related work shall be minimized and contained through the appropriate use of erosion-control practices and effective silt containment devices (e.g., silt fencing and turbidity curtains), and the curtailment of work during adverse weather and tidal/flow conditions.
- An Environmental Protection Plan, Erosion Control Plan, Storm Water Pollution Prevention Plan, litter-control plan, Hazard Analysis and Critical Control Point Plan, and project-specific plans shall be prepared, approved by appropriate regulatory agencies, and implemented.
- Solid and sanitary waste disposal procedures and facilities shall be implemented.

- Erosion-control device(s) shall be employed at the job site to prevent debris and soil from entering the river. Device(s) must be secured and able to withstand heavy rains and winds.
- Catchment platforms and protective netting shall be installed under the bridge to keep debris from falling into the water.
- Construction debris must be removed immediately and not stored at the job site. Debris includes excavated soil, cement material, piping, and asphalt.
- Any material or debris removed from the aquatic environment shall be disposed of at upland sites in accordance with applicable laws and regulations.
- Dust-control devices or methodologies (wetting) must be employed at the job site during construction.
- Absorbent pads shall be readily available at the job site during heavy equipment operations, and equipment must be inspected for leaks prior to use.
- Work shall be conducted below the mean high water line during the dry season and low tides when feasible.
- All heavy equipment shall be kept out of the stream bed and disturbance of the existing stream bed shall be avoided.
- Impacts to strand vegetation along the shoreline shall be avoided to minimize beach erosion. Vegetation shall be replaced as soon as possible along both stream banks and shorelines.
- The Nypa palm community upstream of the bridge shall be avoided.
- River corridor access shall be maintained for aquatic species.
- Disturbed areas will be restored with native plants as soon as possible.
- Invasive species controls shall be maintained to ensure that all materials (human-created and natural) transported from off-site are free of such species (e.g., brown tree snake, rhino beetle, invasive plants).

**Mariana Common Moorhen - Determination of Effects**

The Ajayan River and nearby wetlands provide potential foraging, roosting and nesting habitat for the federally endangered Mariana common moorhen. Given the results of the field surveys, the information provided by the USFWS and the DAWR, the implementation of BMPs and other avoidance and minimization measures, we have determined that the proposed project "***may affect, is not likely to adversely affect***" the federally endangered Mariana common moorhen.

**Mariana Fruit Bat – Determination of Effects**

The Mariana fruit bat is not anticipated to use habitat at or near the proposed project site. Given the results of the field surveys, the information provided by the USFWS and the DAWR, the implementation of BMPs and other avoidance and minimization measures, we have determined that the proposed project will have "***no effect***" on the locally endangered and federally threatened Mariana fruit bat.

**Pacific Tree Snail – Determination of Effects**

Suitable habitat for Pacific tree snail is present within the vicinity of the proposed project. Given the results of the field surveys, the information provided by the USFWS and the DAWR, the implementation of BMPs and other avoidance and minimization measures, we have determined that the proposed project "***may affect, is not likely to adversely affect***" the locally endangered and federally candidate species for listing Pacific tree snail.

**Green Sea Turtle and Hawksbill Sea Turtle - Determination of Effects**

The Ajayan Bay and Achang Reef Flat Marine Preserve provide foraging habitat for the federally threatened green sea turtle and the federally endangered hawksbill sea turtle. Ajayan Bay is not a known turtle nesting site. Therefore, sea turtle nesting is not anticipated. However, potentially suitable nesting habitat is present near the project. Given the results of the field surveys, the information provided by the NMFS, the USFWS, and the DAWR, the implementation of BMPs and other avoidance and minimization measures, we have determined that the proposed project "***may affect, is not likely to adversely affect***" the federally threatened green sea turtle or the federally endangered hawksbill sea turtle.

We trust that we have provided you with the necessary information to evaluate the proposed project and respectfully request your concurrence with our determination of effects for the federally endangered Mariana common moorhen, the locally endangered and federally threatened Mariana fruit bat, the federally threatened green sea turtle and the federally endangered hawksbill sea turtle.

If you require additional information or have any questions, please contact me at (808) 541-2311 or richelle.takara@fhwa.dot.gov.

Sincerely yours,

Richelle M. Takara, P.E.
Transportation Engineer

Enclosure:
1) Project Location Map
2) Photo Log
3) Proposed Geotechnical Soil Boring Locations
4) Bridge Profile
5) Traffic Control Plans
6) BMP Drawings
7) Achang Reef Flat Marine Preserve
8) June 2012 Response from USFWS
9) Flora and Fauna Surveys for the Ajayan Bridge Replacement Project

cc:
Carl V. Dominguez, DPW (via email)
Earl Campbell, USFWS (via email)
Joaquin Blaz, DPW (via email)
Jim Mischler, Parsons Brinckerhoff (via email)
Nora Camacho, Parsons Brinckerhoff (via email)
Nemencio Macario, N.C. Macario (via email)

# United States Department of the Interior

FISH AND WILDLIFE SERVICE
Pacific Islands Fish and Wildlife Office
300 Ala Moana Boulevard, Room 3-122, Box 50088
Honolulu, Hawaii 96850

In Reply Refer To:
2014-I-0382

SEP 15 2014

Ms. Richelle Takara
U.S. Department of Transportation
300 Ala Moana Blvd., Room 3-306
Box 50206
Honolulu, Hawaii 96850

Subject: Informal Consultation for the Route 4 Ajayan Bridge Replacement, Guam

Dear Ms. Takara:

The U.S. Fish and Wildlife Service (Service) received your letter on July 31, 2014, requesting our concurrence that the replacement of the Ajayan Bridge on Route 4 may affect, but is not likely to adversely affect the federally endangered Mariana common moorhen (*Gallinula chloropus guami*) (moorhen), the federally endangered hawksbill sea turtle (*Eretmochelys imbricata*), and the federally threatened green sea turtle (*Chelonia mydas*); and will have no effect on the federally threatened Mariana fruit bat (*Pteropus mariannus mariannus*) (bat). Our analysis and finding in this consultation are based on your letter dated July 31, 2014, and other information available to us. This response is in accordance with section 7 of the Endangered Species Act of 1973 (ESA), as amended (16 U.S.C. 1531 *et seq.*). A complete administrative record is on file in our office.

*Project Description*

The U.S. Department of Transportation, Federal Highway Administration (FHWA), in close coordination with the Guam Department of Public Works (DPW), proposes to replace the Route 4 Ajayan Bridge between the villages of Inarajan and Merizo on Guam. Demolition and construction will each occur in two phases to maintain one passable lane. No new temporary road will be created. A temporary traffic signal will be erected within the roadway to control traffic across the lane in use. The existing bridge and abutments will be demolished using saw cutters, jackhammers and/or hoe rams and removed using mechanical equipment such as backhoes. The soil between the old abutment and the new abutment will be excavated, and riprap will be placed on a gradual slope; a combined total of approximately 540 cubic yards of soil and concrete abutment wall material will be excavated from the mean high water line of the

Ajayan River. The approximate linear disturbance to the stream channel from this excavation will be approximately 407 linear feet. A new bridge foundation will be constructed inland, behind the existing abutment to minimize disturbance to the river channel. The new abutments will be constructed above the mean high water line.

*Conservation Measures*

The following measures are identified in your letter and will be implemented to avoid and minimize potential project effects to nesting sea turtles, moorhens, and bats. Other environmental measures are listed in your request letter, dated July 21, 2014, and incorporated by reference into this consultation. The measures in your letter, including the subset below, are considered part of the project description. Any changes to, modifications of, or failure to implement these avoidance and minimization measures may result in a need to reinitiate this consultation.

1. The contractor will designate a competent observer to survey the areas adjacent to the proposed action for green sea turtles and hawksbill sea turtles prior to the start of work each day and prior to resumption of work following any break of more than 30 minutes when work is above or in the water when there is a potential to directly impact sea turtles.

2. If a sea turtle is discovered within 50 yards (150 feet) of the proposed work activities with the potential to impact or disturb species shall be postponed or halted. Work shall only begin/resume after the animals have voluntarily departed the area.

3. Special attention shall be given to verify that sea turtles are in the area where equipment or materials are expected to contact the substrate before that equipment may enter the water.

4. Work shall be performed during daylight hours to avoid disorienting nesting sea turtles due to nighttime construction lighting. If work is required after daylight working hours, sea-turtle-friendly lighting shall be used to reduce the brightness of the emitted light.

5. Vegetation clearing shall be minimized to the maximum extent possible.

6. The contractor must consult with the Guam Division of Aquatic and Wildlife Resources (DAWR) at least one week prior to any vegetation removal.

7. Focused bird, tree snail, and bat surveys shall be performed prior to vegetation removal.

8. If any special status species are found during these surveys, the Service and DAWR shall be informed as soon as possible. Project workers will wait until any federally listed birds or bats voluntarily leave the area before resuming work. If candidate tree snails are found, contractors will coordinate with DAWR to relocate snails or adjust project footprint to avoid impact to snails.

9. Wetlands will be designated as Environmentally Sensitive Areas where no construction activities, equipment, or personnel are allowed.

10. Stockpile, staging, and material storage areas shall be kept at least 16 yards (50 feet) from the shoreline, river bank, and wetlands.

11. Construction debris must be removed immediately and not stored at the job site. Debris includes excavated soil, cement material, piping, and asphalt.

12. Impacts to strand vegetation along the shoreline shall be avoided to minimize beach erosion. Vegetation shall be replaced as soon as possible along both stream banks and shorelines.

13. The Nipa palm (*Nypa fruticans*) community upstream of the bridge shall be avoided.

14. Disturbed areas will be restored with native plants as soon as possible.

15. Invasive species controls shall be maintained to ensure that all materials transported from off-site are free of such species.

*Project Area*

The action area is along the shoreline of southern Guam at the Ajayan River mouth, which empties into Achang Bay. According to vegetation surveys done for pre-assessment of this project, the project area contains a mix of shoreline, secondary thicket/scrub forest, and ravine/wetland. Pago (*Hibiscus tiliaceus*) and tangantangan (*Leucaena leucocephala*) are common at the site. Other plant species present include coconut trees (*Cocos nucifera*), *Pandanus tectorius*, *Morinda citrifolia*, *Calophyllum inophyllum* and a mix of native and exotic trees and herbaceous species. Nipa palms, wetland obligates, are present slightly upstream from the project area.

*Affected Species*

The Mariana common moorhen, Mariana fruit bat and nesting green and hawksbill sea turtles may occur within the project area. Although there are no recent records of sea turtle nesting in the project area, turtles are present in the area, and nesting has been documented nearby. No proposed or designated critical habitat for the listed species occurs within the project area.

In addition, the Federal candidate Guam tree snail (*Partula radiolata*) may occur within the project area. Although no statutory protection exists for candidate species under the ESA, we encourage conservation of these species to sufficiently remove threats, which could potentially eliminate the need for future listing. We provide the below information on the Guam tree snail for your reference.

Mariana common moorhen

The Mariana common moorhen is federally endangered, and occurs on Guam, Rota, Saipan, and Tinian, with historical records in Pagan (USFWS 1984, 1992). Moorhens occupy both natural and man-made wetland areas, occasionally using brackish water. Habitat use depends on seasons, as they can utilize temporary bodies of water that are more abundant during the rainy season. Population estimates from Guam in 2001 placed the total population at under 300 (Takano and Haig 2004). Although moorhen numbers have declined in wetlands with historical use, such as Fena Reservoir on Navy property (K. Brindock, DoN, pers. comm. 2013), the current numbers, and whether they have declined as a whole in Guam is currently unknown. Threats include damage to habitat by introduced ungulates, predation by introduced predators such as brown treesnakes (*Boiga irregularis*), and development and modification of wetland habitats.

