FINAL

ENVIRONMENTAL ASSESSMENT

for

NAVY-COMMERCIAL TIE-IN HARDENING (MILCON P-661)

JOINT REGION MARIANAS, GUAM

February 2022

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DEPARTMENT OF DEFENSE
DEPARTMENT OF THE NAVY

FINDING OF NO SIGNIFICANT IMPACT FOR THE NAVY-COMMERCIAL TIE-IN HARDENING (MILCON P-661), JOINT REGION MARIANAS, GUAM

Pursuant to the Council on Environmental Quality regulations (40 Code of Federal Regulations [CFR] Parts 1500-1508) implementing the National Environmental Policy Act (NEPA) and Department of the Navy (Navy) NEPA regulations (32 CRF Part 775), the Navy gives notice that an Environmental Assessment (EA) has been prepared and an Environmental Impact Statement (EIS) is not required for the Navy-Commercial Tie-In Hardening (MILCON P-661) in the vicinity of Apra Harbor, Guam. This action will be implemented as set out in Alternative 1 (Preferred Alternative).

Proposed Action: The United States (U.S.) Navy, Naval Base Guam (NGB) proposes to replace an existing Navy/Commercial petroleum, oil, and lubricant (POL) tie-in, with a new, hardened tie-in facility. The new facility would be located to the southeast of the existing facility within the pipeline easement causeway between Highway 18 and Highway 1, in the vicinity of Apra Harbor, Guam. The Proposed Action (MILCON P-661) would include hardening the new facility with reinforced concrete roof slabs and walls supported on concrete piles. Once completed, the new hardened facility will replace the existing tie-in facility. Exposed piping at the existing facility will be capped and buried or removed. Site improvements and utility infrastructure would be constructed to support and protect the new facility. Project implementation is anticipated to begin in 2022.

Purpose and Need: The purpose of the Proposed Action is to protect the safe and adequate distribution of POL commodities for Navy and commercial uses. The Navy/Commercial Tie-In serves as an alternate fuel supply source between the Navy and commercial systems. The Proposed Action is needed to minimize the risk of damage to Navy infrastructure and to assure the capability of distributing and dispensing fuel during a contingency. The Expeditionary Warfare Center (EXWC) has provided minimum design requirements for the hardening of POL lines and supporting facilities against potential threats.

Alternatives Analyzed: Alternatives were developed for analysis based upon the following reasonable alternative screening factors: minimizes visibility of the tie-in infrastructure; maximizes the resilience of the tie-in infrastructure; minimizes impacts to wetlands; compatibility with Anti-Terrorism Force Protection (ATFP) features and regulations; and compliance with regional guidance.

Based on the reasonable alternative screening factors and meeting the purpose and need for the Proposed Action, the No Action Alternative and two action alternatives were carried forward for detailed analysis in the EA.

No Action Alternative: Under the No Action Alternative, the Proposed Action would not be undertaken. The infrastructure at the Navy/Commercial Tie-In facility would not be changed to make it less susceptible to damage. The project would not provide ATFP features and would not comply with ATFP regulations and physical security mitigation in accordance with the Department of Defense (DoD) Minimum Anti-Terrorism Standards for Buildings. The No Action Alternative would not meet the purpose and need for the Proposed Action; however, as required by the National Environmental Protection Act (NEPA), the No Action Alternative is carried forward for analysis. The No Action Alternative will be used to analyze the consequences of not undertaking the Proposed Action and will serve to establish a comparative baseline for analysis.

Alternative 1 (Preferred Alternative): Under Alternative 1, the Navy proposes to construct a hardened shelter over and around a new Navy-Commercial Tie-In facility. Alternative 1 would include hardening the facility with reinforced concrete roof slabs and walls supported on concrete piles. Openings for the facility would consist of a system of hardened doors and louvers. The new tie-in facility would be located along the pipeline easement causeway southeast of the existing tie-in facility. The new hardened tie-in facility would replace the Navy-owned tie-in manifolds at the existing tie-in facility. Once the new hardened tie-in facility is completed, the concrete walls

of the existing Navy tie-in facility would be removed, and the existing valves would be replaced with straight pipe and then buried. Alternative 1 would increase the resilience of the Navy/Commercial tie-in, and has been designed in accordance with EXWC minimum design requirements for the hardening of POL lines and supporting facilities. Additional improvements would include a new seismic isolation valve, a 20-foot-wide paved access road, new fencing and security gates at both entrances to the causeway, and utility infrastructure serving the new hardened tie-in facility.

Alternative 2: Under Alternative 2, the Navy proposes to construct a hardened tie-in at another location along the pipeline easement causeway closer to Highway 1. The Preferred Alternative would provide a necessary standoff distance from the proposed hardened tie-in facility to Highway 18. Alternative 2 would instead locate the proposed hardened tie-in facility a necessary distance from Highway 1 (southeast along the causeway from the new hardened tie-in facility proposed in the Preferred Alternative). The construction methodology would be the same as with the Preferred Alternative. Site improvements would be similar to the Preferred Alternative, except that the specific site improvements associated with the location of the hardened tie-in facility (i.e., routing the access road to the south of the tie-in facility and the associated grouted rip rap embankment) would be located further southeast along the causeway. Utility infrastructure would be similar to the Preferred Alternative except that Alternative 2 would require a longer extension of the proposed new water line because the location of the new hardened tie-in facility would be further from the water service point of connection.

Alternatives Considered but Dismissed from Further Consideration: The following alternatives were considered, but not carried forward for detailed analysis in this EA because they do not meet the purpose and need for the project and satisfy the reasonable alternative screening factors:

- Relocate Pipelines and Construct a New Hardened Tie-In Facility
- Construct a Hardened Tie-In Structure in Place of the Existing Tie-In
- Construct a New Unhardened Tie-In Facility

Environmental Effects: No significant direct, indirect, or cumulative environmental impact would occur from implementing the proposed action. Because potential impacts were considered negligible or nonexistent, the following resources were not evaluated in detail in this EA: geological resources, airspace, land use, noise, visual resources, transportation, public health and safety, socioeconomics, and environmental justice.

Potential environmental impacts on biological resources, water resources, air quality, cultural resources, infrastructure, and hazardous materials and wastes are summarized here.

Biological Resources: The Preferred Alternative would result in less than significant impacts to biological resources.

Vegetation. The Preferred Alternative would result in less than significant impacts to vegetation. Construction of the proposed improvements would include the clearing of vegetation on and adjacent to the existing POL causeway. However, this would have a less than significant impact because it represents only a small fraction of the wetland area in Sasa Bay, cleared vegetation would be a mix of common native and non-native ruderal species, and there are no plant species of any conservation concern in the vicinity of the proposed project's construction footprint.

Wildlife. The Preferred Alternative would result in less than significant impacts to wildlife. The noise and activity associated with construction of the Preferred Alternative would temporarily displace wildlife from the project area and adjacent areas. Additionally, the clearing of wetland vegetation and placement of fill material into wetland areas would preclude wildlife from residing within the new building's constructed extents. However, wildlife species are expected to use suitable nearby habitat for foraging, sheltering, and breeding. Displacement of these individuals from the project footprint and adjacent areas is not expected to affect the survival of individuals or populations. In the long-term, the use and function of habitat surrounding the POL causeway and the relocated Navy-Commercial tie-in would be similar to current baseline conditions. Significant impacts to wildlife populations are not expected as a result.

Threatened and Endangered Species. The Preferred Alternative would result in less than significant impacts to threatened and endangered species. The only currently listed or proposed for listing species recorded within or adjacent to the survey sites is the endangered Mariana Common Moorhen (*Gallinula chloropus guami*). Because moorhens have been observed in areas adjacent to the work site: 1) construction work will be halted or postponed should moorhen ingress into the project area during the construction phase; 2) construction workers will be instructed not to harm or harass the species; 3) work will be halted if the bird is present within a 100 feet radius of the worksite; 4) a barrier to oil spills and a fence will be installed to deter birds from entering the work site; and 5) further cooperation with USFWS on specific spill mitigation and prevention methods will be done to minimize impacts. Implementation of these avoidance and minimization measures would ensure that impacts to the species are discountable. Accordingly, the Navy determined that the Preferred Alternative may affect, but is not likely to adversely affect (NLAA) the Mariana Common Moorhen with the implementation of avoidance/minimization measures pursuant to section 7 of the Endangered Species Act of 1973 [16 U.S.C. 1531-1544 et seq.] in a letter to the USFWS dated September 17, 2020. The USFWS concurred with the Navy's NLAA determination in a return letter dated November 19, 2020 (see Appendix A of the EA).

Migratory Bird Treaty Act (MBTA) species. The Preferred Alternative would result in less than significant impacts to MBTA species. Three migratory bird species that are protected under the MBTA were recorded during the biological survey (AECOS, 2019): the Pacific Golden-Plover (*Pluvialis fulva*), the Asiatic subspecies of Whimbrel (*Numenius phaeopus variegatus*), and Common Tern (*Sterna hirundo*). All three of these species could potentially loaf or forage within the proposed construction footprint. However, as none of these species presently nest on Guam, disturbance from construction and operation activities would not incur significant negative impacts on MBTA-protected species.

Water Resources: The Preferred Alternative would result in less than significant impacts to water resources. The vast majority of ground disturbance and construction activities would take place on the man-made POL causeway, but there would be approximately 3,200 square feet (0.07 acres) of permanent wetland loss associated with construction of the Preferred Alternative. Due to the remote potential for POL spills, conservation measures will be implemented to preserve the physical, chemical, and biological integrity of wetland waters of the United States. The proposed improvements would be designed based on the principles of low impact development (LID) and would not increase stormwater runoff from the project site into adjacent areas including the marine environment. Erosion control BMPs would be implemented, and conditions of the National Pollutant Discharge Elimination System (NPDES) and Clean Water Act (CWA) permits would be complied with to avoid and minimize the potential for construction related sediments and/or pollutants being transported into receiving wetlands and marine waters. The Preferred Alternative is located in the floodplain, but there are no practicable alternatives to relocate it outside of the floodplain, and it would not result in adverse direct or indirect effects to the floodplain.

The entire island of Guam has been designated a "coastal zone" under the Federal Coastal Zone Management Act (CZMA) of 1972. The CZMA requires that all construction and operational activities be consistent, to the maximum extent practicable, with the Guam Coastal Management Program (GCMP) policies to guide the use, protection, and development of land and ocean resources within Guam's coastal zone (Guam Bureau of Statistics and Plans [GBSP], 2011). In accordance with the CZMA, the Navy determined that the Preferred Alternative is consistent to the maximum extent practicable with the federally approved enforceable policies of the GCMP. The Navy submitted a Consistency Determination on the Preferred Alternative to GBSP requesting their review and concurrence. The Navy received GBSP's conditional concurrence on this determination via correspondence dated November 8, 2021 (see Appendix B of the EA).

Air Quality: The Preferred Alternative would result in less than significant impacts to air quality. Short-term, temporarily-emitted air emissions (e.g., fugitive dust, combustion of fossil fuels) would be generated during the construction period. BMPs would be implemented to minimize fugitive dust during construction. The Preferred Alternative would upgrade the existing dirt access road to a paved road which is expected to reduce dust emissions from vehicle access. Therefore, an improvement in air quality is expected during the operational period. The project

is located in a nonattainment area for sulfur dioxide (SO2). Total construction SO2 emissions would be below de minimis thresholds for Clean Air Act (CAA) general conformity. Therefore, the Proposed Action would not trigger a general conformity determination under Section 176(c) of the CAA. The Navy has prepared a Record of Non-Applicability for Clean Air Act Conformity (See Appendix D of the EA).

Implementation of the Preferred Alternative would contribute directly to emissions of greenhouse gases (GHG) from the combustion of fossil fuels. Demolition, construction, and clearing activities would generate approximately 160.31 tons of carbon dioxide equivalent (CO2e) during 2022, approximately 350.40 tons of CO2e during 2023, and approximately 146.76 tons of CO2e during 2024. This limited amount of emissions would not likely contribute to global warming to any discernible extent. During the operational period, GHG emissions would be limited to those generated from routine operations and maintenance activities. These activities would continue at the same intensity as the pre-construction period. Therefore, no increase in GHG emissions is expected from the Preferred Alternative during the operational period.