Mariana fruit bat

The Mariana fruit bat (or fanihi in Chamorro) is federally listed as threatened throughout its range. Fanihi rely on forest habitat that contains a diversity of food resources available throughout the year (USFWS 2009). They use both primary and secondary forest habitat for foraging and roosting, and have been observed foraging in non-native forests (USFWS 2009). Although fanihi occur throughout the Marianas Archipelago, healthy populations in the four southern islands are considered essential for recovery (USFWS 2009). Of the southern islands, Guam and Rota have harbored the highest numbers of fanihi in recent history, and have the largest areas of available suitable habitat for the species (USFWS 2009). Population numbers of fanihi in Guam have declined throughout the past century, and current numbers are less than 30 bats. The most recent colony to exist on Guam was at Pati Point, at the northern end of the flight line on Andersen Air Force Base (AAFB). Counts within the past two years have indicated that this colony has been abandoned, but individual fanihi are still observed on AAFB and elsewhere throughout the island (J. Quitigua, DAWR, pers. comm. 2013). Major threats in Guam include hunting by humans, predation on young fanihi by brown treesnakes, and habitat loss and degradation (USFWS 2009).

Green sea turtle

Green sea turtles were once abundant circumglobally in tropical and subtropical waters, but their current numbers are a fraction of their historical abundances (NMFS and USFWS 2007a). They are highly migratory but they faithfully return to natal beaches for nesting. They are known to nest in small numbers in the U.S. Pacific islands, including Guam and the Commonwealth of the Northern Mariana Islands (NMFS and USFWS 1998a). On Guam, green sea turtles have historically nested on multiple beaches throughout the island. Harvesting of green sea turtles and their nests and disturbance at their natal beaches have resulted in accelerated declines (NMFS and USFWS 1998a). Information regarding long-term trends in nesting in the Mariana Islands is limited. However, threats persist at nesting beaches, and nesting is limited to beaches with little to no human disturbance. The main threats to nesting turtles on Guam are habitat destruction and illegal harvest.

Hawksbill sea turtle

Hawksbill sea turtles occur circumglobally in tropical and subtropical waters, including throughout the Pacific, but are scattered in very low numbers (NMFS and USFWS 1998b). Like green sea turtles, they return to natal beaches to nest. Nesting information in the Mariana Islands is limited, but is thought to be in low numbers (NMFS and USFWS 1998b). Less than ten nests have been recorded in Guam in the past two decades (U.S. Navy 2013). Hawksbill sea turtles face many of the same threats that green sea turtles do, including overharvest and disturbances at nesting sites. Hawksbills have also been historically prized for their shells for crafts and jewelry (NMFS and USFWS 1998b). Threats continue to exist at potential nesting beaches throughout Guam, and continued development and human disturbance at beaches decreases available nesting grounds.

Guam tree snails

The Guam tree snail is endemic to the island of Guam. It is listed for protection under Guam law (5 GCA §63205), and has been a candidate for Federal listing since 1994. Tree snails occur in multiple habitat types in Guam (Hopper and Smith 1992), but are most likely to occupy shaded native forest habitats (USFWS 2012). This snail has declined throughout its range due to introduced ungulates, which diminish the quality of their habitat by disrupting the understory; introduced predators such as the Manokwari flat worm (*Platydemus manokwari*), the rosy wolf snail (*Euglandina rosea*), and rats (*Rattus* sp.); and landscape alteration by people (USFWS 2012).

*Conclusion*

We have reviewed the information you provided and pertinent information in our files. Because there are measures in place to survey and to postpone work in the event of a turtle nesting or crawl event, to minimize disturbance to shoreline vegetation and topography, and to avoid light disturbance at night, we do not anticipate direct impacts to nesting turtles. In addition, minimal nesting habitat would be disturbed along the shoreline. Therefore, we concur with your determination that this project may affect, but is not likely to adversely affect nesting sea turtles. Similarly, because disturbance to the aquatic environment would be minimized, wetlands areas (above the high water mark) avoided, and surveys conducted for birds before any vegetation clearing would occur within the project area, we do not anticipate direct impacts to moorhens and impacts to their habitat would be considered insignificant. Therefore, we concur with your determination that this project may affect, but is not likely to adversely affect moorhens.

Mariana fruit bats are not known from any recent sightings near your project. As you are aware, it is the action agency's responsibility to make effect determinations for compliance with section 7(a)(2) of the ESA. We have no regulatory or statutory authority for concurring with "no effect" determinations and do not provide concurrence or non-concurrence on an action agency's "no effect" determination. However, we agree that it is unlikely this species would occur within the project area and in the unlikely event that bats are present, we agree with your proposed measures for bats.

Although suitable habitat for tree snails occurs within the project area, it is likely they would have been documented in previous surveys to occur within the project area. We appreciate your plans to survey for snails before any vegetation removal. The Service requests that you share any new information on tree snail occurrences that result from your project survey work.

If you have any additional questions, please contact Ann Marie Gawel, Fish and Wildlife Biologist (phone: 671-355-4008; email: annmarie_gawel@fws.gov).

Sincerely,

for Earl Campbell
Acting Mariana Island Team Manager

cc: Department of Agriculture, Division of Aquatic and Wildlife Resources

*Literature Cited*

Brindock, K. 2013. Personal Communication. Conversation. Naval Facilities and Engineering, Environmental Division.

Hopper, D. and B.D. Smith. 1992. Status of tree snails (Gastropoda: Partulidae) on Guam, with a resurvey of sites studied by H.E. Crampton in 1920. Pacific Science 46: 77-85.

National Marine Fisheries Service and U.S. Fish and Wildlife Service. 1998a. Recovery Plan for U.S. Pacific Populations of the Green Turtle (*Chelonia mydas*). NMFS, Silver Spring, MD. 97 pp.

_____. 1998b. Recovery Plan for U.S. Pacific Populations of the Hawksbill Turtle (*Eretmochelys imbricata*). NMFS, Silver Spring, MD. 95 pp.

_____. 2007a. Green Sea Turtle (*Chelonia mydas*). 5-Year Review: Summary and Evaluation. 105 p.

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Takano, L. and S. Haig. 2004. Distribution and abundance of the Mariana subspecies of the common moorhen. Waterbirds 27:245–250.

U.S. Fish and Wildlife Service. 1984. Endangered and Threatened Wildlife and Plants; Determination of Endangered Status for Seven Birds and Two Bats of Guam and the Northern Mariana Islands. Federal Register 49:33881-33885.

____ 1992. Recovery plan for the Mariana common moorhen, *Gallinula chloropus guami*. U.S. Fish and Wildlife Service, Portland, OR.

____ 2009. Draft Revised Recovery Plan for the Mariana Fruit Bat or Fanihi (*Pteropus mariannus mariannus*). 83 pp.

____ 2012. Endangered and Threatened Wildlife and Plants; Review of Native Species That Are Candidates for Listing as Endangered or Threatened; Annual Notice of Findings on Resubmitted Petitions; Annual Description of Progress on Listing Actions. Federal Register Vol. 77, No. 225

U.S. Navy. 2013. Final Joint Region Marianas Integrated Natural Resource Management Plan. June 2013

## G.10 United States Army Corp of Engineers

AECOM
1001 Bishop Street
Suite 1600
Honolulu, HI 96813
www.aecom.com

808 523 8874 tel
808 523 8950 fax

April 17, 2012

Mr. Ryan Winn
Department of the Army
U.S. Army Corps of Engineers
Guam Field Office
PSC 455 BOX 188 FPOAP 96540-1088

Subject: Jurisdictional Determination for Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act for Ajayan Bridge Replacement Project, Merizo, Guam

Dear Mr. Winn:

The U.S. Department of Transportation - Federal Highways Administration (FHWA), in coordination with the Guam Department of Public Works (DPW) proposes to replace the existing Ajayan River Bridge located on Route 4, on the boundary between Merizo and Inarajan. AECOM is contacting your agency on behalf of the DPW and FHWA. A Categorical Exclusion document for compliance with the National Environmental Policy Act (NEPA) will be prepared for the project.

**Ajayan Bridge Existing Condition**
The Ajayan River Bridge is located on Route 4 on the boundary between Merizo and Inarajan, as shown in Figure 1-1.

The existing single span cast-in-place concrete box girder bridge was constructed in 1968 with a span of approximately 76.2 feet and a skew of 40 degrees. Abutments are founded on concrete piles and the deck has an asphalt concrete wearing surface. The most recent bridge inspection report, dated May 27, 2004, noted that the substructure and channel are rated in serious condition with cracking and differential movement noted for substructure units and significant scour at abutments, as shown in the attached Photo Log. The channel alignment and waterway opening are also noted as deficient.

**Proposed Action**
The proposed action would replace the existing two-lane bridge across the Ajayan River just upstream of the river mouth as it enters the ocean. Bridge abutment slopes would be protected from erosion by placement of stone rip rap. There would be minimal roadway approach work. Proposed improvements include two 12-foot lanes with 8-foot paved shoulders. Roadway alignment and grade would match existing at points of tie-in. Roadway work within project limits would include removal of the existing pavement and design of full-depth pavement replacement and replacement of guardrail. The proposed action would include geotechnical sampling, testing, and analysis. As shown in Figure 1-2, soil borings for bridge foundations would be taken at two locations, one at each proposed substructure unit, to a depth of at least 100 feet or at least 10 feet into competent bedrock, whichever is shallower. Additionally, two shallow borings to a depth of 15 feet would be taken within the roadway approach area. All work would be conducted within existing right-of-way.

AECOM

The FHWA requests that you review the project information provided above to determine if there are any permits required under Section 404 of the Clean Water Act, Section 10 of the Rivers and Harbors Act, or any other concerns. On behalf of FHWA, we respectfully request your jurisdictional determination for Section 404 and Section 10 for this project within 30 days. If you should have any questions, please feel free to contact me at 808.356.5394 (office), 808.223.9213 (cell), or via email at Jennifer.Scheffel@aecom.com.

Sincerely,

Jennifer M. Scheffel
Environmental Planner

Enclosures: Figure 1-1: Project Location Map
Figure 1-2: Geotechnical Boring Locations
Photo Log

cc: Ms. Richelle Takara, FHWA
Joanne M. S. Brown, DPW
Ramon Padua, DPW
Joaquin Blaz, DPW
Lynda Aguon, DPR SHPO
Paul Wolf, PB
James Mischler, PB
Nora Camacho, PB
Gene Niemasz, PTG
Mr. Edgar Hipolito, AECOM
Kosal Krishnun, AECOM
Jennifer Scheffel, AECOM
Mr. Nemencio Macario, N.C. Macario & Associates, Inc.

REPLY TO
ATTENTION OF
:

**DEPARTMENT OF THE ARMY**
**U.S. ARMY CORPS OF ENGINEERS, HONOLULU DISTRICT**
**Guam Field Office, PSC 455, Box 188, FPO AP 96540**

October 12, 2012

Regulatory Branch **File No.** POH-2012-00229

Ms. Julie Zimmerman
AECOM
1001 Bishop Street, Suite 1600
Honolulu, Hawaii 96813

Dear Ms. Zimmerman:

This is in response to your request, on behalf of the Federal Highways Administration (FHWA), for a Department of the Army (DA) jurisdictional determination for the proposed Ajayan Bridge Replacement Project. The proposed project is located at the intersection of the Ajayan River and Ajayan Bay, on Route 4, between Merizo and Inarajan, Guam. This regulatory action has been assigned file number POH-2012-00229, which should be referred to in all future correspondence with this office.

Section 404 of the Clean Water Act (CWA) requires that a DA permit be obtained for the placement or discharge of dredged and/or fill material into waters of the U.S., including jurisdictional wetlands (33 U.S.C. 1344). The Corps defines wetlands as those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. The tidal waters of Ajayan Bay of the Pacific Ocean are navigable waters of the U.S.

Therefore, DA authorization is required under Section 404 of the CWA if the bridge replacement would involve a discharge of dredged and/or fill material below the high tide line (HTL) of Ajayan Bay/River and/or into adjacent wetlands. As we have discussed, if the proposed riprap bank armoring, bridge abutments or wingwall would extend below the HTL, or if the proposed roadway approach would be widened into adjacent delineated wetlands, a DA permit would be required.

Nothing in this letter excuses you from compliance with other Federal, State, or local statutes, ordinances, or regulations. You may contact me via email at ryan.h.winn@usace.army.mil, by mail at the address above, or by phone at (671) 339-2108 if you have questions. For additional information about our Regulatory Program, visit our web site at www.poa.usace.army.mil/reg.

Sincerely,

Ryan H. Winn
Project Manager

## G.11 United States Coast Guard

## Johnson, Landin

**From:** Zimmerman, Julie
**Sent:** Monday, August 27, 2012 5:17 PM
**To:** 'Thomas.E.Whitaker@uscg.mil'
**Cc:** Scheffel, Jennifer
**Subject:** Ajayan Bridge Replacement Project- Section 9 Consultation
**Attachments:** AJAYAN-S5.pdf; AJAYAN-DWG-65%_062512.pdf

Thomas:

I am working with Ryan Winn of the U.S. Army Corps of Engineers regarding the Ajayan Bridge Replacement project. Ryan instructed me to contact you to find out if the USCG will require authorization under Section 9 of the Rivers and Harbors Act.

The U.S. Department of Transportation - Federal Highways Administration (FHWA), in coordination with the Guam Department of Public Works (DPW) proposes to replace the existing Ajayan River Bridge located on Route 4, on the boundary between Merizo and Inarajan. The purpose of this project is to replace the existing bridge to meet increasing populations, upgrade to current code requirements, provide adequate travel lane widths, roadway safety, and accommodate river flow capacity.

The Ajayan Bridge is located on Route 4, in the eastern section of Merizo. The two (2) lanes bridge crosses the Ajayan river just upstream the river mouth as it enters the ocean. The existing single span cast-in-place concrete box girder bridge was constructed in 1968 with a span of approximately 76.2 feet and a skewed of 40 degrees. Abutments are founded on concrete piles and the deck has an asphalt concrete wearing course. Proposed improvements shall include two (2) 12 feet lanes with 8 feet paved shoulders. Roadway alignment and grade shall match existing at the point of tie-in.

I am sending the construction plans (65%) for the Ajayan Bridge project. The only work to be done below the ordinary high water mark includes the precast piles supporting the integral abutments of the bridge will be driven to depths underground water level. The attached "Ajayan-S5" provides further details on this.

Please let me know if you have any questions or need any further information in order to make a determination regarding Section 9 .

Thank you,
Julie

Julie M. Zimmerman
Environmental Planner
Environment
Direct 808.356.5392 Fax 808.523.8950
Julie.Zimmerman@aecom.com

**AECOM**
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U.S. Department of Homeland Security
United States Coast Guard

Commander
Fourteenth Coast Guard District

300 Ala Moana Blvd, 9-216
Honolulu, HI 96850-4982
Staff Symbol: (dpw)
Phone: (808) 541-2320
Fax: (808) 541-2309

16590
30 Oct 12

Mrs. Julie Zimmerman
Environmental Planner, AECOM
1001 Bishop Street, Suite 1600
Honolulu, HI 96813

Dear Mrs. Zimmerman,

Coast Guard District Fourteen has reviewed your 4 September 2012 proposal to replace of the Ajayan Bridge located over the Ajayan River, Guam. This information was used to determine the extent of the Coast Guard's involvement in the permitting process.

The Ajayan River is tidally influenced and subject to Coast Guard jurisdiction. However, at the site of the proposed bridge, it does not appear that any vessels other than canoes, rowboats, rafts and small motorboats are able to transit the waterway. Therefore, this location is in our advance approval category for permitting the construction of bridges, pursuant to 33 CFR 115.70. Accordingly, a specific Coast Guard bridge permit will not be required for the project.

Plans for the proposed bridge must provide adequate clearances to pass existing and future high water stages and have no significant impact on the environment. Prior to construction of the proposed bridge, you must check with your local authorities and confirm there are no flooding issues associated with the construction. Where no formal permit is required, the bridge must meet all current needs and/or requirements of navigation. If conditions are found to differ significantly from those you have presented and by which this determination is granted, you could be required to apply for a permit and possibly alter the bridge to meet the needs of navigation.

This authorization is valid for a period of two years to commence construction and five years to complete construction from the date of this letter. Should you not adhere to this time frame, you must resubmit documents for Coast Guard review to ensure that conditions have not changed which would preclude the project from meeting the criteria for advance approval.

Maintenance of the bridge is the responsibility of the owner. If the bridge falls into disrepair or is no longer used for its intended purpose, it must be removed by and at the expense of the owner in its entirety. The bridge must be maintained free and clear of debris at all times.

Additionally, this office has determined that the Ajayan River Bridge does not have significant nighttime navigation and, as such, is exempt from any lighting and or signal requirements as per 33 CFR 118.40.

This determination does not relieve you of your responsibility to obtain appropriate permits from any other federal, state or local agency having jurisdiction in this matter.

If you have any questions or concerns, please do not hesitate to contact my representative in this matter, LT Doug Miller, at (808) 541-2319 or Douglas.J.Miller@uscg.mil.

Sincerely,

BRIAN J. HOFFERBER
Commander, U. S. Coast Guard
Chief, Waterways Management Branch
By direction

Copy: USCG Sector Guam

# Appendix H
# BMPs and Minimization Measures

| **Best Management Practices and Minimization Measures** |
| --- |
| The contractor shall remain vigilant for the presence of federally and locally protected species (e.g., Endangered Species Act [ESA], Marine Mammal Protection Act [MMPA], Migratory Bird Treaty Act [MBTA], Guam Comprehensive Wildlife Conservation Strategy) during construction. The contractor shall designate a competent observer to survey the areas adjacent to the proposed action for federally and locally protected species prior to the start of work each day and prior to resumption of work following any break of more than 30 minutes. |
| Should protected species be discovered within 50 yards of the proposed work activities with the potential to impact or disturb species shall be postponed or halted. Work shall only begin/resume after the animals have voluntarily departed the area. |
| No marine mammals or sea turtles may be within 50 yards of pile-driving. Pile-driving shall be postponed or halted until the animals have voluntarily moved beyond the 50-yard safety zone. |
| No pile-driving shall be conducted after dark unless that work has proceeded uninterrupted since at least 1 hour prior to sunset, and no protected species have been observed within or near the 50-yard range for that work. |
| Special attention shall be given to verify that no protected marine animals are in the area where equipment or materials are expected to contact the substrate before that equipment may enter the water. |
| All objects that are to be placed in the river, such as turbidity curtains, riprap, excavator bucket, and piles, shall be lowered to the bottom in a controlled manner. This can include the use of cranes, winches, or other equipment that affect positive control over the rate of decent to minimize turbidity potential. |
| No marine vessels, boats, mooring lines or marker buoys shall be utilized. |
| Turbidity curtains and tethers shall be minimum length necessary, and shall remain deployed only as long as needed to properly accomplish the required task. |
| Deployment sites shall be devoid of live corals, seagrass beds, or other significant resources. |
| Work shall be performed during daylight hours to prevent disturbance to nearby residents and to avoid disorienting nesting sea turtles due to nighttime construction lighting. If work is required after daylight working hours, sea-turtle-friendly lighting shall be used to reduce the brightness of the emitted light. |
| From September through April, migratory birds protected under the Migratory Bird Treaty Act of 1917, may use the project site as a foraging, nesting, and resting ground. The protected species must not be harmed or harassed. |
| Vegetation (habitat) clearing shall be minimized to the maximum extent possible. |
| The contractor must consult with the Guam Division of Aquatic and Wildlife Resources at least 1 week prior to any vegetation removal action. |
| Focused bird, tree snail, and bat surveys shall be performed prior to vegetation removal. |
| In-water work shall stop during coral spawning. Coral spawning takes place around the last quarter moon of July and August. No in-water work shall take place within 3 days of this moon phase. |
| The Ajayan Bridge is located in the Achang Reef Flat Marine Protected Area (MPA). No take of marine organisms is allowed within this MPA. Any take to include killing, damaging, or wounding of marine organisms is a violation of local natural resource |

| **Best Management Practices and Minimization Measures** |
|---|
| laws. |
| Appropriate materials to contain and clean potential spills shall be stored at the work site and be readily available. All project-related materials and equipment placed in the water shall be free of pollutants. |
| The contractor shall perform daily pre-work equipment inspections for cleanliness and leaks. Heavy equipment operations shall be postponed or halted should a leak be detected, and shall not proceed until the leak is repaired and equipment cleaned. |
| Off-site fueling sites shall be used to the maximum extent practical. Should fueling of project-related vehicles or equipment need to occur on-site a designated fueling area will be established at least 50 feet from the shoreline, river bank and wetlands. Project personnel shall be trained on proper fueling and fuel spill cleanup procedures.. |
| Stockpile, staging, and material storage areas shall be kept at least 50 feet from the shoreline, river bank, and wetlands. |
| The contractor shall take appropriate precautions in advance of predicted typhoon events to prevent material losses during surge or flood events, such as relocating materials and equipment to be at least 50 feet from the shoreline and river bank. |
| Hazardous materials and petroleum products shall be transported, used, and stored on-site in a manner to prevent contamination of soils and water.<br>Spill kits including absorbent pads and other materials shall be readily available on-site. |
| Turbidity and siltation from project-related work shall be minimized and contained through the appropriate use of erosion-control practices and effective silt containment devices (e.g., silt fencing and turbidity curtains), and the curtailment of work during adverse weather and tidal/flow conditions. |
| An Environmental Protection Plan, Erosion Control Plan, Storm Water Pollution Prevention Plan, litter-control plan, Hazard Analysis and Critical Control Point Plan, and project-specific plans shall be prepared, approved by appropriate regulatory agencies, and implemented. |
| Solid and sanitary waste disposal procedures and facilities shall be implemented. |
| Erosion-control device(s) shall be employed at the job site to prevent debris and soil from entering the river. Device(s) must be secured and able to withstand heavy rains and winds. |
| Catchment platforms and protective netting shall be installed under the bridge to keep debris from falling into the water. |
| Construction debris must be removed immediately and not stored at the job site. Debris includes excavated soil, cement material, pipings, and asphalt. |
| Any material or debris removed from the aquatic environment shall be disposed of at upland sites in accordance with applicable laws and regulations. |
| Dust-control devices or methodologies (wetting) must be employed at the job site during construction. |
| Absorbent pads shall be readily available at the job site during heavy equipment operations, and equipment must be inspected for leaks prior to use. |
| Work shall be conducted below the mean high water line during the dry season and low tides when feasible. |
| All heavy equipment shall be kept out of the stream bed and disturbance of the existing stream bed shall be avoided. |

| **Best Management Practices and Minimization Measures** |
| --- |
| Impacts to strand vegetation along the shoreline shall be avoided to minimize beach erosion. Vegetation shall be replaced as soon as possible along both stream banks and shorelines. |
| “Soft” approaches in lieu of impervious “hard” stabilization and modifications shall be used whenever possible to slow streamflow and allow for water infiltration. |
| Hydrodynamics and sedimentation patterns shall be properly modeled and designed to avoid erosion to adjacent properties when “hard” stabilization is deemed necessary. |
| The Nypa palm community upstream of the bridge shall be avoided. |
| River corridor access shall be maintained for aquatic species. |
| Invasive species controls shall be maintained to ensure that all materials (human-created and natural) transported from off-site are free of such species (e.g., brown tree snake, rhino beetle, invasive plants). |