Cultural Resources: The Preferred Alternative would result in less than significant impacts to cultural resources. The project is located in an area of low probability for archaeological resources. The existing Navy-commercial tie-in facility would be demolished, but it was determined to be ineligible for the National Register of Historic Places (Reed 2018). The project was reviewed pursuant to Stipulation VII.A of the November 2008 Programmatic Agreement among Commander, Navy Region Marianas, the Advisory Council on Historic Preservation, and the Guam Historic Preservation Officer regarding Navy undertakings on Guam, and no further action is required under Section 106 of the National Historic Preservation Act.

Infrastructure: The Preferred Alternative would result in less than significant impacts to infrastructure. The Preferred Alternative would include modifications to electrical, water, and communications service at the project site, but any potential increase in demand on these utility systems would be negligible. During construction, temporary bypasses would be installed for existing pipelines to minimize potential service impacts.

Hazardous Materials and Wastes: The Preferred Alternative would result in less than significant impacts involving hazardous materials and wastes. Precautionary measures and construction phasing would be implemented to minimize the potential risk for POL leaks or spills to occur. Lead-containing paint (LCP), lead-based paint (LBP), and asbestos-containing material (ACM) were identified during the survey of the existing tie-in facility. The contractor will be required to verify and assess the current site conditions. If LCP, LBP, and/or ACM are still present, lead hazard controls and/or asbestos hazard controls would be required prior to demolition.

Mitigation Measures: The Proposed Action will include the implementation of a range of best management practices (BMPs) and impact avoidance and minimization measures to limit potential impacts to environmental resources (See Tables 2-2 and 3-6 in the EA). Therefore, the Proposed Action will not result in significant impacts to environmental resources and no mitigation measures are required.

Public Outreach: The Navy released the Draft EA for a 30-day public review from December 9, 2021 to January 8, 2022 to inform the public of the Proposed Action and to allow the opportunity for public review and comment. A notice of availability of the Draft EA was published in the Guam Pacific Daily News on December 9, 12, and 13, 2021 and copies of the Draft EA were made available through a Navy webpage and at the Nieves Flores Memorial Library in Hagatna, Guam. No public comments were received during the public comment period for the Draft EA.

FINDING OF NO SIGNIFICANT IMPACT FOR THE NAVY-COMMERCIAL TIE-IN HARDENING (MILCON P-661), JOINT REGION MARIANAS, GUAM

Finding: Based on the analysis presented in the EA, which has been prepared in accordance with the requirements of NEPA and Navy policies and procedures (32 CFR Part 775), the Navy finds that implementation of the proposed action as set out in Alternative 1 (Preferred Alternative) will not significantly impact the quality of the human environment. This analysis fulfills the requirement of NEPA and CEQ regulations; therefore, an EIS will not be prepared.

Electronic copies of this EA and Finding of No Significant Impact may be obtained by written request to: Attention: Code EV21, Naval Facilities Engineering Systems Command Pacific, 258 Makalapa Drive, Suite 100, JBPHH, HI 96860

01 APR 2022
Date

B. R. NICHOLSON
Rear Admiral, U.S. Navy
Commander, Joint Region Marianas

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Abstract

Designation:	Environmental Assessment
Title of Proposed Action:	MILCON P-661 Navy-Commercial Tie-In
Project Location:	Joint Region Marianas, Guam
Lead Agency for the EA:	Department of the Navy
Affected Region:	Joint Region Marianas, Guam
Action Proponent:	Navy Base Guam
Point of Contact:	Mr. Edward Moon Environmental Director, Naval Base Guam Naval Facilities Engineering Command Marianas PSC 455 Box 195 FPO AP 96540-2937 (671) 339-4100 Edward.Moon@fe.navy.mil
Date:	February 2022

Naval Base Guam (NBG) a Command of the U.S. Navy (hereinafter, jointly referred to as the Navy), has prepared this Environmental Assessment in accordance with the National Environmental Policy Act (NEPA), as implemented by the Council on Environmental Quality Regulations and Navy regulations for implementing NEPA. The Navy proposes to replace an existing Navy/Commercial petroleum, oil, and lubricant (POL) tie-in, with a new, hardened tie-in facility. The new tie-in facility would be located to the southeast of the existing tie-in within the pipeline easement causeway between Highway 18 and Highway 1, in the vicinity of Apra Harbor, Guam. The Proposed Action would provide sufficient setbacks from those roadways, and the new tie-in would be constructed in sheltered vaults to protect it from potential threats and reduce its visibility. The Proposed Action is part of a broader Navy initiative to increase the resilience of critical infrastructure serving installations. This Environmental Assessment evaluates the potential environmental impacts associated with the two action alternatives and the No Action Alternative to the following resource areas: Biological Resources, Water Resources, Air Quality, Cultural Resources, Infrastructure, and Hazardous Materials and Wastes.

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EXECUTIVE SUMMARY

ES.1 Proposed Action

The United States Navy (Navy), Navy Base Guam (NGB) proposes to replace an existing Navy/Commercial petroleum, oil, and lubricant (POL) tie-in, with a new, hardened tie-in facility. The new tie-in facility would be located to the southeast of the existing tie-in within the pipeline easement causeway between Highway 18 and Highway 1, in the vicinity of Apra Harbor, Guam. The Proposed Action (MILCON P-661) would include hardening the new facility with reinforced concrete roof slabs and walls supported on concrete piles. Once completed, the new hardened tie-in facility will replace the Navy-owned tie-ins at the existing tie-in facility. Exposed Navy piping at the existing Navy-Commercial Tie-in will be capped and buried or removed. Site improvements and utility infrastructure would be constructed to support and protect the new tie-in facility.

The Proposed Action is part of a broader Navy initiative to increase the resilience of critical infrastructure serving installations on Guam. The existing Navy/Commercial tie-in was identified due to its location and visibility directly adjacent to Highway 18, the public roadway that leads out to Dry Dock Island. The Navy/Commercial Tie-In facility serves a complex network of Petroleum Oil Lubricant (POL) facilities and users including lines connecting terminal facilities at the commercial wharf (F) and the Navy wharves (D and E), Government of Guam's (GovGuam) Piti Power Plant, and the Navy's Sasa Valley Tank Farm. The Navy proposes to harden the infrastructure to make it less susceptible to damage from a Design Basis Threat (DBT). The project would also provide Anti-Terrorism Force Protection (ATFP) features in accordance with the United States Department of Defense (DoD) Minimum Anti-Terrorism Standards for Buildings.

ES.2 Purpose of and Need for the Proposed Action

The purpose of the Proposed Action is to protect the safe and adequate distribution of POL commodities for Navy and commercial uses. The Navy/Commercial Tie-In serves as an alternate fuel supply source between the Navy and commercial systems. The need for the Proposed Action is to minimize the risk of damage to Navy infrastructure and to assure the capability of distributing and dispensing fuel during a contingency. The Expeditionary Warfare Center (EXWC) has provided minimum design requirements for the hardening of POL lines and supporting facilities against potential DBTs.

ES.3 Alternatives Considered

Alternatives were developed for analysis and based upon reasonable alternative screening factors. The Navy is considering two action alternatives that meet the purpose of and need for the Proposed Action and a No Action Alternative.

ES.3.1 No Action Alternative

Under the No Action Alternative, the Proposed Action would not occur. The infrastructure at the Navy/Commercial Tie-In facility would not be changed to make it less susceptible to damage from DBTs. The project would not provide ATFP features and would not comply with ATFP regulations and physical security mitigation in accordance with the DoD Minimum Anti-Terrorism Standards for Buildings. The No Action Alternative would not meet the purpose and need for the Proposed Action; however, as required by the National Environmental Protection Act (NEPA), the No Action Alternative is carried forward for

analysis. The No Action Alternative will be used to analyze the consequences of not undertaking the Proposed Action, and will serve to establish a comparative baseline for analysis.

ES.3.2 Alternative 1: Construct a New Hardened Tie-In Facility (Preferred Alternative)

Under Alternative 1, the Navy proposes to construct a hardened shelter over and around a new Navy-Commercial Tie-In facility. Alternative 1 would include hardening the facility with reinforced concrete roof slabs and walls supported on concrete piles. Openings for the facility would consist of a system of hardened doors and louvers. The new tie-in facility would be located along the pipeline easement causeway southeast of the existing tie-in facility. Once completed, the new hardened tie-in facility would replace the Navy-owned tie-in manifolds at the existing tie-in facility. Once the new hardened tie-in facility is completed, the concrete walls of the existing Navy tie-in facility would be removed, and the existing valves would be replaced with straight pipe and then buried. Alternative 1 would increase the resilience of the Navy/Commercial tie-in to potential DBTs, and has been designed in accordance with EXWC minimum design requirements for the hardening of POL lines and supporting facilities. Additional improvements would include a new seismic isolation valve, a 20-foot wide paved access road, new fencing and security gates at both entrances to the causeway, and utility infrastructure serving the new hardened tie-in facility.

ES.3.3 Alternative 2: Construct a New Hardened Tie-In Facility at an Alternative Easement Location

Under Alternative 2, the Navy proposes to construct a hardened tie-in at another location along the pipeline easement causeway closer to Highway 1. The Preferred Alternative would provide a necessary standoff distance from the proposed hardened tie-in facility to Highway 18. Alternative 2 would instead locate the proposed hardened tie-in facility a necessary distance from Highway 1 (southeast along the causeway from the new hardened tie-in facility proposed in the Preferred Alternative). The construction methodology would be the same as with the Preferred Alternative. Site improvements be similar to the Preferred Alternative, except that the specific site improvements associated with the location of the hardened tie-in facility (i.e., routing the access road to the south of the tie-in facility and the associated grouted rip rap embankment) would be located further southeast along the causeway. Utility infrastructure would be similar to the Preferred Alternative except that Alternative 2 would require a longer extension of the proposed new water line because the location of the new hardened tie-in facility would be further from the water service point of connection .

ES.4 Summary of Environmental Resources Evaluated in the EA

Council on Environmental Quality regulations, NEPA, and Navy instructions for implementing the NEPA, specify that an Environmental Assessment (EA) should address those resource areas potentially subject to impacts. In addition, the level of analysis should be commensurate with the anticipated level of environmental impact.

The following resource areas have been addressed in this EA: biological resources, water resources, air quality, cultural resources, infrastructure, and hazardous materials and wastes. Because potential impacts were considered to be negligible or nonexistent, the following resources were not evaluated in this EA: geological resources, land use, visual resources, airspace, transportation, public health and safety, socioeconomics, and environmental justice.

ES.5 Summary of Potential Environmental Consequences of the Action Alternatives and Major Mitigating Actions

Table ES-1 provides a tabular summary of the potential impacts to the resources associated with each of the alternatives analyzed.

ES.6 Public Involvement

The Navy has coordinated with the U.S. Fish and Wildlife Service (USFWS) and Government of Guam Bureau of Statistics and Plans (GBSP) in the preparation of this EA. In addition, a notice of availability of the Draft EA was published in the local news media on December 9, 12, and 13, 2021 and copies of the Draft EA were made available through a Navy webpage and at the Nieves Flores Memorial Library in Hagatna, Guam. No public comments were received on the Draft EA during the 30-day public comment period that ended on January 8, 2022 (Chamorro Standard Time).

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Table ES-1 Summary of Potential Impacts to Resource Areas

Resource Area	*No Action Alternative*	*Alternative 1 (Preferred Alternative)*	*Alternative 2*
Biological Resources	No impact.	Less than significant impacts with implementation of best management practices and avoidance/minimization measures. The Preferred Alternative would result in the permanent loss of approximately 3,200 square feet (0.07 acres) of wetland adjacent to the POL causeway, but no plants of any conservation concern or critical habitat are present. The Navy determined and the USFWS concurred that the Preferred Alternative may affect, but is not likely to adversely affect (NLAA) the Mariana Common Moorhen with the implementation of avoidance/minimization measures. No significant impacts are expected to MBTA protected species.	Less than significant impacts. Alternative 2 is expected to have similar non-significant impacts as the Preferred Alternative. The difference is that the proposed Tie-In Facility for Alternative 2 would be located to the southeast along the POL causeway. Therefore, Alternative 2 would result in slightly more encroachment into the adjacent wetland because the wetland boundary is narrower in this location. Alternative 2 would result in the permanent loss of approximately 7,400 square feet (0.17 acres) of wetland adjacent to the POL causeway.
Water Resources	No impact.	Less than significant impacts. The Preferred Alternative would involve the clearing and grubbing of approximately 3,200 square feet (0.07 acres) of wetland adjacent to the POL causeway. Improvements associated with the new facilities would be designed based on the principles of low impact development (LID) and would not increase stormwater runoff from the project site into adjacent areas including the marine environment. Erosion control BMPs would be implemented, and conditions of the NPDES and CWA permits would be complied with to avoid and minimize the potential for construction related sediments and/or pollutants being transported into receiving wetlands and marine waters. The Preferred Alternative is located in the floodplain, but there are no practicable alternatives to relocate it outside of the floodplain, and it would not result in adverse direct or indirect effects to the floodplain.	Less than significant impacts. Alternative 2 is expected to have similar non-significant impacts as the Preferred Alternative. The difference is that the proposed Tie-In Facility for Alternative 2 would be located to the southeast along the POL causeway. Therefore, Alternative 2 would result in slightly encroachment into the adjacent wetland because the wetland boundary is narrower at this location. Alternative 2 would result in the permanent loss of approximately 7,400 square feet (0.17 acres) of wetland adjacent to the POL causeway.