# Appendix I
# Achang Reef Flat Marine Preserve


**Location Map**


**Legend**

- Ajayan Bridge
- Achang Reef Flat Marine Preserve
- Ajayan River

**Notes**

1. Base Map: USDA NRCS Orthophoto Mosaic, 60 cm ground resolution
2. Map projection: WGS 84 UTM Zone 55 N

N

0 50 100 Feet

**Figure 2**
**Achang Reef Flat**
**Marine Preserve**
**Ajayan Bridge Replacement**
**Merizo, Guam**

H:\data\Compliance\60241605 - Ajayan Bridge\7.0 Deliverables\7.6 GIS\7.6.1 Working\7.6.1.1 Ajayan Bridge CatEx\7.6.1.2 MXD\Figure 2 - Marine Preserves.mxd

# Appendix J
# Marine Protected Species of the Mariana Islands

# MARINE PROTECTED SPECIES of the MARIANA ISLANDS

National Marine Fisheries Service, Pacific Islands Regional Office

## MARINE MAMMALS

All marine mammals are protected under the Marine Mammal Protection Act. Those identified under the ESA Listing are also protected under the Endangered Species Act.

| Common Name | Scientific Name | ESA Listing |
|---|---|---|
| Blue Whale | *Balaenoptera musculus* | Endangered |
| Blainville's Beaked Whale | *Mesoplodon densirostris* | |
| Bryde's Whale | *Balaenoptera edeni* | |
| Cuvier's Beaked Whale | *Ziphius cavirostris* | |
| Dwarf Sperm Whale | *Kogia simus* | |
| False Killer Whale | *Pseudorca crassidens* | |
| Fin Whale | *Balaenoptera physalus* | Endangered |
| Humpback Whale | *Megaptera novaeangliae* | Endangered |
| Killer Whale | *Orcinus orca* | |
| Long-Finned Pilot Whale | *Globicephala melaena* | |
| Longman's Beaked Whale | *Indopacetus pacificus* | |
| Melon-Headed Whale | *Peponocephala electra* | |
| Minke Whale | *Balaenoptera acutorostrata* | |
| Pygmy Killer Whale | *Feresa attenuata* | |
| Pygmy Sperm Whale | *Kogia breviceps* | |
| Sei Whale | *Balaenoptera borealis* | Endangered |
| Short-Finned Pilot Whale | *Globicephala macrorhynchus* | |
| Sperm Whale | *Physeter macrocephalus* | Endangered |
| | | |
| Bottlenose Dolphin | *Tursiops truncatus* | |
| Common Dolphin | *Delphinus delphis* | |
| Fraser's Dolphin | *Lagenodelphis hosei* | |
| Pantropical Spotted Dolphin | *Stenella attenuata* | |
| Risso's Dolphin | *Grampus griseus* | |
| Rough-toothed Dolphin | *Steno bredanensis* | |
| Spinner Dolphin | *Stenella longirostris* | |
| Striped Dolphin | *Stenella coeruleoalba* | |
| | | |
| Dugong* | *Dugong dugon* | Endangered |
| | | |
| Northern Elephant Seal | *Mirounga angustirostris* | |

## SEA TURTLES

All sea turtles are protected under the Endangered Species Act.

| Common Name | Scientific Name | ESA Listing |
|---|---|---|
| Green Turtle | *Chelonia mydas* | Threatened |
| Hawksbill Turtle | *Eretmochelys imbricata* | Endangered |
| Leatherback Turtle | *Dermochelys coriacea* | Endangered |
| Olive Ridley Turtle | *Lepidochelys olivacea* | Threatened |

* Dugongs are under the jurisdiction of the US Fish and Wildlife Service.

Last updated April 2008

# Appendix K
# Flora and Fauna Surveys for Ajayan Bridge Replacement Project (SWCA 2013)

SWCA®
ENVIRONMENTAL CONSULTANTS
Sound Science. Creative Solutions.

2013

# Flora and Fauna Surveys for Ajayan Bridge Replacement Project

Prepared by
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Tamuning, Guam 96913

Revised 1/17/2014

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## ACRONYMS and KEY TERMS

| | |
|---|---|
| ac | acre |
| cm | centimeters |
| ft | feet |
| GDAWR | Guam Division of Aquatic and Wildlife Resources |
| h | hours |
| ha | hectare |
| in | inch |
| km | kilometer |
| m | meter |
| mm | millimeters |
| mi | mile |
| SOGCN | Species of Greatest Conservation Need (Guam locally listed species) |
| sp. | species (singular) |
| spp. | species (plural) |

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## EXECUTIVE SUMMARY

SWCA conducted flora and fauna surveys in the project area for the proposed Ajayan Bridge replacement project. Survey efforts addressed terrestrial flora and fauna. During these surveys, emphasis was placed on identifying special status species including species listed as threatened or endangered under the Endangered Species Act, species listed as threatened or endangered under Guam Endangered Species Regulation No. 9 (5 GCA, Sect. 63.205(c). as well as species considered to be Species of Greatest Conservation Need (SOGCN) by GDAWR.

Key findings within the survey area and its immediate vicinity include:

- No federally or locally listed reptiles, amphibians, birds, mammals, or terrestrial flora were found within the boundaries of the project area;
- No Mariana common moorhens were observed during surveys; however, the area contains suitable habitat for moorhen directly adjacent to the area that will be cleared, therefore we do not dismiss the possibility of moorhens using the area for foraging, nesting, and resting;
- No known turtle nests are located at the project site; however turtles have been known to nest within one mile of the project site and have been observed foraging in the area;
- No species considered to be SOGCN were found during the surveys;

### Recommendations

While no federally or locally listed endangered species were observed during site surveys, Marianas common moorhens and sea turtles could potentially be present on or near the project area. SWCA recommends pre-construction surveys to avoid potential harm to these species.

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# 1.0 PROJECT DESCRIPTION

## 1.1 Purpose and Justification

The U.S. Department of Transportation- Federal Highways Administration (FHWA), in coordination with the Guam Department of Public Works (DPW) proposes to replace the existing Ajayan River Bridge located on Route 4, on the boundary between Merizo and Inarajan. The structure is failing as a result of exposure to severe weather, particularly strong storms bringing torrential rain, and due to humidity and age. Department of Public Works (DPW) will replace the existing bridge with a superstructure. N.C. Macario and Associates contracted SWCA Environmental Consultants (SWCA) to conduct an environmental analysis of the area that will be impacted by clearing, grading, demolition, excavation, and construction of the replacement bridge (Figure 1).

## 1.2 Location of Project Site

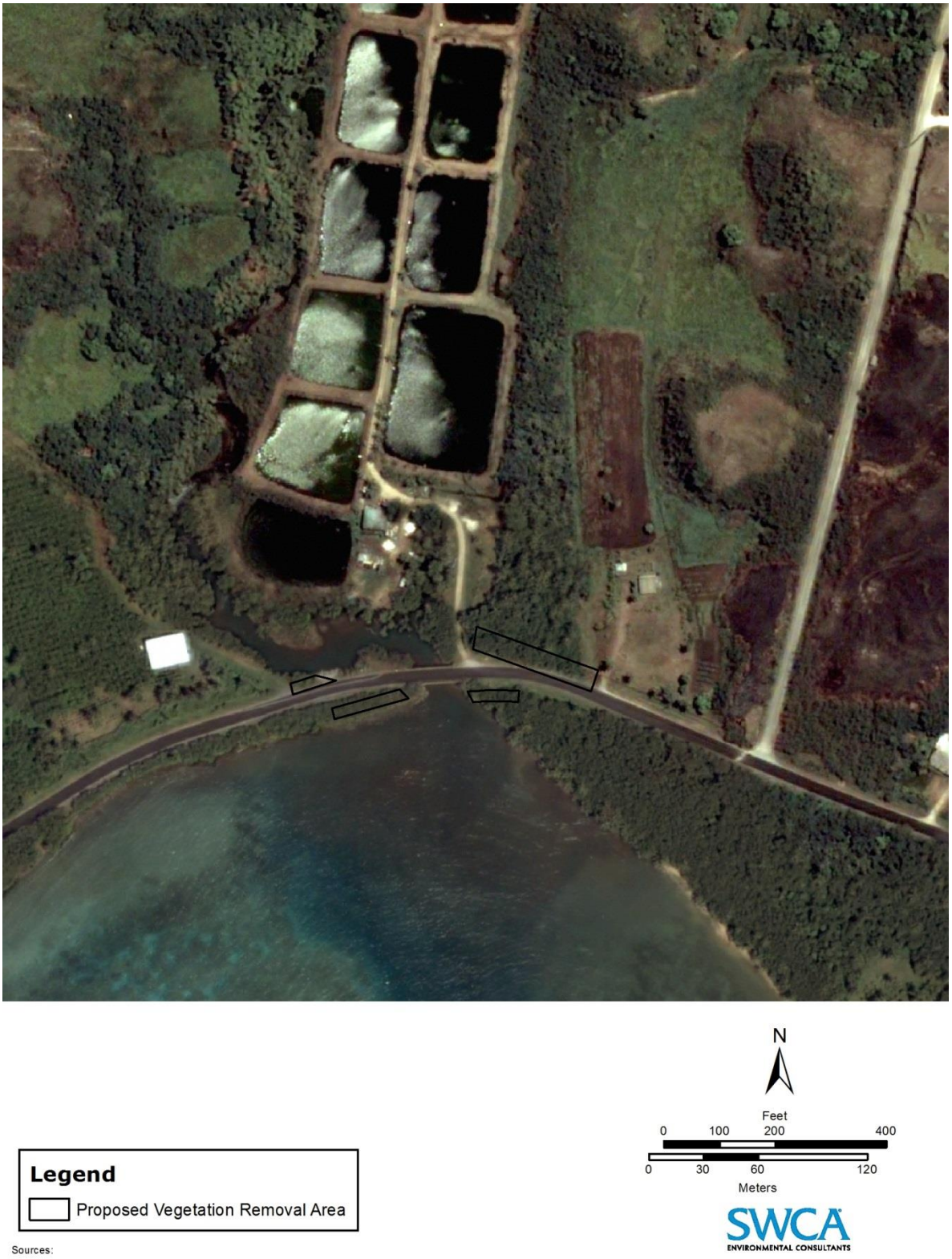
Situated in southern Guam, the Ajayan Bridge lies across the Ajayan River bordering the Inarajan and Merizo Municipalities on Route 4 near the University of Guam Agricultural Experiment Station (Figure 2).

## 1.3 Proposed Actions

The proposed action involves clearing, grading, excavating, and construction in the vicinity of the bridge crossing Route 4 in Merizo. The existing bridge will be demolished and replaced with a new 40-ft (12-m) wide by 105-ft (32-m) long bridge. The proposed improvements include two 12-ft (4-m) lanes with 8-ft (2.5 m) paved shoulders. The immediate project area is identified as four individual parcels of land distributed on the east and west sides of the existing bridge. The area of each parcel is as follows: 1,295 $ft^2$ (120 $m^2$), 1,752 $ft^2$ (162 $m^2$), 2,666 $ft^2$ (247 $m^2$), and 9,191 $ft^2$ (853 $m^2$).

Figure 1. Ajayan Bridge Terrestrial Fauna and Flora Survey Project Site Overview

Figure 2. Ajayan Bridge Replacement Project Site



# 2.0 ENVIRONMENTAL SETTING

## 2.1 Environment

Guam has more freshwater vegetation types and overall freshwater areas than other islands in the Marianas. These areas include streams, rivers, and various types of wetlands (freshwater swamps, marshes, man-made reservoirs, mangroves) (Wiles and Ritter 1993, GDAWR 2006b). Freshwater wetland areas are estimated to cover approximately 0.6 percent of the island's area (GDAWR 2006b).

All fresh water on Guam accumulates from rainfall, which averages about 85–115 in/year (216–292 cm/year) (Gingerich 2003). Ranging in length from less than 0.6 mi (1 km) to greater than 3 mi (5 km), Guam's 100 rivers and streams occur in the south and central regions. Low permeability of volcanic rock slows the infiltration of rainwater, allowing groundwater discharge to streams. Clay or argillaceous limestone soils slow water percolation, permitting surface waters to accumulate (Gingerich 2003, GDAWR 2006b). This contrasts Guam's northern limestone plateau which permit rapid seepage of water (Wiles and Ritter 1993).

The proposed project area is situated between the in the Inarajan watershed and Manell watershed  It has a drainage area of about 8.55 square miles and 4.55 square miles, respectively.  The main rivers of the Inarajan watershed include Ajayan River, Pasananu River, Fintasa River, Inarajan River, Dante River, Fensol River, Topany River, Nelansa River, Tongan River, Yledigao River, and Laolao River.  The main rivers of the Manell watershed include Ajayan River, Nelansa River, Laolao River, Fintasa River, Liyog River and Asgalao Creek.

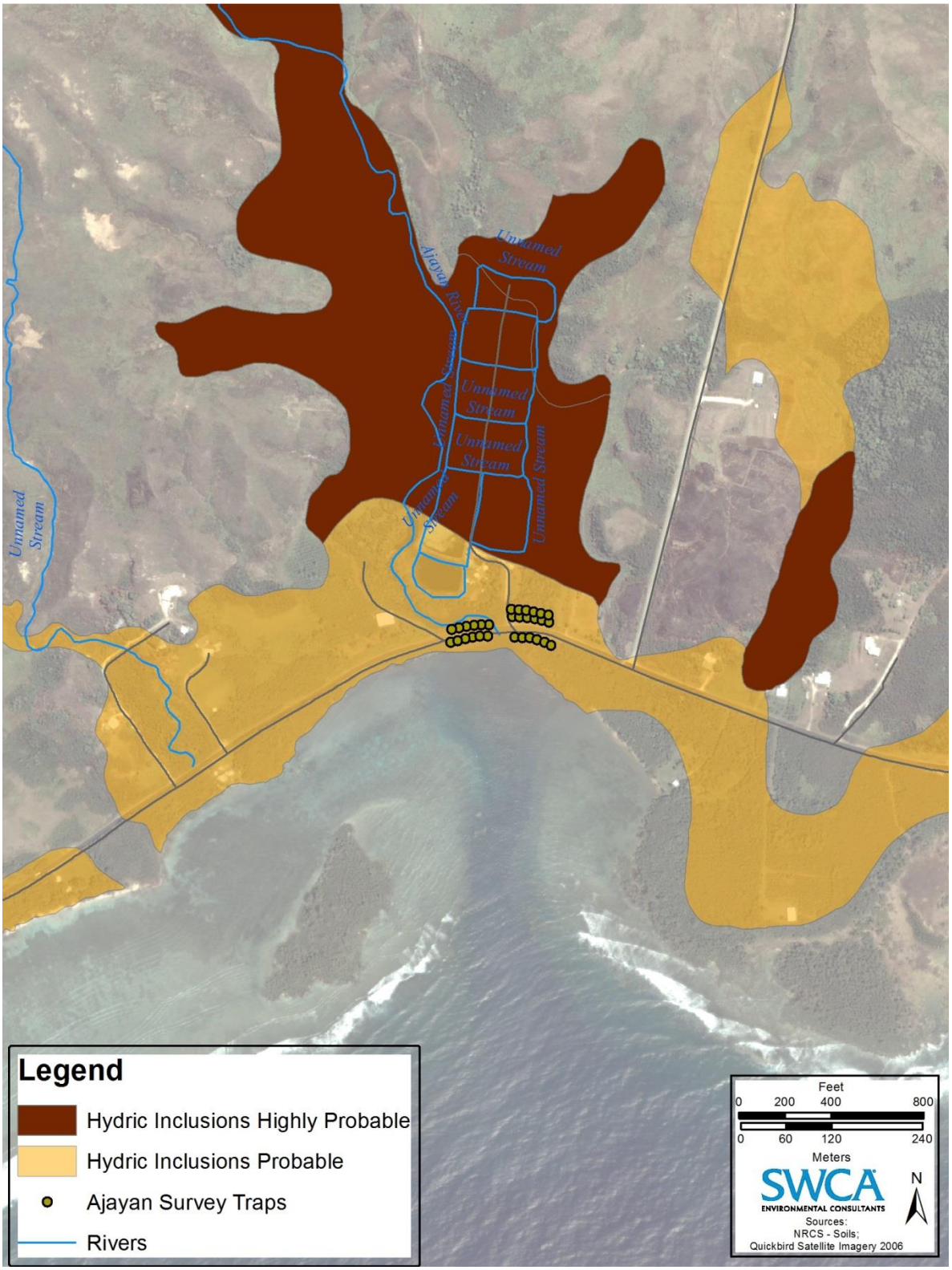
The Ajayan Bridge is situated on the southern end of the Ajayan River, adjacent to the Ajayan Bay discharge point.

## 2.2 Soils

Guam's soils form from two basic parent types, volcanic and coralline limestone. Laterite soils, which derive from volcanically generated rocks (namely basalt) can mix with basic coralline soils to form the argillaceous clays found in the central and southern regions of the island (Stone 1970). The soils of southern Guam are generally impervious, reddish or yellowish, acidic soils and clays formed on deeply weathered volcanic rock (Young 1988).

In the Inarajan watershed are the soil types Ylig clay, Togcha-Akina silty clays, Sasalaguan clay, Pulantat clay, Inarajan clay, Chacha clay, badland, Ajayan clay, Shioya loamy sand, rock and urban land complex (WERI 2011a). The soil types in the Manell watershed mainly include Ylig clay, Akina silty clay, Akina-Atate silty clays, Sasalaguan clay, Pulantat clay, Lulantat-Kagman clays, Inarajan clay, Togcha-Akina silty clay, badland, Agfayan clay, Shioya loamy sand, rock and urban land complex.  Soils on the proposed project site are probable for hydric inclusions (Figure 3) and fall within area characterized as Inarajan clay

Figure 3. Hydric Inclusions Probability



(Figure 4). Inarajan clay is a very deep, poorly drained, slowly permeable soil that occurs along valley bottoms and coastal planes. This soil forms from alluvium derived from volcanic rock. Alluvium is composed of material, such as sand, silt, or clay deposited on land by streams. Vegetation that grows in uncultivated areas of Inarajan clay are mainly wetland plants, grasses, and sedges (Young 1988).

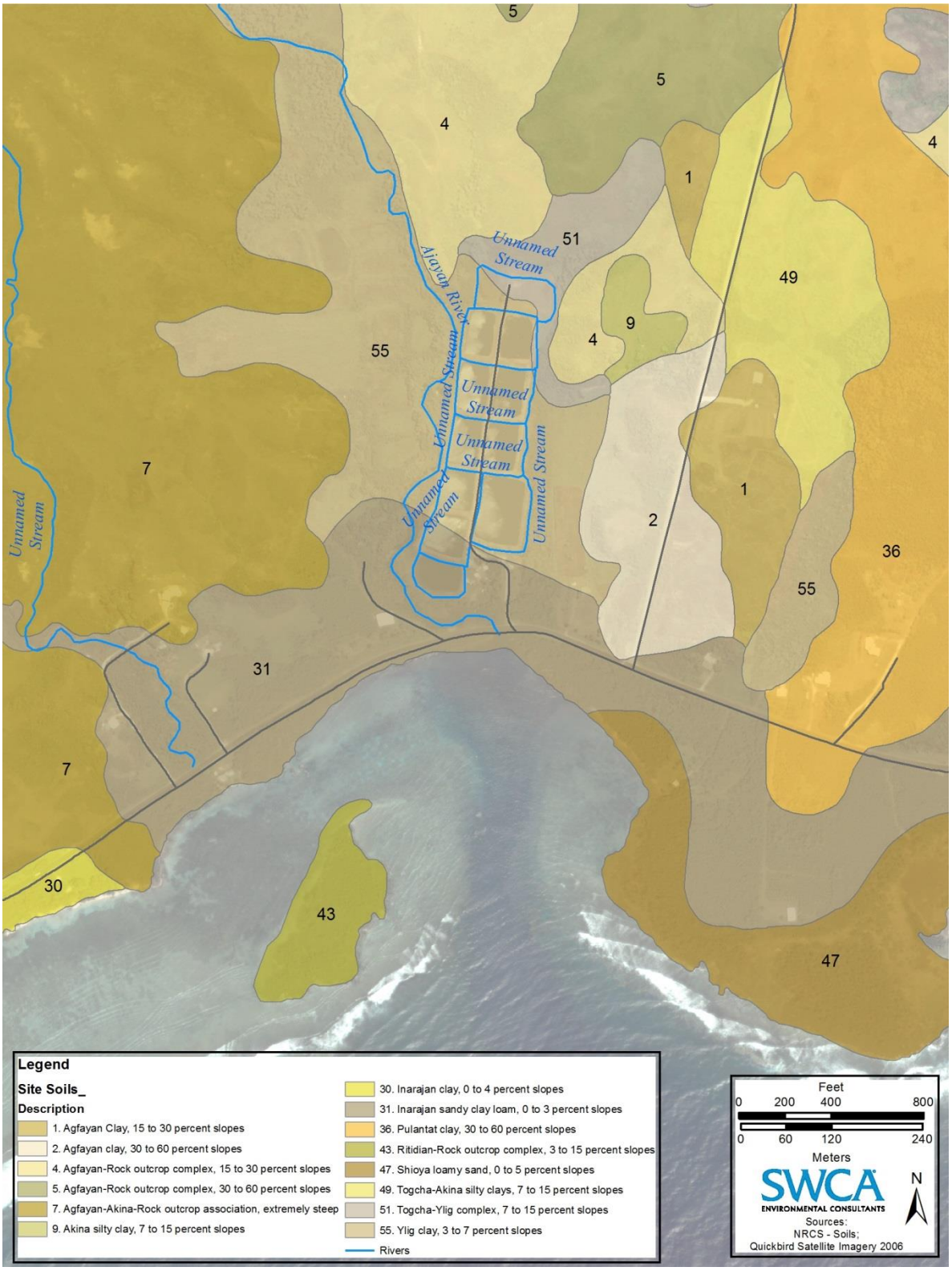
## 2.3 Wetlands

Of the freshwater environments on Guam, freshwater marshes comprise the largest area, encompassing roughly 0.3 percent of the island's surface. These wetland areas can vary in size from 237 ac (96 ha) to less than 1.2 ac (0.5 ha) (GDAWR 2006b). The largest concentration of mangrove on Guam occurs along the eastern shores of Apra Harbor. Although Guam's mangrove wetlands only total about 173 ac (70 ha), they are the most extensive and diverse in the Mariana Islands (Wiles and Ritter 1993). Wetlands on Guam provide habitat for the endangered Mariana common moorhen (*Gallinula chloropus guami*), migratory shorebirds, and many species of native fish and aquatic invertebrates. The mangroves in Apra Harbor serve as nursery habitat for fishes, such as jacks (Carangidae) and barracudas (Sphyraenidae) (Wiles and Ritter 1993).