Table ES-1 Summary of Potential Impacts to Resource Areas

Resource Area	*No Action Alternative*	*Alternative 1 (Preferred Alternative)*	*Alternative 2*
Air Quality	No impact.	Less than significant impacts. Short-term, temporarily-emitted air emissions (e.g., fugitive dust, combustion of fossil fuels) would be generated during the construction period. BMPs would be implemented to minimize fugitive dust during construction. The Preferred Alternative would upgrade the existing dirt access road to a paved road which is expected to reduce dust emissions from vehicle access. Therefore, an improvement in air quality is expected during the operational period. The project is located in a nonattainment area for sulfur dioxide (SO_2). Total construction SO_2 emissions would be below de minimis thresholds for Clean Air Act (CAA) general conformity. Therefore, the Proposed Action would not trigger a general conformity determination under Section 176(c) of the CAA. The Navy has prepared a Record of Non-Applicability for Clean Air Act Conformity (Appendix D).	Less than significant impacts. Alternative 2 would have similar, non-significant impacts as the Preferred Alternative because it would utilize the same construction equipment and methods, and have the same construction duration. The difference is that the proposed Tie-In Facility for Alternative 2 would be located further from the project staging area than the Preferred Alternative. This additional distance would result in greater emissions for construction tasks associated with the new tie-in facility.
Cultural Resources	No impact.	Less than significant impacts. The project is located in an area of low probability for archaeological resources. The existing Navy-commercial tie-in facility would be demolished, but it was determined to be ineligible for the NRHP (Reed 2018). The project was reviewed pursuant to Stipulation VII.A of the November 2008 PA among CNRM, ACHP, and GHPO regarding Navy undertakings on Guam, and no further action is required under Section 106 of the NHPA.	Less than significant impacts. Impacts would be the same as the Preferred Alternative.

Table ES-1 Summary of Potential Impacts to Resource Areas

Resource Area	*No Action Alternative*	*Alternative 1 (Preferred Alternative)*	*Alternative 2*
Infrastructure	No impact.	Less than significant impacts. The Preferred Alternative would include modifications to electrical, water, and communications service, but any potential increase in demand on these utility systems would be negligible. During construction, temporary bypasses would be installed for existing pipelines to minimize potential service impacts.	Less than significant impacts. Impacts would be the same as the Preferred Alternative.
Hazardous Wastes and Materials	No impact.	Less than significant impacts. Precautionary measures and construction phasing would be implemented to minimize the potential risk for leaks or spills to occur. LCP, LBP, and ACM were identified during the survey of the existing tie-in facility. The contractor will be required to verify and assess the current site conditions. If LCP, LBP, and/or ACM are still present, lead hazard controls and/or asbestos hazard controls would be required prior to demolition.	Less than significant impact. Impacts would be the same as the Preferred Alternative.

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Final Environmental Assessment

Navy-Commercial Tie-In Hardening (MILCON P-661)

Joint Region Marianas, Guam

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Appendices

Abbreviations and Acronyms

Acronym	Definition
AAQS	Ambient Air Quality Standards
ACM	asbestos containing material
APE	Area of Potential Effect
ATFP	Anti-Terrorism Force Protection
BMP	best management practice
CAA	Clean Air Act
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CHT	Collection Handling and Transport
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
CWA	Clean Water Act
CZMA	Coastal Zone Management Act
DBT	Design Basis Threats
DERP	Defense Environmental Restoration Program
DLADS	Defense Logistics Agency Disposition Services
DoD	United States Department of Defense
EA	Environmental Assessment
EIS	Environmental Impact Statement
EISA	Energy Independence and Security Act
EO	Executive Order
ESA	Endangered Species Act
EXWC	Expeditionary Warfare Center
FONSI	Finding of No Significant Impact
GBSP	Guam Bureau of Statistics and Plans
GCMP	Guam Coastal Management Plan
GEPA	Guam Environmental Protection Agency
GHG	greenhouse gas
GHPI	Guam Historic Places Inventory
GovGuam	Government of Guam
GPA	Guam Power Authority
GWA	Guam Water Authority
GWQS	Guam Water Quality Standards
HAP	hazardous air pollutant
HWMP	hazardous waste management program
ICRMP	Integrated Cultural Resources Management Plan
INRMP	Integrated Natural Resources Management Plan
IRP	Installation Restoration Program
JRM	Joint Region Marianas
LBP	lead based paint
LCP	Lead containing paint
LEED	Leadership in Energy and Environmental Design
LID	Low Impact Development
LUC	Land use controls
MBTA	Migratory Bird Treaty Act
MEC	Munitions and explosives of concern
mgd	million gallons per day
mg/kg	milligrams per kilogram
MILCON	Military Construction
MPA	Marine Protected Area
MSAT	Mobile Source Air Toxics
MW	megawatt
NAAQS	National Ambient Air Quality Standards
Navy	Department of the Navy
NBG	Naval Base Guam

Acronym	Definition
NCTS	Naval Computer and Telecommunications Station
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NLAA	May affect, but not likely to adversely affect
NO_2	nitrogen dioxide
NOA	notice of availability
NOAA	National Oceanic and Atmospheric Administration
NOx	Nitrogen oxide
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
OPNAV	Office of the Chief of Naval Operations
OPNAVINST	Office of the Chief of Naval Operations Instruction
PA	Programmatic agreement
PAG	Port Authority of Guam
Pb	lead
PCB	polychlorinated biphenyl
PM_{10}	particulate matter less than or equal to 10 microns in diameter
$PM_{2.5}$	particulate matter less than or equal to 2.5 microns in diameter
POL	petroleum, oil, and lubricant
ROI	Region of Influence
RONA	Record of Non-Applicability
SHPO	State Historic Preservation Officer
SIP	State Implementation Plan
SO_2	sulfur dioxide
SOP	standard operating procedure
SWPPP	Stormwater Pollution Prevention Plan
TCP	Traditional cultural place
TPY	Tons Per Year
TSCA	Toxic Substances Control Act
UEMMS	Underwater electromagnetic measurement system
U.S.C.	United States Code
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USMC	U.S. Marine Corps
UXO	Unexploded ordnance
WTP	Water treatment plant
WWTP	Wastewater treatment plant

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1 Purpose of and Need for the Proposed Action

1.1 Introduction

Naval Base Guam (NBG), a Command of the U.S. Navy (hereinafter, jointly referred to as the Navy), has prepared this Environmental Assessment (EA) in accordance with the National Environmental Policy Act (NEPA), as implemented by the Council on Environmental Quality (CEQ) Regulations and Navy regulations for implementing NEPA. The Proposed Action (MILCON P-661) would replace an existing Navy/Commercial petroleum, oil, and lubricant (POL) tie-in. The new tie-in facility would be located to the southeast of the existing tie-in within the pipeline easement causeway between Highway 18 and Highway 1, in the vicinity of Apra Harbor, Guam. This new location would provide sufficient setbacks from public roadways. The new tie-in would be constructed in sheltered vaults to further reduce its visibility.

1.2 Background

The Proposed Action is part of a broader Navy initiative to increase the resilience of critical infrastructure serving installations on Guam. The existing Navy/Commercial tie-in was identified due to its location and visibility directly adjacent to Highway 18, the public roadway that leads out to Dry Dock Island. The Navy/Commercial Tie-In facility serves a network of Petroleum Oil Lubricant (POL) facilities and users including lines connecting terminal facilities at the commercial wharf and the Navy wharves, Government of Guam's (GovGuam) Piti Power Plant, and the Navy's Sasa Valley Tank Farm. The Navy proposes to harden the infrastructure to make it less susceptible to damage from a Design Basis Threat (DBT). The project would also provide Anti-Terrorism Force Protection (ATFP) features in accordance with the United States Department of Defense (DoD) Minimum Anti-Terrorism Standards for Buildings.

1.3 Location

The Navy on Guam supports naval activities to maintain operational readiness—maintaining the ability of units to respond to regional threats and to protect interests of the U.S. and its allies. NBG is the Navy's operations center and is located on the southwest coast of Guam around Apra Harbor, including the Orote Peninsula. It serves as the forward deployment base and logistics hub, including main munitions storage and distribution center for sea, land, and air forces operating in Asia and the Western Pacific.

Navy-controlled lands at Apra Harbor have land uses ranging from industrial to recreational. Other lands on Guam are used for communications facilities (Naval Communication Annex, also known as Naval Computer and Telecommunications Station [NCTS], Finegayan [communications receivers], and Barrigada [communications transmitters]); family housing/community support (Apra Heights, Nimitz Hill, and NCTS Finegayan), POL storage areas (Defense Logistics Agency and Defense Fuels also known as Sasa Valley and Tenjo Vista fuels farms); munitions storage facilities (Naval Munitions Site also known as Naval Magazine Apra Heights); the Naval Hospital; a United States Department of Defense (DoD) Education Activity high school (adjacent to the Naval Hospital); a Military Operations on Urban Terrain training range; and Navy golf course at Barrigada. Naval Base Guam covers about 4,500 acres on the west-central coast of Guam. It surrounds Apra Harbor and includes all of Orote Peninsula, as well as a low, largely marshy area along the east side of the harbor.