Substantial wetland losses have historically occurred on Guam from a number of contributing factors, including military activities and developments, road construction, aquaculture, severe soil erosion from fires, pollution, cultivation of crops, and encroachment of the tall reed, *Phragmites karka* (Wiles and Ritter 1993).

SWCA did not perform a wetland determination. No wetlands as designated by the National Wetlands Inventory (NWI) were located on the project area and therefore the project area is not expected to include wetland; however several wetlands are located nearby. While uncommon, Mariana common moorhens have been observed near this area. The area has been designated as habitat of low potential for this species (USFWS 1991, Wiles and Ritter 1993).

Figure 4. Site Soils Characteristics



## 2.4 Vegetation Types

There are nine general terrestrial vegetation types recognized on Guam. They are limestone forest, savannah complex, swamp forest (including mangroves), ravine forest, secondary thickets and partially cultivated scrub forest, coconut plantation, open ground and pastures, urban vegetation, and reed marsh (WERI 2011b). Secondary thicket/scrub forest and savannah (covering 23 and 21 percent of land on Guam, respectively) are the most common vegetation types. Secondary thicket/scrub forest is a degraded, but diverse, habitat type that generally has an open canopy less than 32 ft (10 m) high and a dense understory (GDAWR 2006b). Savannah habitat comprises Guam's grasslands, which are primarily found in southern Guam on graded volcanic soil (Fosberg 1960, GDAWR 2006b).

Forest surrounding the proposed project area consists primarily of secondary thicket/scrub forest with some ravine forest (WERI 2012) (Figure 5).

## 2.5 Terrestrial Flora

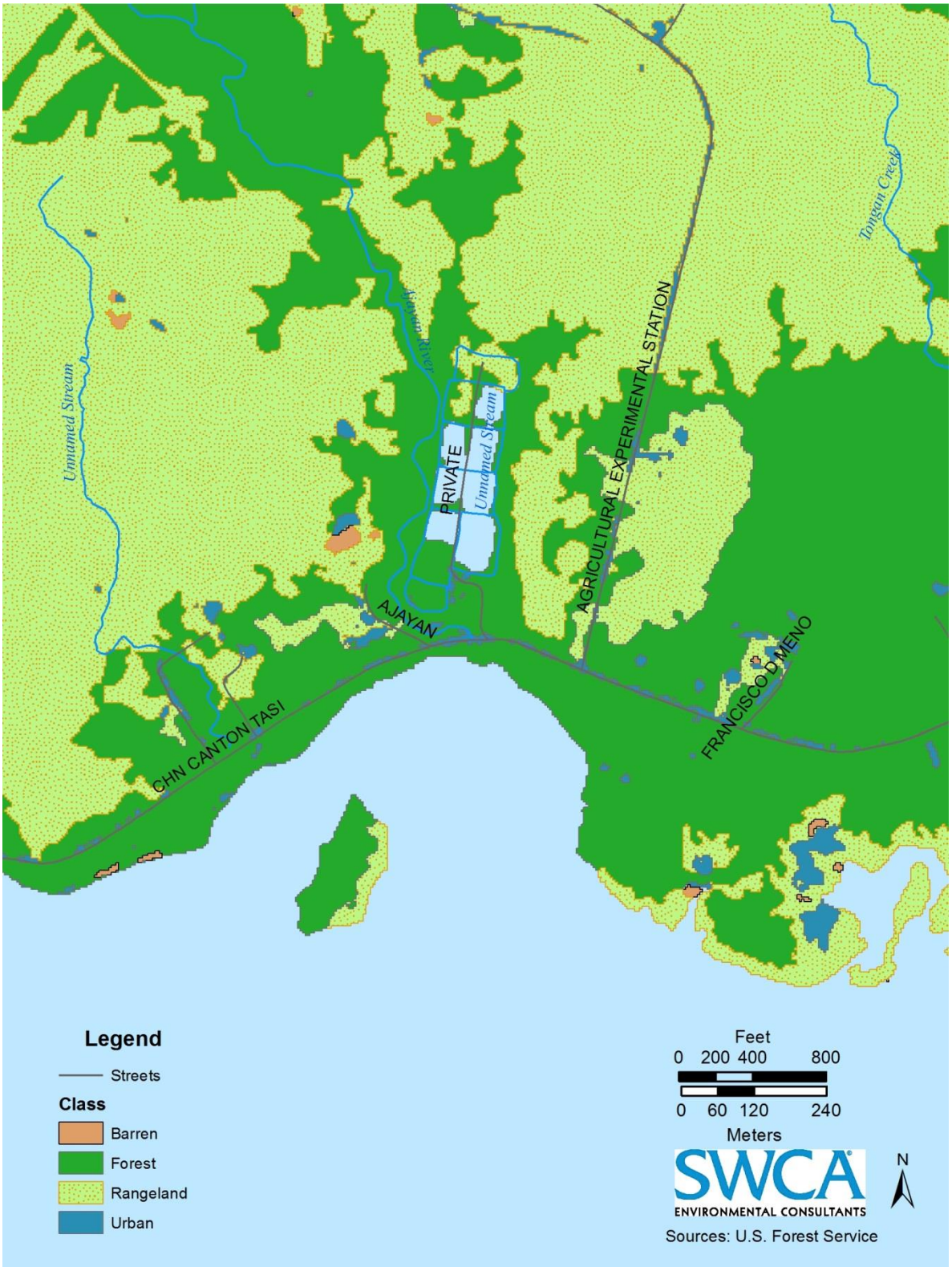
Vegetation is sparse in urban areas on Guam and includes tall grass, weed patches, and shrubby growth that frequently changes in composition (Mueller-Dombois and Fosberg 1998). Secondary thicket/scrub forest habitat immediately abutting the proposed project site likely contains plants such as breadfruit (*Artocarpus altilis*), coconut palm (*Cocos nucifera*), and tangantangan (*Leucaena leucocephala*) (Mueller-Dombois and Fosberg 1998). Because of the bridge's location, ravine forest vegetation, including sea-hibiscus (*Hibiscus tiliaceus*) and kafu (*Pandanus tectorius*), may also be present.

Areas of rangeland occur in the vicinity of the proposed project site. This rangeland likely consists of plants found in the savannah complex. Within the savannah complex, different types of grasses and herbaceous vegetation form a mosaic with erosion scars, shrubs, and tangled ferns. Sword grass (*Miscanthus floridulus*) dominates the landscape, while scattered ironwood (*Casuarina equisetifolia*) trees form sparse woodland (Mueller-Dombois and Fosberg 1998).

Plants found in the emergent and forested or shrub wetland areas will likely be dominated by *Phragmites karka*, but also potentially include sea-hibiscus, kafu, and fish-kill tree (*Barringtonia racemosa*) (Mueller-Dombois and Fosberg 1998).

Guam has one federally endangered plant species, the fire tree (*Serianthes nelsonii*). As only one adult tree of this species, located in the island's north, is known to remain on Guam (GDAWR 2006b), it is unlikely to occur at the proposed project project area. Several plant species are Species of Greatest Conservation Need (SOGCN): the fire tree, *Tabernaemontana rotensis* (endangered), tree fern (*Cyathea lunulata*; endangered), cycad (*Cycas micronesica*), *Heritiera longipetiolata* (endangered), and *Merrilliodendron megacarpum*. These species are not likely to be found at the proposed project area.

Figure 5. Surrounding Forest



## 2.6 Aquatic Flora

### 2.6.1 Shoreline Ecology

The project site is located at the mouth of the Ajayan River as it discharges into Achang Reef Flat. The shoreline vegetation is composed primarily of coconut trees (*Cocos nucifera*), pago (*Hibiscus tiliaceus*), and tangan tangan (*Leucaena leucocephala*).

Although not located within the boundaries of the project site, Nypa palm (*Nypa fruticans*) was identified upstream of the Ajayan River. The species is a wetland obligate and grows in brackish marshes.

### 2.6.2 Aquatic Ecology

The Ajayan River flows south and discharges at the Achang Reef Flat, one of five marine preserves on Guam which regulate fishing and harvesting of marine animals. The reef flat consists of inner and outer reef flats which are exposed at low tide. Mangroves and sea grass beds are present on the shoreline in the vicinity of the project site. The waters of the Achang Reef Flat are classified as M-1 excellent and are suitable for whole body contact, recreation, and to ensure the preservation and protection of marine life including coral, reef-dwelling organisms, fish, and related resources, research, and aesthetic enjoyment.

The surface waters of the Ajayan River are classified as S-3 Low. Waters in this category are used primarily for commercial, agriculture, or industrial activity. Aesthetic enjoyment is limited andrecreational body contact is limited. Maintenance of aquatic life is also limited.

## 2.7 Fauna

Fauna on the proposed project site may include birds, mammals, reptiles and amphibians, and terrestrial invertebrates.

### 2.7.1 Birds

Birds most likely to occur in the vicinity of the proposed project site include the native yellow bittern (*Ixobrychus sinensis*), and introduced Eurasian tree sparrow (*Passer montanus*), black drongo (*Dicrurus macrocercus*), black francolin (*Francolinus francolinus*), and island collared-dove (*Streptopelia bitorquata*). Importantly, the federally and locally endangered Mariana common moorhen has been observed in the vicinity of the proposed project site, although sightings are uncommon.

Mariana common moorhens reside in both permanent and seasonal freshwater wetlands. Wetlands with open water along with equal amounts of emergent, submergent, and floating vegetation are suitable for moorhen presence and activity. The Mariana common moorhen nests throughout the year and typically lays eggs concealed in emergent vegetation near open water (USFWS 1991, 2010). Moorhens move from seasonal to permanent wetlands during the dry season, and subsequently move back to seasonal wetlands during the wet

season (USFWS 2010). During these periods, interisland movements occasionally occur (Worthington 1998, Takano and Haig 2004a, b).

Two additional federally endangered birds still extant on Guam, Mariana crow (*Corvus kubaryi*) and Mariana swiftlet (*Aerodramus bartschi*), are not likely to occur on the proposed project site. The Mariana crow population has been reduced to one individual on Andersen Air Force Base (AAFB), and the Mariana swiftlet population is restricted to three caves on the Naval Magazine (Grimm 2008, SWCA 2011b, USFWS 2011a). The locally endangered Micronesian starling (*Aplonis opaca guami*) is also still found on Guam, but persists in small numbers on AAFB, Mount Santa Rosa, and Cocos Island (GDAWR 2006b, SWCA 2011b).

### 2.7.2 Mammals

All non-flying mammals on Guam are introduced species (Vogt and Williams 2004). Small mammals are most likely to inhabit the proposed project area. These include rats (*Rattus* spp.), house mice (*Mus musculus*), and the house shrew (*Suncus murinus*) (Wiewel et al. 2009). Other introduced mammals on Guam include feral cats (*Felis catus*), feral dogs (*Canis familiaris*), Philippine deer (*Cervus mariannus*), feral pigs (*Sus scrofa*), and feral water buffalo (*Bubalus bubalis*).