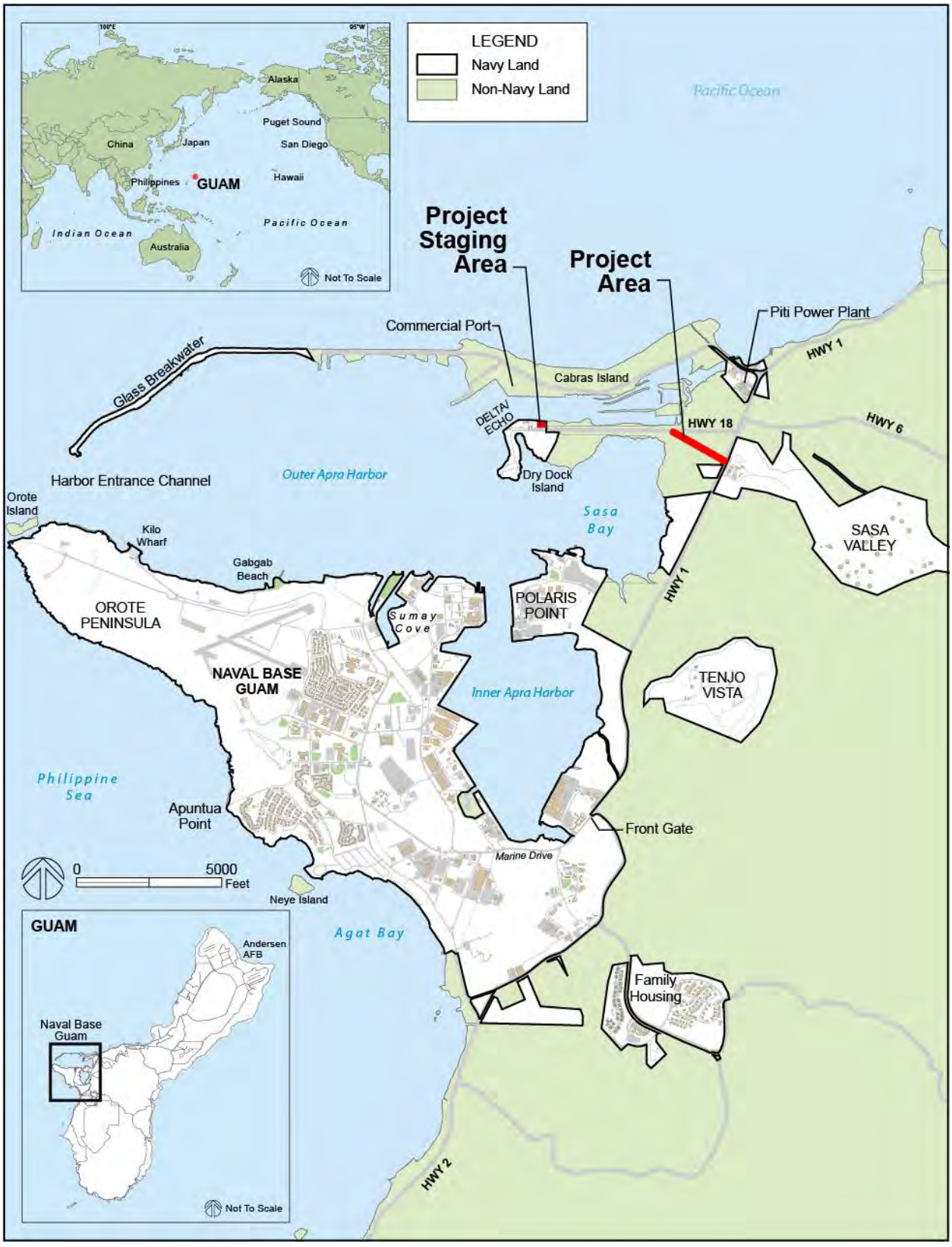

Figure 1-1 Location Map

The existing Navy/Commercial tie-in is located along the south side of Highway 18, where the Highway intersects with the Navy and Commercial pipeline easement causeway. The proposed hardened tie-in facility would be located to the southeast on the causeway. The project area for the Proposed Action includes the entire causeway from Highway 18 to Highway 1 due to the supporting infrastructure that would be located along the causeway (Figure 1-1).

1.4 Purpose of and Need for the Proposed Action

The purpose of the Proposed Action is to continue to facilitate the safe and adequate supply of POL commodities from Navy and commercial fueling ports to Navy and Commercial storage facilities. The Navy/Commercial Tie-In serves as an alternate fuel supply source between the Navy and commercial systems. The need for the Proposed Action is to increase the resilience of Navy POL infrastructure and to assure the capability of distributing and dispensing fuel during a contingency. The Expeditionary Warfare Center (EXWC) has provided minimum design requirements for the hardening of POL lines and supporting facilities against potential threats.

1.5 Scope of Environmental Analysis

This EA includes an analysis of potential environmental impacts associated with the action alternatives and the No Action Alternative. The environmental resource areas analyzed in this EA include: biological resources, cultural resources, air quality, infrastructure, water resources, and hazardous materials and wastes.

1.6 Key Documents

Key documents are sources of information incorporated into this EA. Documents are considered to be key because of similar actions, analyses, or impacts that may apply to this Proposed Action. CEQ guidance encourages incorporating documents by reference. Documents incorporated by reference in part or in whole include:

- *Wetland Delineation Report for MCON Project P-661 Navy-Commercial Tie-In Hardening Piti, Guam* (Duenas, Camacho & Associates, Inc., 2017). The report summarizes the findings of the wetlands delineation conducted in August and September 2017.
- *Guam and Tinian Wetlands Inventory* (AECOS and Wil Chee Planning, 2009). This document presents an overview of known wetlands on lands under Navy jurisdiction on Guam.
- *Integrated Natural Resources Management Plan (INRMP) for Joint Region Marianas* (Navy, 2018). The INRMP charts a course for natural resources management on Joint Region Marianas (JRM), which includes Navy and Air Force holdings on Guam.
- *Integrated Cultural Resources Management Plan (ICRMP), Naval Base Guam, Joint Region Marianas* (NAVFAC Marianas, 2015). This ICRMP is intended to provide procedural guidance for identifying, evaluating, and managing historic properties located at Naval Base Guam.
- *Final Supplemental Environmental Impact Statement, Guam and Commonwealth of the Northern Mariana Islands Military Relocation (2012 Roadmap Adjustments)* (Navy, 2015). Describes the baseline environment of lands under Navy jurisdiction on Guam.

1.7 Relevant Laws and Regulations

The Navy has prepared this EA based upon federal and state laws, statutes, regulations, and policies pertinent to the implementation of the Proposed Action, including the following:

- Chief of Naval Operations (OPNAV) Instruction 5090.1E; Environmental Readiness Program Manual
- Clean Air Act (42 U.S.C. section 7401 et seq.)
- Clean Water Act (33 U.S.C. section 1251 et seq.)
- Coastal Zone Management Act (16 U.S.C. section 1451 et seq.)
- Council on Environmental Quality Regulations for Implementing the Procedural Provisions of NEPA (40 Code of Federal Regulations parts 1500–1508)
- Endangered Species Act (16 U.S.C. section 1531 et seq.)
- Energy Independence and Security Act (42 U.S.C. 17094)
- Executive Order (EO) 11988, Floodplain Management
- EO 12088, Federal Compliance with Pollution Control Standards
- EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-income Populations
- EO 13045, Protection of Children from Environmental Health Risks and Safety Risks
- EO 14057 Catalyzing Clean Energy Industries and Jobs Through Federal Sustainability
- Federal Water Pollution Control Act, 33 U.S.C. sections 1251–1387
- Final Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in NEPA Reviews
- Guam Air Pollution Control Standards and Regulations (Regulation 1302, Chapter 1, Title 22 of Guam Administrative Rules and Regulations)
- National Environmental Policy Act (NEPA) (42 United States Code [U.S.C.] sections 4321–4370h), which requires an environmental analysis for major federal actions that have the potential to significantly impact the quality of the human environment.
- Navy regulations for implementing NEPA (32 Code of Federal Regulations part 775), which provides Navy policy for implementing Council on Environmental Quality regulations and NEPA.
- National Historic Preservation Act (54 U.S.C. section 306108 et seq.)
- Migratory Bird Treaty Act (16 U.S.C. section 703–712)
- Toxic Substances Control Act (15 U.S.C. sections 2601–2629)

A description of the Proposed Action's consistency with these laws, policies and regulations, as well as the names of regulatory agencies responsible for their implementation, is presented in Chapter 5.

1.8 Public and Agency Participation and Intergovernmental Coordination

Regulations from the CEQ direct agencies to involve the public in preparing and implementing their NEPA procedures. The Navy prepared a Draft EA to inform the public of the Proposed Action and to allow the opportunity for public review and comment. The 30-day Draft EA review period began on December 9, 2021 with a public notice published in the local news media indicating the availability of

the Draft EA and the locations where public review copies were available. The Draft EA was also available on the following website:

https://www.navfac.navy.mil/navfac_worldwide/pacific/about_us/nationalenvironmental- policy-act--nepa--information.html.

No comments on the Draft EA were received during the public comment period that ended on January 8, 2022 (Chamorro Standard Time).

Pursuant to Section 7 of the Endangered Species Act, the Navy has consulted with the U.S. Fish and Wildlife Service (USFWS) regarding the Preferred Alternative. The Navy determined that the Preferred Alternative may affect, but is not likely to adversely affect (NLAA) the Mariana common moorhen in a letter to the USFWS dated September 17, 2020. The USFWS concurred with the Navy's NLAA determination in a return letter dated November 19, 2020 (see Appendix A).

The entire island of Guam has been designated a "coastal zone" under the Federal Coastal Zone Management Act (CZMA) of 1972. The CZMA requires that all construction and operational activities be consistent, to the maximum extent practicable, with the Guam Coastal Management Program (GCMP) policies to guide the use, protection, and development of land and ocean resources within Guam's coastal zone (Guam Bureau of Statistics and Plans [GBSP], 2011). In accordance with the CZMA, the Navy determined that the Preferred Alternative is consistent to the maximum extent practicable with the federally approved enforceable policies of the GCMP. The Navy submitted a Consistency Determination on the Preferred Alternative to GBSP requesting their review and concurrence. The Navy received GBSP's conditional concurrence on this determination via correspondence dated November 8, 2021 (see Appendix B).

In July 2008, the Commander, Navy Region Marianas entered into a Programmatic Agreement (PA) with the Advisory Council on Historic Preservation and the Guam Historic Preservation Officer regarding Navy undertakings on Guam. Per Stipulation VII.A of the PA, the Preferred Alternative was reviewed by Navy Personnel and they determined that the undertaking is located in an area identified as having a low probability for archaeological resources, and that it does not have the potential to cause effects to historic properties. Therefore, no further review under the PA or Section 106 of the National Historic Preservation Act (NHPA) is required.

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2 Proposed Action and Alternatives

2.1 Proposed Action

The Navy proposes to replace an existing Navy/Commercial POL tie-in, with a new, hardened tie-in facility. The Proposed Action is part of a broader Navy initiative to increase the resilience of critical infrastructure serving installations on Guam. The Navy/Commercial Tie-In facility serves a complex network of POL facilities and users including lines connecting terminal facilities at the commercial wharf (F) and the Navy wharves (D and E), GovGuam's Piti Power Plant, and the Navy's Sasa Valley Tank Farm. The Navy proposes to replace the existing tie-in with a new hardened tie-in facility to make it less susceptible to damage from DBT.

2.2 Screening Factors

NEPA's implementing regulations provide guidance on the consideration of alternatives to a federally proposed action and require rigorous exploration and objective evaluation of reasonable alternatives. Only those alternatives determined to be reasonable and to meet the purpose and need require detailed analysis.

Potential alternatives that meet the purpose and need were evaluated against the following screening factors:

1. Minimizes visibility of the tie-in infrastructure
2. Maximizes the resilience of the tie-in infrastructure
3. Minimizes impacts to wetlands
4. Compatibility with ATFP features and regulations
5. Compliance with regional guidance

Various alternatives were evaluated against the screening factors. The alternatives considered are listed in Table 2-1.

Table 2-1 List of Considered Alternatives

Description	***Status***
No Action Alternative	Carried forward for analysis
Alternative 1: Construct a New Hardened Tie-In Facility	Carried forward for analysis (preferred alternative)
Alternative 2: Construct a New Hardened Tie-In Facility at an Alternative Easement Location	Carried forward for analysis
Alternative 3: Relocate Pipelines and Construct a New Hardened Tie-In Facility	Dismissed
Alternative 4: Construct A Hardened Tie-In Structure in Place of The Existing Tie-In	Dismissed
Alternative 5: Construct a New Unhardened Tie-In Facility	Dismissed

2.3 Alternatives Carried Forward for Analysis

Based on the reasonable alternative screening factors and meeting the purpose and need for the Proposed Action, the No Action Alternative and two action alternatives were identified and will be analyzed within this EA.

2.3.1 No Action Alternative

Under the No Action Alternative, the Proposed Action would not occur. The infrastructure at the Navy/Commercial Tie-In facility would not be changed to make it less susceptible to damage from DBTs. The project would not provide ATFP features and would not comply with ATFP regulations and physical security mitigation in accordance with the DoD Minimum Anti-Terrorism Standards for Buildings. The No Action Alternative would not meet the purpose and need for the Proposed Action; however, as required by NEPA, the No Action Alternative is carried forward for analysis in this EA. The No Action Alternative will be used to analyze the consequences of not undertaking the Proposed Action, and will serve to establish a comparative baseline for analysis.

2.3.2 Alternative 1: Construct a New Hardened Tie-In Facility (Preferred Alternative)

Under Alternative 1, the Navy proposes to construct a hardened shelter over and around a new Navy-Commercial Tie-In facility. Alternative 1 would include hardening the facility with reinforced concrete roof slabs and walls supported on concrete piles. Openings for the facility will consist of a system of hardened doors and louvers. The new tie-in facility would be located along the pipeline easement causeway southeast of the existing tie-in facility. Once completed, the proposed new hardened tie-in facility would replace the Navy-owned tie-in manifolds at the existing tie-in facility. Once the construction of the new tie-in facility is completed, the Navy-owned piping at the existing tie-in facility would be capped and buried or removed. Alternative 1 has been designed in accordance with EXWC minimum design requirements for the hardening of POL lines and supporting facilities. The design requirements exceed those required for standard ATFP and thereby the level of protection provided exceeds ATFP requirements.

2.3.2.1 Real Property

The Preferred Alternative would be constructed on land that is currently owned by GovGuam. The use of the causeway for POL pipelines is provided by two separate but parallel easements. The 40-foot wide Navy pipeline easement runs along the north edge of the causeway, and the 30-foot wide commercial (TriStar) pipeline easement runs along the south edge of the causeway. The Navy and commercial easements are separated by a 5-foot wide gap of GovGuam-owned land that is not encumbered by any existing easement. The Preferred Alternative includes infrastructure and site improvements that will be constructed on both easements and the unencumbered GovGuam land. Therefore, the construction of the Preferred Alternative and future access to the facilities will require additional rights-of-entry, easements, and/or other agreements between the GovGuam, the Navy, and TriStar.

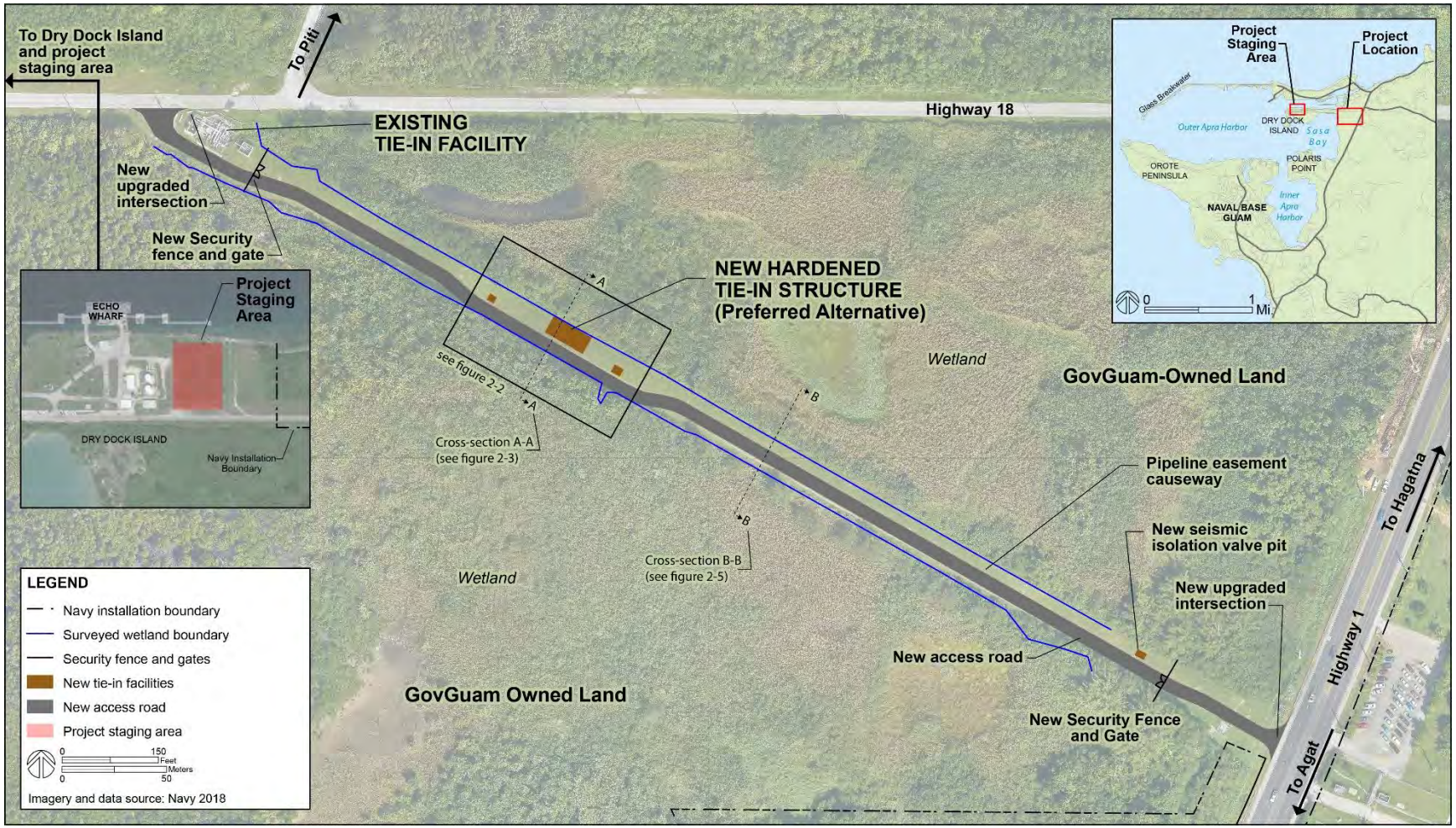

Figure 2-1 Preferred Alternative Project Vicinity Map

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2.3.2.2 Project Components

Temporary bypass of Navy-owned piping

During the initial stage of construction, the Navy would install bypass pipelines to route the existing Navy pipelines around the proposed new hardened tie-in facility. This would ensure that there would be minimal impact to POL service during construction. The bypass pipelines would be routed along the southern portion of the causeway (i.e., within the TriStar easement) to avoid the area required for the construction of the new hardened tie-in facility.

Construction of the new hardened tie/in facility

The new hardened tie-in facility would be located southeast along the causeway from the existing tie-in. The new hardened tie-in structure would house the valve vault and tie-in equipment to the Navy pipelines and would span approximately half of the causeway (see Figure 2-2 and 2-3). The new structure has exterior dimensions of approximately 56 feet by 26 feet with a gross floor area of 1,456 square feet. The structure will be approximately 25.5 feet tall, and the valve vault would have a pit depth of approximately six feet below finished grade (approximately six feet above mean sea level). The new hardened tie-in structure would be constructed with reinforced concrete roof slabs and walls supported on concrete piles. Openings for the facility will consist of a system of hardened doors and louvers.

Seismic Isolation Valve Pit

An additional seismic isolation valve pit would be constructed on the POL causeway Highway 1 (Figure 2-1). The seismic isolation valves would serve Navy-owned lines, so the pit would be located within the Navy easement. Construction of these valves may occur concurrently with other project tie-ins to minimize pipeline shutdowns.

Burial of Navy piping and demolition of select structures at the existing tie-in facility

The existing tie-in facility consists of two concrete block, open-topped vaults that are approximately 17 feet by 28 feet and 17 feet by 18 feet respectively. The entire complex is approximately 60 feet by 80 feet and has site walls and a perimeter fence. The proposed new hardened tie-in facility would replace the Navy-owned tie-in manifolds at the existing tie-in facility. Once the construction of the new tie-in facility is completed, the concrete walls of the existing Navy tie-in facility would be removed, and the existing valves would be replaced with straight pipe and then buried.

Site improvements

A 20-foot wide (minimum) paved access road would be provided for the entire length of the fuel easement causeway, from its intersection with Highway 18 to Highway 1. The access road would allow for the safe operation and maintenance of the project site as well as providing fire department access. Construction of the road would require earthwork, fill, and grading. Newly graded areas and areas disturbed during construction would be revegetated with grass. The road section would be developed in a way that stormwater runoff drains to vegetated swale areas. The new access road would include new upgraded intersections at Highway 18 and Highway 1, which would require the associated approvals and coordination with GovGuam Department of Public Works.

For most of the causeway, the access road would run along the middle of the causeway (see Figure 2-4 and 2-5). However, the road would be required to run along the south side of the causeway in the vicinity of the new hardened tie-in structure (see Figure 2-2 and 2-3). Due to the limited width of the

causeway in total, and the finished floor elevation requirements of the new Navy valve vault, the embankments along both the roadway and the hardened tie-in structure would be stabilized in this location. This would include the installation of approximately 400 linear feet of grouted rip rap along the southern causeway embankment (along the road), and 100 linear feet of grouted riprap along the northern causeway embankment (along the hardened tie-in structure). Construction of the grouted riprap embankment would extend into the adjacent wetland areas (see Figure 2-2).

The access road would also be required to run along the south side of the causeway in the vicinity of the existing tie-in facility near Route 18. The southern causeway embankment (adjacent to the proposed access road) would need to be stabilized at this location with approximately 150 linear feet of grouted riprap. In this area, the adjacent wetland is not located directly adjacent to the causeway, so the construction of the grouted riprap embankment would not extend into the wetland areas.

To provide the necessary security for the new tie-in facility, a vehicle crash-resistant fence and lockable gate would be provided at each entry point of the access road. One security fence and gate would be located approximately 150 feet southeast of the intersection of the causeway and Highway 18. The other security fence and gate would be located approximately 200 feet northwest of the intersection of the causeway and Highway 1. The security fence and gate would be at least seven feet above finished grade. Footings for the fence and gate would extend approximately 3.5 feet below grade. Fencing would be extended 5 feet past the last footing on either edge of the causeway into the adjacent vegetation. Extending the fence would provide adequate security but avoid the need to place footings in the adjacent wetland. No fencing and gate will be provided around the hardened structure itself.

Pole-mounted roadway lighting shall be provided from the two entrance gates to the hardened structure. Security lighting would be fully-shielded and downward facing to minimize impacts to birds.

Utility infrastructure

A new 8-inch water service line will be provided to serve the new hardened tie-in structure. This waterline will supply two fire hydrants, an internal fire sprinkler system, and water needs of the facility. The new waterline would be buried under the new access road, and would be connected to an existing waterline along Route 18. Since the end of the line near the proposed hardened tie-in structure is considered a dead-end, an automatic flushing device would be needed at the end of the line. Water supply to the building would be provided with a water meter and backflow preventer.

No wastewater service will be required at the tie-in facility. However, the Preferred Alternative would involve the relocation and adjustment of an existing Collection Handling and Transport (CHT) wastewater line. The relocation and adjustment of the CHT wastewater line may require the construction of a temporary by-pass line.