The federally threatened Mariana fruit bat (*Pteropus mariannus mariannus*) is typically associated with a number of forest types, including primary and secondary limestone forest, *Cocos nucifera* forest, *Casuarina equisetifolia* groves, and ravine forest (Wiles et al. 1989, Johnson 2001). Tree species known to be used for roosting include *Aglaia mariannensis, Barringtonia asiatica, Casuarina equisetifolia*, *Cestrum diurnum*, *Cocos nucifera*, *Cordia subcordata, Elaeocarpus joga, Erythrina variegata, Ficus prolixa, Intsia bijuga, Macaranga thompsonii, Mammea odorata, Neisosperma oppositifolia, Ochrosia mariannensis, Premna obtusifolia, Pisonia grandis,* and *Terminalia catappa* (Johnson 2001, Janeke 2006, SWCA 2008a, b, 2011b). Presently the Mariana fruit bat persists in small numbers on Guam, primarily in the northern region of the island (SWCA 2008b, USFWS 2009a, SWCA 2011b). The Mariana fruit bat, also a locally endangered SOGCN, is not likely to use habitat on the proposed project site.

### 2.7.3 Reptiles and Amphibians

Lizards classified in the families commonly known as skinks and geckos may be found at the proposed project area. Skinks most likely to be observed are the native blue-tailed skink (*Emoia caeruleocauda*) and introduced curious skink (*Carlia ailanpalai*). The curious skink is common in many habitats on Guam and the blue-tailed skink, in most areas where it occurs, is the most visible lizard on the forest floor (USGS 2005). Potential gecko species at the site are the mourning gecko (*Lepidodactylus lugubris*), mutilating gecko (*Gehyra mutilata*), and house gecko (*Hemidactylus frenatus*). These gecko species are found in all major habitat types on Guam; the mourning gecko and house gecko in particular can be found in areas of human disturbance (Sabath 1981). The monitor lizard (*Varanus indicus*), known to have a wide distribution on Guam (USGS 2005), may potentially use habitat on the proposed project site.

Guam has seven locally endangered reptiles: the snake-eyed skink (*Cryptoblepharus poecilopleurus*), Pacific slender-toed gecko (*Nactus pelagicus*), tide-pool skink (*Emoia atrocostata*), Slevin's skink (*Emoia slevini* [also known as the Mariana skink]), azure-tailed skink (*Emoia cyanura*), moth skink (*Lipinia noctua*), and Micronesian gecko (*Perochirus ateles*) (GDAWR 2006a). The snake-eyed skink, Slevin's skink, azure-tailed skink, and Micronesian gecko are not known to persist on Guam (Vogt and Williams 2004, USGS 2005, GDAWR 2006b).

The invasive brown treesnake (*Boiga irregularis*) may occur within proposed project area. The brown treesnake arrived on Guam after World War II and is responsible for the extirpation and extinction of Guam's native forest birds (Rodda and Savidge 2007). Brown treesnakes are known to habitually travel through all types of forested and nonforested habitats on Guam (Rodda et al. 1999).

Two introduced species of turtle have breeding populations on Guam: the soft-shell turtle (*Pelodiscus sinensis*) and red-eared slider (*Trachemys scripta elegans*) (Wiles and Ritter 1993, Leberer 2003). Of these, the red-eared slider is most likely to be present on the proposed project site, as its breeding populations occur throughout southern Guam (Leberer 2003).

Four sea turtles species occur in the coastal waters surrounding Guam. The green sea turtle (*Chelonia mydas*) and Loggerhead Sea turtle (*Caretta caretta*) are federally and locally listed as threatened, and Hawksbill sea turtle (*Eretmochelys imbricate*) and Leatherback sea turtles (*Dermochelys coriacea*) are federally and locally listed as endangered. Turtle nesting areas have been identified at Ritidian National Wildlife Refuge, Haputo, Urunao, Tumon Bay, Cabras Island, the waterfront annex of Naval Base Guam, Spanish Steps, Cocos Island, Acho Bay, Nomña Bay, Jinapsan, and Tarague Beach (NOAA 2010). Acho Bay is located near the project site. Turtle nesting areas are not present on the project area; however, sea turtles have been observed foraging in the vicinity of the project area (GDAWR).

Due to its remote status as a Pacific island, Guam has no native amphibian species. However, eight introduced amphibians are found on Guam. These include the marine toad (*Rhinella marina*; established in 1937) and the eastern dwarf treefrog (*Litoria fallax*; established in 1938), as well as the more recently established greenhouse frog (*Eleutherodactylus planirostris*), Hong Kong whipping frog (*Polypedates megacephalus*), and Gunther's Amoy Frog (*Hylarana [Sylvirana] guentheri*; locally known as the barking frog) (Christy et al. 2007). The following species, as of 2007, were of questionable status: the crab-eating frog (*Fejervarya cancrivora*), Indian rice frog (*Fejervarya limnocharis*), and the marbled pigmy frog (*Microhyla pulchra*) (Christy et al. 2007).

### 2.7.5 Invertebrates

2.6.5.1 Terrestrial Invertebrates

Two species of butterfly are locally listed as SOGCN: the Mariana eight spot butterfly (*Hypolimnas octocula mariannensis* [also known as the forest flicker]) and the Mariana wandering butterfly (*Vagrans egistina* [also known as the Marianas rusty]). Both butterflies are federal candidate species for listing under the U.S. Endangered Species Act (USFWS 2011b, c). The Mariana eight spot and Mariana wandering butterflies inhabit primarily limestone forest, where their host plants *Elatostema calcareum*, *Procris pedunculata* and *Maytenus thompsonii* occur (Schreiner and Nafus 1997, GDAWR 2006b). These butterflies are not likely to be found at the proposed project area.

There are three species of partulid tree snails that are locally protected: one that is threatened, the Guam tree snail (*Partula radiolata*), and two endangered, the humped tree snail (*Partula gibba*) and fragile tree snail (*Samoana fragilis*) (GDAWR 2006a). All three partulids are federal candidate species for listing under the U.S. Endangered Species Act (USFWS 2012b, c, d). Most likely to be found on the proposed project site is the Guam tree snail, which was once thought to be common along stream courses in southern Guam (Hopper and Smith 1992). This species was the only partulid found during a 2008 survey on the Naval Magazine (Smith et al. 2008). The only recently reported populations of humped tree snail and fragile tree snail are from northern regions of the island (Smith et al. 2008, SWCA 2011a). All Guam's partulid tree snails are considered in decline (GDAWR 2006b).

# 3.0 METHODS AND RESULTS

## 3.1 Flora Surveys

### 3.1.1 Terrestrial Flora

*Visual surveys*
Identifiable terrestrial flora was recorded in the survey area. Visual surveys focused on locally and federally listed. Each listed plant species encountered was marked with flagging tape and location recorded with a Trimble® GeoExplorer® 2008 Series Global Positioning System (GPS) unit.

*Results*
A total of 19 plants were identified to either genera or species on 6 and 7 November 2013 (Table 1). The 7 native plants documented consisted of five trees (*Hibiscus tiliaceus, Pandanus tectorius, Bougainvillea glabra, Callicarpa candicans* and *Morinda citrifolia*), one fern (*Polypodium scolopendria),* and one grass (*Saccharum spontaneum*). No listed plant species were located on the proposed project site or immediate vicinity.

Nypa palm was identified upstream on the banks of the Ajayan River, however, it was not observed within the boundaries of the project site.

Table 1. Plant species identified during visual surveys at and immediately adjacent to the proposed Ajayan Bridge replacement project area, Guam: November 2013. Plant names are arranged alphabetically by family and then by species. The taxonomy, nomenclature, and biogeographic status of the plants are in accordance with Stone (1970), Moore and Krizman (1981), Stemmermann (1981), Falanruw et al. (1990) Raulerson and Rinehart (1991, 1992), McConnell and Gutierrez (2006), N = native to the Mariana Islands; I = introduced or alien (all plants brought to the Mariana Islands by humans, intentionally or accidentally); NA = not applicable; NCN = no common name.

| Family and Scientific Name | Common Name | Biogeographic Status |
|---|---|---|
| ARECACEAE | | |
| *Areca catechu* | pugua | I |
| *Cocos nucifera* | coconut palm | I |
| ASTERACEAE | | |
| *Bidens alba* | beggar's tick | I |
| *Chromolaena odorata* | Siam weed | I |
| *Mikania scandens* | mile-a-minute vine | I |
| CALOPHYLLACEAE | | |
| *Calophyllum inophyllum* | daok | I |

| Family and Scientific Name | Common Name | Biogeographic Status |
|---|---|---|
| CARICACEAE | | |
| *Carica papaya* | papaya | I |
| FABACEAE–MIMOSIOIDEAE | | |
| *Leucaena leucocephala* | tangantangan | I |
| *Pithecellobium dulce* | kamachile | I |
| LAMIACEAE | | |
| *Callicarpa candicans* | Malayan lilac | N |
| MALVACEAE | | |
| *Hibiscus tiliaceus* | sea-hibiscus | N |
| MUSACEAE | | |
| *Musa* sp. | NA | NA |
| NYCTAGINACEAE | | |
| *Bougainvillea glabra* | bougainvillea | N |
| PANDANACEAE | | |
| *Pandanus tectorius* | kafu | N |
| POACEAE | | |
| *Bambusa* sp. | NA | I |
| *Saccharum spontaneum* | wild cane | N |
| POLYPODIACEAE | | |
| *Polypodium scolopendria* | monarch fern | N |
| RUBIACEAE | | |
| *Morinda citrifolia* | Indian mulberry | N |

## 3.2 Fauna Surveys

### 3.2.1 Terrestrial Fauna

3.2.1.1 Birds

*Mariana common moorhen surveys*
Visual and audio survey for Mariana common moorhens were conducted along the Ajayan River and an adjacent tributary. Surveys were located in riparian vegetation communities, primarily composed of *Hibiscus tiliaceus*. Surveys were conducted between 0600 h and 1000 h and the observer monitored the region for moorhen movements, vocalizations, and observations. At each station, the observer recorded the number of individuals of each bird species observed or heard.

*Results*
On 6 and 7 November 2013, 2 Mariana common moorhen surveys were completed at four locations on the survey area and immediate vicinity. No Mariana common moorhens were detected during any of the surveys; however, the introduced island collared-dove (*Streptopelia bitorquata*), white tern (*Gygis alba*) and Eurasian tree sparrow (*Passer montanus*) were heard or observed.

*Mariana swiftlet surveys*
Station count surveys were carried out at four locations to determine the presence of Mariana swiftlets in the survey area and immediate vicinity. The survey location was chosen as a vantage point that provided wide and unimpeded views of the survey area. Bushnell® Legend 10 x 42 binoculars were used to detect and count swiftlets at the survey station. All Mariana swiftlet detections were documented using the Trimble® GPS unit. Wind speed, cloud cover, and rainfall (presence/absence) were recorded at the commencement of each survey period and hourly thereafter.

*Results*
Two station count surveys for Mariana swiftlets were completed, one each on 6 and 7 November 2013. No Mariana swiftlets were detected during any of the surveys.

3.2.1.2 Mammals

*Mariana fruit bat surveys*
Station count surveys (or solitary fruit bat counts) as described in USFWS (2009b) and Utzurrum et al. (2003) were conducted to determine the presence of solitary Mariana fruit bats, locate aggregations or colonies, and assess flight paths. These surveys were carried out at four locations in the survey area which were chosen as a vantage point that provided wide and unimpeded views of the survey area. As suggested in USFWS (2009b), we standardized morning counts to commence pre-dawn and continue for about two hours after full light. The Bushnell® binoculars and a Bushnell® Elite 20-60x zoom spotting scope mounted on a Manfrotto™ tripod were used to detect and count fruit bats. Wind speed,

cloud cover, and rainfall (presence/absence) were recorded at the commencement of each survey period and hourly thereafter.

*Results*
Two station count surveys for Mariana fruit bats were completed, one each on 6 and 7 November 2013. No Mariana fruit bats were detected during any of the surveys.