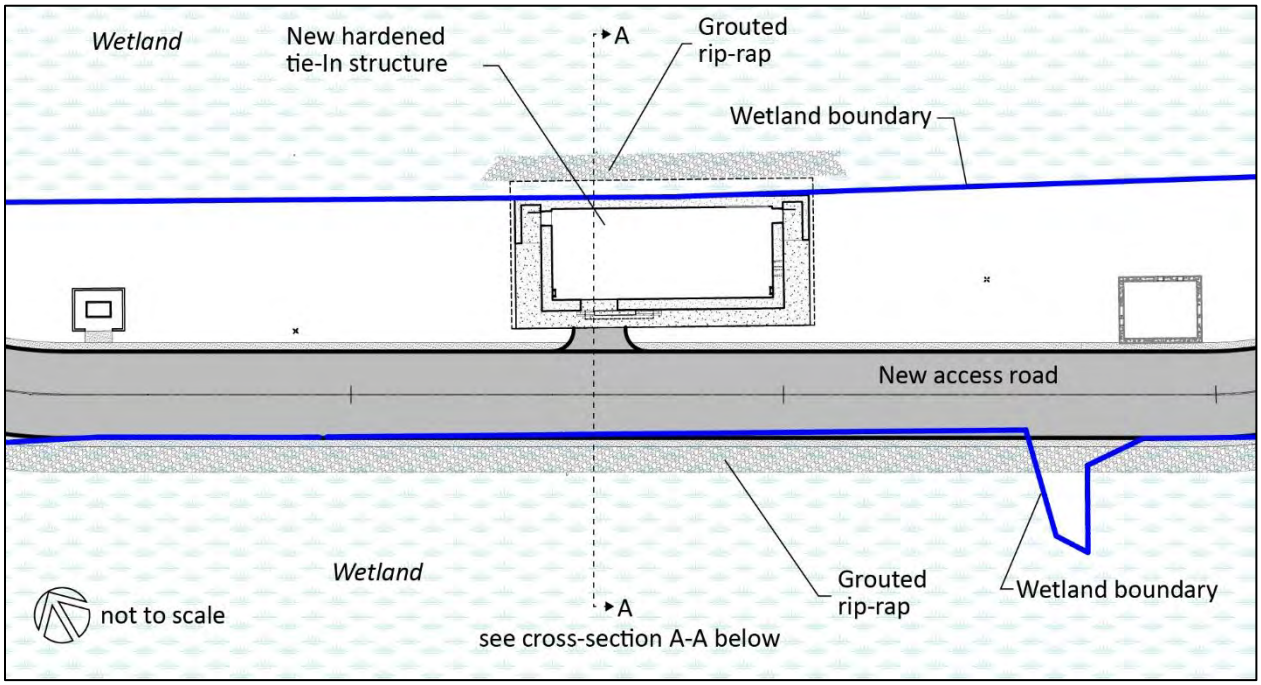

Figure 2-2 Site plan at the new hardened tie-in facility

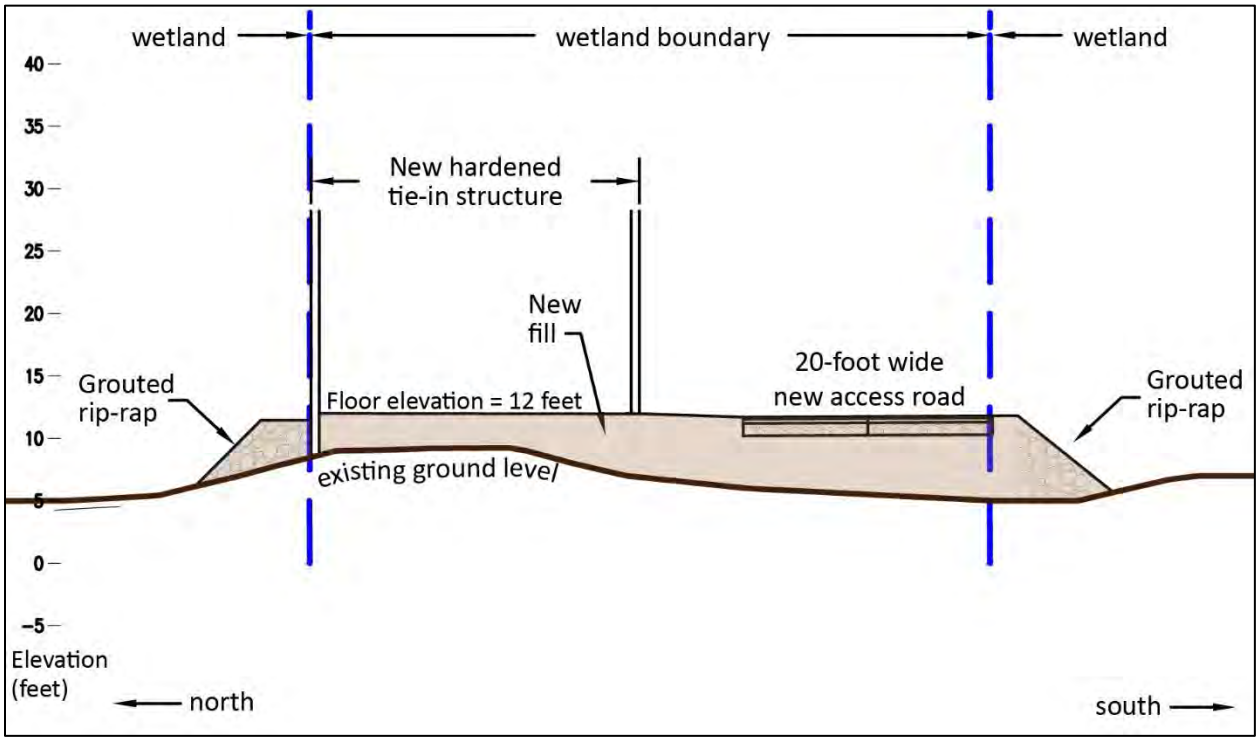

Figure 2-3 Cross-section A-A at the new hardened tie-in facility

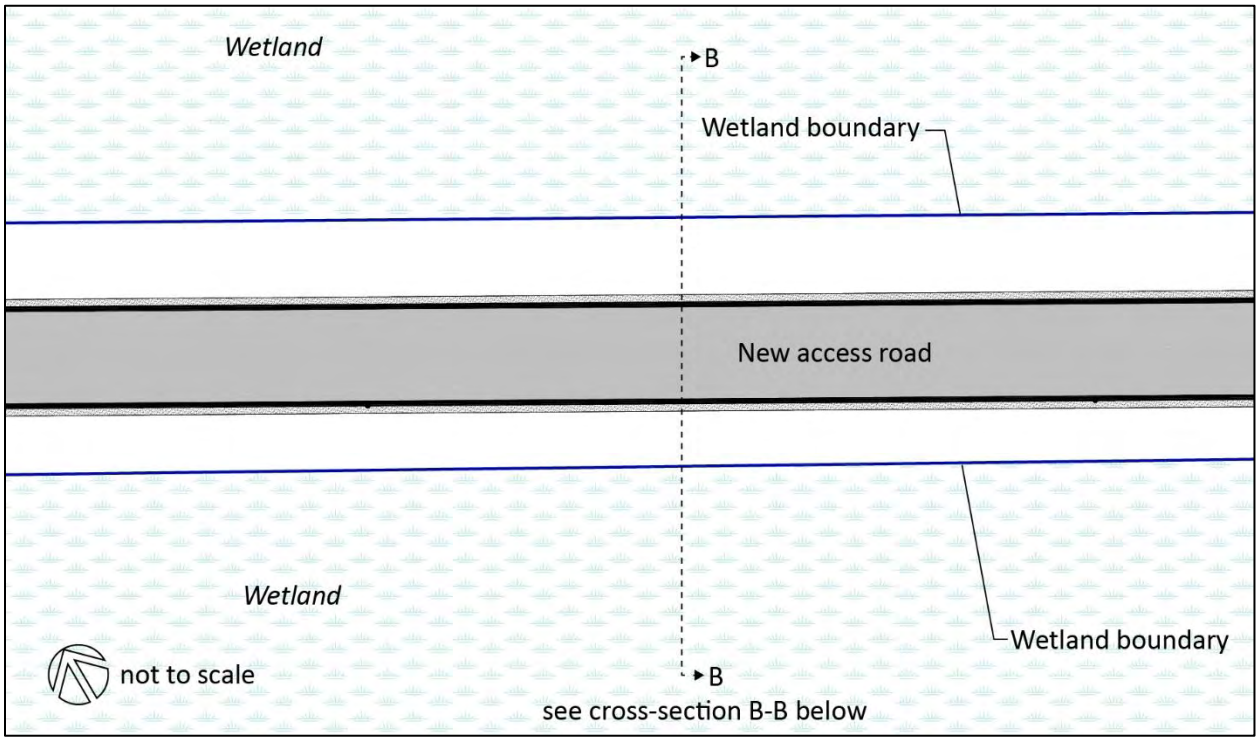

Figure 2-4 Typical site plan for the new access road

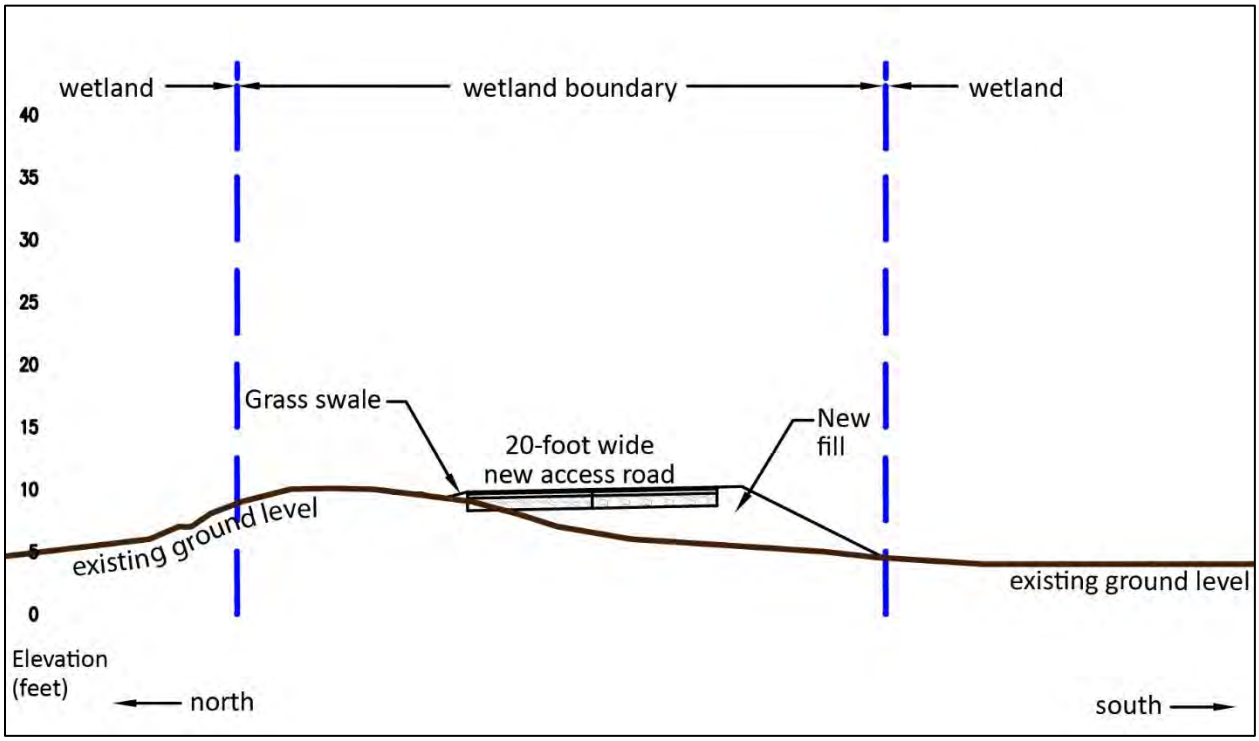

Figure 2-5 Cross-section B-B, typical cross-section for the new access road

Electrical utilities would include primary and secondary electrical distribution and in-ground cathodic protection for the underground piping. The electrical point of connection for the new facility will be obtained from the existing overhead primary electrical system. Primary electrical facilities would consist of underground electrical distribution system consisting of traffic-rated manholes and concrete encased duct bank that would connect to a pad mounted transformer dedicated to the new facility. From the transformer, an underground secondary service would be provided and would terminate at an enclosed circuit breaker installed within the new hardened tie-in structure. Electrical utilities would extend along the entire length of the causeway and would also provide electricity for the two entrance gates, and for the pole-mounted roadway lighting.

New communications lines would also be housed in the concrete duct bank. New communications systems would include outside plant fiber-optic, fire alarm system, cabling and infrastructure to support the installation of security systems at the project site.

Construction Methodology

The site is long and narrow, with very little space to move around the structure as it is being built. The flat section of the causeway is approximately 31 feet wide, which provides a long (2,000 feet) but narrow laydown space during construction. The flat space is wider at each end of the causeway, and the space near Route 18, where the existing Tie-In is located, may be used for staging activity that needs to move down the causeway. A larger 20,000-square foot construction staging area would be established approximately one mile west of the project site on Navy land adjacent to Echo Wharf. The staging area is relatively far from the site and Route 18 is a public road; however, the road is straight with good visibility and there is minimal public traffic.

Site preparation would include clearing, grubbing, and earthwork. The construction site for the new hardened tie-in facility would be approximately 100 feet by 80 feet, temporarily extending 10 to 20 feet beyond the current grassy area on both sides of the existing access road. Vehicle traffic through the site would not be possible while the buried pipes are exposed and the hardened structure is being constructed. Therefore, both ends of the access road would be used extensively during construction, and would be improved by adding a six-inch layer of gravel along the entire 2,000 feet and widening it from the current six feet to 10 feet. After the new tie-in facility is completed, the new hardened structure and upgraded access road would be constructed.

The new hardened tie-in structure would be constructed on a series of 24-inch octagonal, prestressed, concrete piles. Equipment needed for pile installation generally consists of a crawler-mounted pile driving crane with a pile driving hammer mounted on leads fixed to the crane, and a second crane to lift and position piles during the driving. Driven pile foundations are typically installed using impact hammers. For this project, it is anticipated that a hydraulic and/or diesel impact hammer would be used for pile installation.