Feral dogs (*Canis familiaris*) were recorded in the survey area. Adult dogs were observed and heard on and adjacent to the proposed project site. Additionally, skeletal remains of two feral pigs (*Sus scrofa*) were found in the survey area.

3.2.1.3 Reptiles and Amphibians

Herpetological surveys were performed nocturnally (targeting geckos) and diurnally (targeting skinks) to increase the possibility of encountering as many species as possible. Reptiles and amphibians (herpetofauna) were detected by capture using glue board traps (henceforth referred to as traps) and/or visual surveys. Capturing individuals was valuable for identification of fast moving, cryptic or morphologically similar species. Visual surveys were intended to detect species that might not be trapped.

*Trap surveys*
Fieldwork sessions commenced between 0700 h and 0900 h. Throughout the site, non-scented traps were set randomly on trunks of trees and the ground at each trap location. Trap location intervals were no more than 33 ft (10 m) apart, and if no tree was present within 15 ft (5 m) of a ground trap, only the ground trap was set. Tree traps were nailed to a tree or plant with a minimum diameter at breast height of 1.5 in (50 mm) between 3 and 6 ft (1–2 m) above the ground. A total of 30 survey stations (55 traps) were established. All stations consisted of one tree trap and one ground trap except stations 1.1, 1.3, 1.4, and 1.5, which had only a ground trap. All traps were set in the shade. Traps were checked two hours from opening.

*Visual surveys*
Visual surveys were conducted on 6 and 7 November 2013. Search speed was approximately 0.2 mi/h (0.3 km/hr). Species, location, time and weather conditions were recorded. Incidental observations and comments were also recorded.

*Results*
Herpetofauna was surveyed on 6 and 7 November 2013. The surveys were conducted in the vicinity where site clearing and construction will occur. A total of 17 herpetofauna individuals representing two species were detected at the site (Table 2). These included the curious skink (*Carlia fusca)* and the cane toad *(Rhinella marinus),* both are introduced species.

Table 2. Vertebrate species identified during visual surveys at and immediately adjacent to the proposed Ajayan Bridge replacement project area, Guam: November 2013, N = native to the Mariana Islands; I = introduced or alien (all plants brought to the Mariana Islands by humans, intentionally or accidentally)

| Scientific Name | Common Name | Biogeographic Status |
|---|---|---|
| **Avian** | | |
| *Passer montanus* | Eurasian Tree Sparrow | I |
| *Gypis alba* | White Tern | N |
| *Streptopelia bitorquata* | Island Collared Dove | I |
| *Dicrurus macrocerus* | Black Drongo | I |
| **Reptiles** | | |
| *Carlia fusca* | Curious skink | I |
| *Rhinella marinus* | Marine toad | I |
| **Mammals** | | |
| *Sus scrofa* | Feral Pigs | I |
| *Canis familiaris* | Feral Dogs | I |

3.2.1.4 Invertebrates

*Mariana eight-spot butterfly and Mariana wandering butterfly surveys*
During terrestrial flora surveys (see section 3.1.1), known Mariana eight-spot and Mariana wandering butterfly host plants (*Elatostema calcareum*, *Procris pedunculata* and *Maytenus thompsonii*) in the survey area and immediate vicinity were searched. If any known host plants were located, visual surveys were conducted for eggs, larvae, chrysalids, and adults of both butterfly species.

*Results*
Visual surveys on 6 and 7 November 2013 did not document known Mariana eight-spot and Mariana wandering butterfly host plants. Additionally, no adults of either species were observed. Two butterfly species were detected in the survey area: the native blue-banded king crow (*Euploea eunice*) and introduced black citrus swallowtail (*Papilio polytes*).

*Partulid tree snail surveys*
General visual surveys for partulid tree snails were conducted on the proposed project site and immediate vicinity. Target species included the Guam tree snail (*Partula radiolata*), humped tree snail (*Partula gibba*), and fragile tree snail (*Samoana fragilis*). During the surveys, the observer examined the leaves and stems of known partulid host plants for the presence of snails. Information on known partulid host plant species was obtained from Hopper and Smith (1992), Smith et al. (2008), and SWCA (2011a).

*Results*
No partulid tree snails were recorded suring the surveys on 6 and 7 November, 2013.

Table 3. Invertebrate species identified during visual surveys at and immediately adjacent to the proposed Ajayan Bridge replacement project area, Guam: November 2013, N = native to the Mariana Islands; I = introduced or alien (all plants brought to the Mariana Islands by humans, intentionally or accidentally)

| Scientific Name | Common Name | Status |
|---|---|---|
| **Butterflies** | | |
| *Euploea Eunice* | Blue-banded King Crow | Native |
| *Papilio polytes* | Black Citrus Swallowtail | Introduced |

# 4.0 CONCLUSIONS

## 4.1 Flora

### 4.1.1 Terrestrial Flora

4.1.1.1 Federal and Locally Listed Species

No federally or locally threatened or endangered terrestrial flora species were found on the proposed Ajayan Bridge project site.

4.1.1.2 Invasive Species

Three terrestrial flora species recorded on the proposed Guatali Bridge project site are considered to be invasive by the International Union for Conservation of Nature/Species Survival Commission (IUCN/SSC) Invasive Species Specialist Group: *Chromolaena odorata, Leucaena leucocephala,* and *Mikania scandens,* (IUCN/SSC - ISSG 2005, 2006, 2010a, b). General impacts of these species include preventing reproduction and establishment of other plant species (*C. odorata*); killing other plants by eliminating light and smothering them (*M. scandens*); and replacing native forest with dense monospecific thickets (*L. leucocephala*).

## 4.2 FAUNA

### 4.2.1 Terrestrial Fauna

4.2.1.1 Federal and Locally Listed Species

*Birds*
No federally or locally threatened or endangered bird species were found on the proposed Ajayan Bridge project site. However, because the region contains suitable Mariana common moorhen habitat, we do not dismiss the possibility of moorhens using the area for foraging, nesting, and resting.

*Mammals*
No federally or locally threatened or endangered mammal species were found on the proposed Ajayan Bridge project site. The Mariana fruit bat survey methods employed during this project rely on observing fruit bats in low light and daytime conditions. Any fruit bats that were using areas prior to, or after, the survey periods would not have been detected. The results from each survey represent a relatively small temporal and spatial snapshot.

*Reptiles and Amphibians*
No federal or locally threatened or endangered reptile or amphibian species were observed on the proposed Ajayan Bridge project site.

Known sea turtle nesting areas are located near the project site and sea turtles have been observed foraging in the vicinity of the Ajayan Bridge.

*Invertebrates*
No federal or locally threatened or endangered invertebrate species were observed on the proposed Ajayan Bridge project site.

#### 4.2.1.2 Invasive Species

*Birds*
The black drongo was detected during bird surveys on the proposed Ajayan Bridge project site. This bird was introduced by the Japanese to Rota from Taiwan in 1935 (Baker 1951) and is presumed to have colonized Guam on its own (Jenkins 1983). It is considered to be strongly territorial and aggressive, and known to displace smaller birds that might otherwise nest within their territories (Fritts and Rodda 1998). Although not technically invasive, the black drongo is regarded as a factor in population declines of the federally endangered Rota white-eye (*Zosterops rotensis*) and Mariana crow on Rota (USFWS 2005, 2007).

*Mammals*
No invasive mammal species were found on the proposed Ajayan Bridge project site; however, skeletal remains of two feral pigs were discovered on the site.

*Reptiles and Amphibians*
The curious skink and marine toad are both prolific introduced species observed during the herpetological survey.

*Invertebrates*
No invasive invertebrate species were found on the proposed Ajayan Bridge project site.

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# Appendix L
# Ajayan Bay Archeological Site 66-05-0111

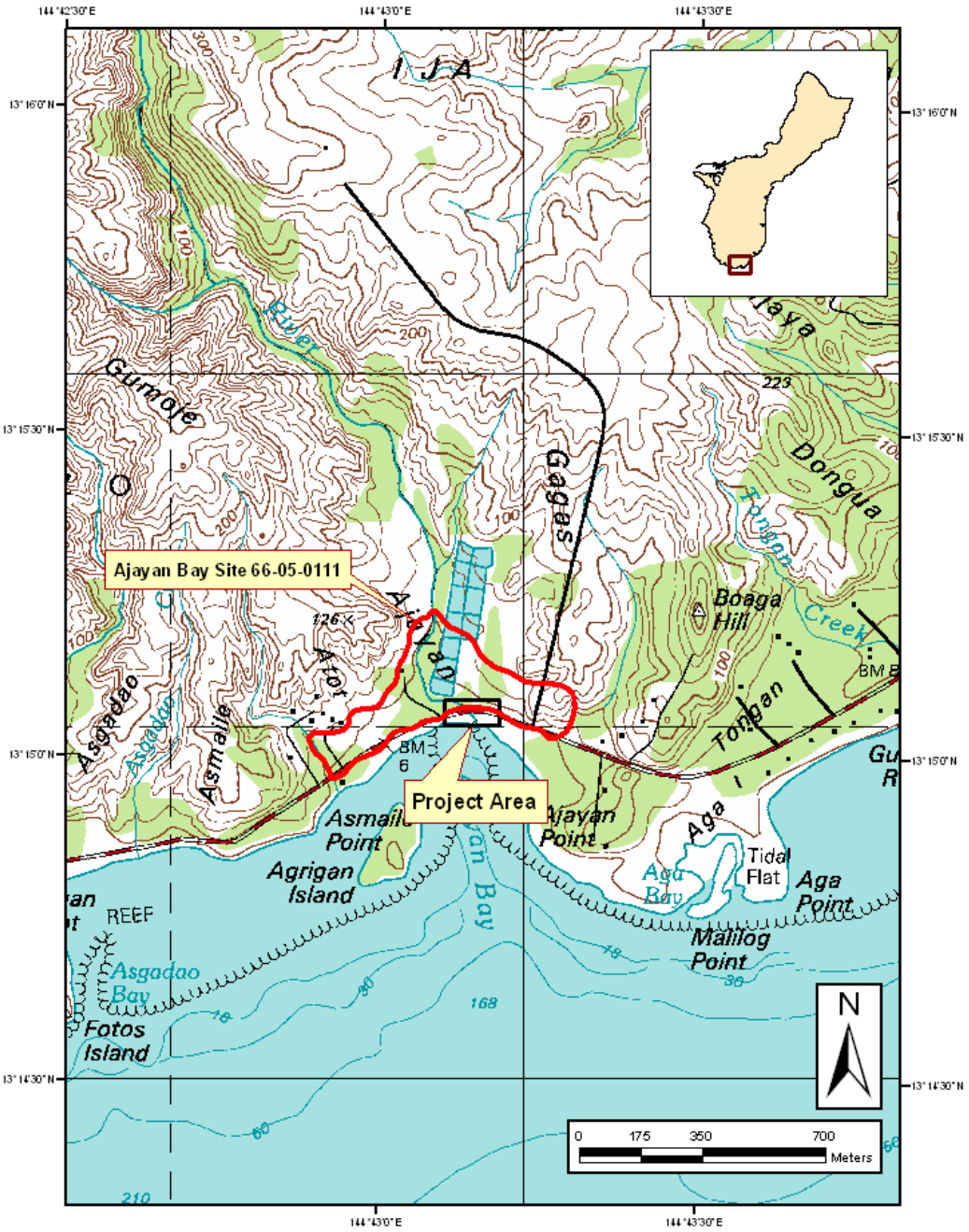


Figure 5. Location of archaeological sites in the vicinity of the current APE on a portion of USGS 2000 map, Inarajan Quadrangle (1:24,000).