Permanent vegetation clearing, including the grubbing of root balls and surrounding soils, within the permanent construction footprint (riprap areas, tie-in structure, access road, etc.) shall be contained as closely as possible within the design-specified dimensions of those structures. Clearing of vegetation in areas outside of the permanent construction footprint during the project construction phase (temporary wetland impact areas to facilitate access) shall be done using only hand tools to the maximum extent practicable. This work may include chainsaws. The contractor will also be responsible to cut vegetation down to ground level, to the maximum extent practicable, in these areas. Root balls and/or surrounding soils shall not be removed. The contractor shall flag off all wetland areas outside of the permanent and

temporary construction footprints where no clearing or grubbing will take place. Furthermore, any mechanized in-water work which takes place within the construction footprint shall be done with rubber-tired machinery to minimize impacts to wetland soils.

Due to the depth of excavation required for the proposed new-tie-in facility, dewatering would be required during construction. Sheet piles would likely to be used to limit the extent of excavation. Sheets would be driven with a vibratory hammer and would remain in place for the duration of the below grade construction. Specific dewatering methods would be determined by the contractor, but they could include a well point system or sump. Well point systems consist of pipes inserted into the ground to pump the water outside the limits of excavation. A sump is a pit dug inside the excavation area with a pump hose to remove the water. Water removed from the excavation area during the dewatering process would be routed to a detention swale within the causeway.

Construction of the Preferred Alternative would incorporate Leadership in Energy and Environmental Design, (LEED), Low Impact Development (LID) principles, and sustainable development concepts to achieve optimum resource efficiency, sustainability, and energy conservation.

2.3.2.3 Tie-In Operations

Once construction of the Preferred Alternative is completed, operations of the Navy and commercial tie-in valves would continue similar to current conditions. The Preferred Alternative would not affect the intensity of operations or maintenance required for the facilities. Implementation of the Preferred Alternative would improve the resilience and security of the tie-in facilities, which would help to minimize the potential for future disruptions to POL service.

2.3.3 Alternative 2: Construct a New Hardened Tie-In Facility at an Alternative Easement Location

Under Alternative 2, the Navy proposes to construct a hardened tie-in at another location along the pipeline easement causeway closer to Highway 1 (Figure 2-6). The Preferred Alternative would provide a necessary standoff distance from the proposed hardened tie-in facility to Highway 18. Alternative 2 would instead locate the proposed hardened tie-in facility a necessary distance from Highway 1 (southeast along the causeway from the new hardened tie-in facility proposed in the Preferred Alternative).

2.3.3.1 Real Property

Alternative 2 would be constructed within the same easements and unencumbered GovGuam-owned land as the Preferred Alternative. Therefore, the construction of the Alternative 2 and future access to the facilities would require the same real property agreements as the Preferred Alternative.

2.3.3.2 Project Components

Under Alternative 2, the construction methodology would be the same as with the Preferred Alternative. The Navy would install a temporary bypass around Navy-owned piping, and construct a seismic isolation valve pit. Once the construction of the new tie-in facility is completed, the concrete walls of the existing tie-in facility would be removed, and the existing valves would be replaced with straight pipe and then buried.

The new-hardened tie-in structure would be constructed to the same standards as in the Preferred Alternative, except that it would be in a slightly different location further southeast along the causeway. Site improvements associated with Alternative 2 would be similar to the Preferred Alternative, except

that the specific site improvements associated with the location of the hardened tie-in facility (i.e., routing the access road to the south of the tie-in facility and the associated grouted rip rap embankment) would be located further southeast along the causeway. Compared to the Preferred Alternative, the surveyed wetland boundary is narrower in the vicinity of the new tie-in facility proposed by Alternative 2. Therefore, the construction of Alternative 2 would require greater encroachment into the surrounding wetland than the Preferred Alternative. Utility infrastructure would be similar to the Preferred Alternative except that Alternative 2 would require a longer extension of the proposed new water line because the location of the new hardened tie-in facility would be further from the existing water service point of connection along Route 18.

2.3.3.3 Tie-In Operations

Tie-in operations associated with Alternative 2 would be the same as for the Preferred Alternative.

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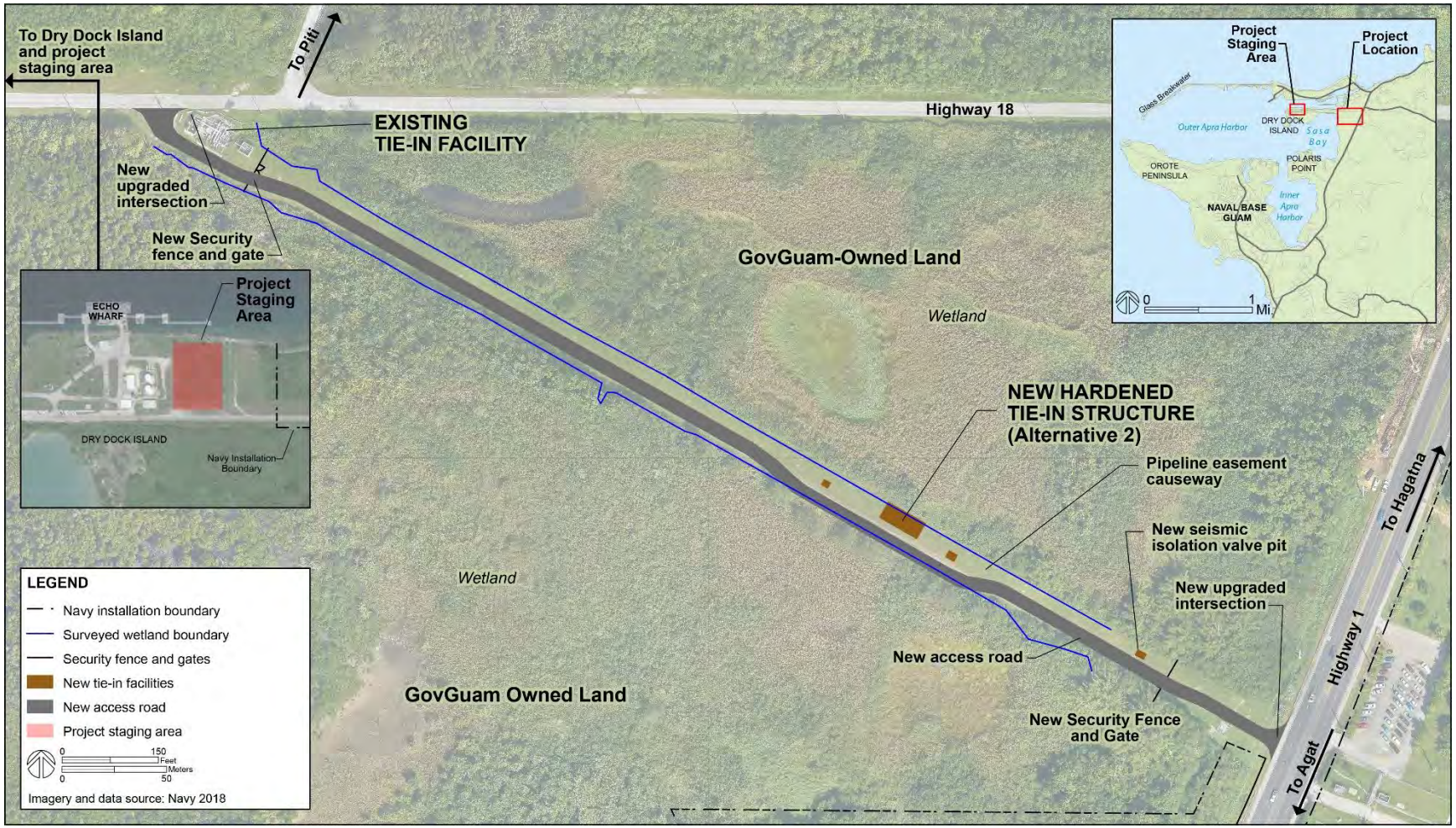

Figure 2-6 Alternative 2 Project Vicinity Map

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2.4 Alternatives Considered but not Carried Forward for Detailed Analysis

The following alternatives were considered, but not carried forward for detailed analysis in this EA as they did not meet the purpose and need for the project or satisfy the reasonable alternative screening factors presented in Section 2.2.

2.4.1 Alternative 3: Relocate Pipelines and Construct a New Hardened Tie-In Facility

The pipelines would be relocated out of the wetland to adjacent roadways (Highway 18 and Highway 1), and the new tie-in would be constructed along the relocated pipelines. This alternative would minimize impacts to the adjacent wetlands, but the new tie-in would still be located along public highways. This alternative was considered but will not be carried forward for detailed analysis in the EA because it does not minimize the visibility of the tie-in facility and would not be compatible with ATFP regulations (screening factors #1 and #4).

2.4.2 Alternative 4: Construct a Hardened Tie-In Structure in Place of the Existing Tie-In

This alternative would demolish the existing tie-in facility and reconstruct a new hardened tie-in facility in its place. The new tie-in would still be located along Highway 18. This alternative was considered but will not be carried forward for detailed analysis in the EA because it does not minimize the visibility of the tie-in facility and would not be compatible with ATFP regulations (screening factors #1 and #4).

2.4.3 Alternative 5: Construct a New Unhardened Tie-In Facility

A new unhardened POL tie-in facility would be constructed along the causeway to replace the existing tie-in. The new facility would enclose four new pipe valve assemblies connecting existing Navy and commercial pipelines. The existing tie-in equipment would be removed, the two existing vaults would be demolished, and the remaining piping would be buried. Since the new tie-in facility would be unhardened, there would be no roof covering the new tie-in equipment. Therefore, it would still be visible. This alternative was considered, but will not be carried forward for detailed analysis in the EA because it does not minimize the overhead visibility, nor would it maximize the physical resilience of the tie-in facility (screening factors #1 and #2).

2.5 Best Management Practices Included in Proposed Action

This section presents an overview of the best management practices (BMPs) that are incorporated into the Proposed Action. BMPs are existing policies, practices, and measures that the Navy would adopt to reduce the environmental impacts of designated activities, functions, or processes. Although BMPs mitigate potential impacts by avoiding, minimizing or reducing/eliminating impacts, BMPs are distinguished from potential mitigation measures because BMPs are (1) existing requirements for the Proposed Action, (2) ongoing, regularly occurring practices, or (3) not unique to this Proposed Action. In other words, the BMPs identified in this document are inherently part of the Proposed Action and are not potential mitigation measures proposed as a function of the NEPA environmental review process for the Proposed Action. Table 2-2 includes a list of BMPs. Mitigation measures are discussed separately in Chapter 3.

BMPs and conservation measures would be implemented in order to avoid and minimize potential environmental impacts, including survey of the project area and radii of concern for Endangered Species Act (ESA) listed species, halting work when protected species are within prescribed safety zones in the work area, and reducing and preventing runoff and dust.

Temporary impacts would occur during the construction phase including increased noise levels, dust, and vehicle/equipment emissions, restricted access and increased construction related traffic both within and around the project area. However, implementation of the Proposed Action is expected to have negligible or less than significant potential impacts to all resource areas. The Proposed Action would be designed to be constructed and operated entirely within the existing impacted area.

Table 2-2 Best Management Practices

BMP	*Description*	*Impacts Reduced/Avoided*
Implement dust control plan	A dust control plan would be implemented during construction and operations in compliance with Guam Air Pollution Control Standards and Regulations. Example BMPs include watering of active work areas, using wind screens, keeping adjacent paved roads clean, covering of open-bodied trucks, limiting the area that is disturbed at any given time and/or mulching or chemically stabilizing inactive areas that have been worked.	Prevents or minimizes fugitive particulate emissions from being transported away from the project area
Erosion control	Compliance with National Pollutant Discharge Elimination System provisions including Storm Water Pollution Prevention Plans; compliance with Section 438 of the Energy Independence and Security Act (i.e., drainage improvements associated with the new facilities would be designed based on the principles of low impact development (LID), and would not increase stormwater runoff from the project site into adjacent areas including the marine environment); erosion and sediment control measures, such as protection of erodible soils; control of storm water runoff from the construction site; use of sediment basins; use of vegetation and mulch on soil exposed by grading; use of silt fencing and barriers around excavated and cleared areas; and fugitive dust control measures.	Prevents or minimizes water quality impacts on receiving waters
Shielded lighting	Use of shielded and Migratory Bird Treaty Act-compliant outdoor lights	To prevent disorientation, disturbance, and/or injury to protected avian species
Management of biological resources	Implement habitat management measures outlined in the JRM Integrated Natural Resources Management Plan	Protect and benefit threatened and endangered species on JRM -controlled lands
Erect temporary fencing	Erecting temporary fencing would ensure that waterbirds present in the adjacent wetland would be deterred from entering construction areas.	Deter waterbirds from entering construction areas.
Construction Vehicle/Equipment Refueling	Fueling of construction vehicles and equipment shall take place at least 50 feet away from the water, preferably over an impervious surface.	Prevent or minimize impacts from potential fuel spills.
Install POL absorbent barrier	An absorbent barrier for oil/petroleum product will be used to contain oil/petroleum waste from the construction site from entering wetland areas along both sides of the existing POL utilities berm.	Prevent or minimize impacts from potential fuel spills.
Pollution prevention plan	A pollution prevention plan for petroleum removal from the existing pipe will be provided for agency review.	Prevent or minimize impacts from potential fuel spills.

Table 2-2 Best Management Practices

BMP	*Description*	*Impacts Reduced/Avoided*
Spill Response Plan	Applicable spill response plans will be sent to the cognizant regulatory agency for review and approval.	Prevent or minimize impacts from potential fuel spills.
Hazardous Waste Management	Handle, transport, dispose of and/or remediate hazardous materials or waste encountered during construction in accordance with applicable federal and State regulations.	Protection of construction workers/community members from any hazardous material encountered during construction.

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3 Affected Environment and Environmental Consequences

This chapter presents a description of the environmental resources and baseline conditions that could be affected from implementing any of the alternatives and an analysis of the potential direct and indirect effects of each alternative.

All potentially relevant environmental resource areas were initially considered for analysis in this EA. In compliance with NEPA, the CEQ, and Department of Navy guidelines; the discussion of the affected environment (i.e., existing conditions) focuses only on those resource areas potentially subject to impacts. Additionally, the level of detail used in describing a resource is commensurate with the anticipated level of potential environmental impact.

"Significantly," as used in NEPA, requires considerations of both context and intensity. Context means that the significance of an action must be analyzed in several contexts such as society as a whole (e.g., human, national), the affected region, the affected interests, and the locality. Significance varies with the setting of a proposed action. For instance, in the case of a site-specific action, significance would usually depend on the effects in the locale rather than in the world as a whole. Both short- and long-term effects are relevant. Intensity refers to the severity or extent of the potential environmental impact, which can be thought of in terms of the potential amount of the likely change. In general, the more sensitive the context, the less intense a potential impact needs to be in order to be considered significant. Likewise, the less sensitive the context, the more intense a potential impact would be expected to be significant.

After a thorough screening analysis, the following resources are analyzed in detail in this EA: Biological Resources, Water Resources, Air Quality, Cultural Resources, Infrastructure, and Hazardous Materials and Wastes.

The potential impacts to the following resource areas are considered to be negligible or non-existent so they were not analyzed in detail in this EA:

Geological Resources: The Proposed Action would have negligible impacts on geological resources because clearing and construction activities would occur on a man-made causeway, include implementation of standard erosion control BMPs and would comply with applicable building standards for seismic risks. Imported fill material will be required for site grading and construction, but it would be checked and approved by the Construction Quality Control Geotechnical Specialist prior to use at the site.

Airspace: Construction and operation of the Proposed Action would not involve impacts to military or civilian airspace or facilities. The proposed project location is not proximal to military or civilian airfield or airspace.

Land Use: The Proposed Action would maintain the existing use of the project area as a causeway for POL infrastructure and would have no impact on surrounding land uses. The Navy has determined that the Proposed Action is consistent to the maximum extent practicable with the enforceable policies of the Guam Coastal Management Plan (GCMP), and submitted a Coastal Zone Management Act (CZMA) consistency determination to the Guam Bureau of Statistics and Plans in a letter dated September 9, 2021. The Navy received GBSP's conditional concurrence on this determination via correspondence dated November 8, 2021. (see Appendix B for CZMA correspondence).

Noise: At its nearest point, the Proposed Action is located approximately 1,200 feet from the nearest noise sensitive receptor, the Guam Veterans Cemetery. Jose Rios Middle School, the next closest noise sensitive receptor is located approximately 1,800 feet from the Proposed Action. At these distances, construction related noise associated with the Proposed Action would be attenuated to permissible levels. Additionally, the noise environment in the vicinity of those noise sensitive receptors is dominated by existing vehicular noise from Route 1 (Marine Corps Drive). The Proposed Action would not generate noise impacts during the operational period.

Visual Resources: The project site is mostly surrounded by dense vegetation, and public views into the causeway are limited to those views gained at the causeway intersection with Highway 1 and Highway 18. The Proposed Action would introduce new security gates and other minor visible features, but these features would not impact any significant view planes or visual resources.

Transportation: Construction activities associated with the Proposed Action would generate short-term increases in traffic in the immediate project vicinity. However, the short-term increase in traffic associated with construction would be minimal and would not exceed roadway capacities.

Public Health and Safety: Potential impacts to public health and safety would be avoided through the implementation of standard BMPs to restrict public access to the construction areas. During the operational period, the security fencing and gates associated with the Proposed Action would prevent public intrusion into the POL causeway and would improve public health and safety. The project area is located in an area with a low (green) probability of encountering munitions and explosives of concern (MEC). Should MEC be encountered at the site, the contractor would stop work and call the MEC construction support provided by unexploded ordnance (UXO) technicians.

Socioeconomics: The Proposed Action would generate short-term, minor beneficial effects on the local economy through increased employment. Because the construction activities would be temporary, there would be insignificant effects on public services and local housing.

Environmental Justice: This EA did not identify any human health, environmental, or other effects by the Proposed Action that would result in disproportionately high or adverse effect on minority or low income-populations in the area.

3.1 Biological Resources

Biological resources include living, native, or naturalized plant and animal species and the habitats within which they occur. Plant associations are referred to generally as vegetation, and animal species are referred to generally as wildlife. Habitat can be defined as the resources and conditions present in an area that support a plant or animal species.

Within this EA, biological resources are divided into four major categories: (1) terrestrial vegetation, (2) terrestrial wildlife, (3) wetlands vegetation, and (4) aquatic wildlife. Threatened, endangered, and other special status species are discussed in their respective categories.

3.1.1 Regulatory Setting

Special-status species, for the purposes of this assessment, are those species listed as threatened or endangered under the Endangered Species Act (ESA), species designated by legislative authority in the Territory of Guam as species that are endangered or threatened, and species afforded federal protection under the Migratory Bird Treaty Act (MBTA).

The purpose of the ESA is to conserve the ecosystems upon which threatened and endangered species depend and to conserve and recover listed species. Section 7 of the ESA requires action proponents to consult with the U.S. Fish and Wildlife Service (USFWS) or National Oceanic and Atmospheric Administration (NOAA) Fisheries to ensure that their actions are not likely to jeopardize the continued existence of federally listed threatened and endangered species, or result in the destruction or adverse modification of designated critical habitat. Critical habitat cannot be designated on any areas owned, controlled, or designated for use by the DoD where an Integrated Natural Resources Management Plan has been developed that, as determined by the Department of Interior or Department of Commerce Secretary, provides a benefit to the species subject to critical habitat designation.

Birds, both migratory and most native-resident bird species, are protected under the MBTA, and their conservation by federal agencies is mandated by EO 13186 (Migratory Bird Conservation). Under the MBTA it is unlawful by any means or in any manner, to pursue, hunt, take, capture, kill, attempt to take, capture, or kill, [or] possess migratory birds or their nests or eggs at any time, unless permitted by regulation. The 2003 National Defense Authorization Act gave the Secretary of the Interior authority to prescribe regulations to exempt the Armed Forces from the incidental taking of migratory birds during authorized military readiness activities. The final rule authorizing the DoD to take migratory birds in such cases includes a requirement that the Armed Forces must confer with the USFWS to develop and implement appropriate conservation measures to minimize or mitigate adverse effects of the proposed action if the action will have a significant negative effect on the sustainability of a population of a migratory bird species.

3.1.2 Affected Environment

The following discussions provide a description of the existing conditions for each of the categories under biological resources for the Navy-Commercial tie-in hardening (MILCON P-661) site and vicinity. Threatened and endangered species are discussed in each respective section below with a composite list applicable to the Proposed Action provided in Table 3-1.

Table 3-1 Threatened and Endangered Species Known to Occur or Potentially Occurring in the Region of Influence (ROI) and Critical Habitat Present in ROI

Common Name	*Scientific Name*	*Federal Listing Status*	*State Listing Status*	*Critical Habitat Present?*
Mariana Common Moorhen; *Pulattat*	*Gallinula chloropus guami*	Endangered	Endangered	No

The Proposed Action is located on the POL causeway, a man-made berm of fill material extending from Highway 1 (Marine Corps Drive) in the vicinity of the Sasa Valley Tank Farm to Highway 18 in the vicinity of the intersection of Highway 18 and Marine Road, Piti, Guam. This causeway supports the subject pipelines (buried within it, except at the existing Navy-commercial tie-in adjacent to Highway 18 where pipes are above ground) and an unpaved access roadway. The berm is higher on the northeast side rising steeply from adjacent, flooded ground to a more-or-less level surface over the pipeline, then sloping gradually downward to the southwest side where it merges into the adjacent flooded ground. On the north side of the berm, the land is a flooded wetland, presumably created from low-lying terrain when the causeway cut off this area from Sasa Bay. On the south side, the land is the tidally flooded flat of inner Sasa Bay. Sasa Bay is marine preserve (National Marine Protected Area; MPA) managed by the

Guam Department of Agriculture. The boundaries of the MPA encompass all of the POL causeway (NOAA, 2009; NOAA, 2017).

The Proposed Action also includes a construction staging area located adjacent to Echo Wharf on Dry Dock Island. This proposed staging area is a level, empty lot and existing vegetation consists of mowed grasses.

3.1.2.1 Terrestrial Vegetation

Vegetation includes terrestrial plants as well as fresh/brackish water aquatic communities and constituent plant species. The plant species present were identified by an exhaustive pedestrian survey of the project area (AECOS, 2019). No previous surveys of this site were located or included in Navy biological survey reports (such as those included in Navy, 2018), presumably because the pipeline was constructed many decades in the past and is on land belonging to the Government of Guam.

The botanical survey of all vascular plants in the project area (*AECOS*, 2019) included noting rough abundance values within each of three environments: 1) the maintained berm, including the buried pipeline and an access roadway, 2) the edges of the berm where maintenance (i.e., mowing and weed-wacking) is not applied or only infrequently applied; and 3) areas for a limited distance (roughly 30 ft or 10 m) beyond the toe of the berm, areas considered to be wetland (Duenas, Camacho & Associates, Inc., 2017) and mostly covered in forest or dense herbaceous growth.

The environment to be impacted most directly by the proposed action is the maintained top of the pipeline berm from the top-of-bank on the northeast face to the maintained edge on the southwest side. The vegetation here is well-maintained: regularly mowed and or weed-wacked, right up to a boundary near the edges of the fill. Minor clearing along the boundary areas keeps herbaceous and shrubby vegetation from encroaching on the maintained area, essentially a lawn of low-growing herbs.

3.1.2.2 Wetland Vegetation

The vegetation off to each side of the berm is mostly relatively dense wet forest, although in a few areas, this vegetation consists of tall grasses—particularly wild cane (*Saccharum spontaneum*) and giant reed (*Arundo donax*)—or a mixture of shrubs and herbaceous plants.

The vegetation at the far western end on the south side of the causeway is a mangrove swamp (mangal) dominated here by native mangal hembra (*Rhizophora mucronata*) with a substratum of otherwise unvegetated mud. This wetland type is mapped in the JRM INRMP as reaching and crossing the causeway in this location (Navy, 2018, Fig. 5-4), but the environment across the causeway is not a mangal, but a freshwater marsh dominated by wild cane. The Sasa Bay mangal is the largest native mangrove community on U.S. lands in the Pacific covering some 146 acres along the eastern shore of Sasa Bay (Navy, 2018), but the recognizable tidal flat (a mangal) is close to the POL causeway only at the far west end (near Highway 18). Further from Highway 18 along the causeway, the ground close off the south side of the berm is not obviously wetland, and merges into a lowland or coastal forest.

3.1.2.3 Terrestrial Wildlife

Terrestrial wildlife includes all animal species (i.e., insects and other invertebrates, freshwater fish, amphibians, reptiles, birds, and mammals) focusing on the species and habitat features of greatest importance or interest. Biological field surveys were conducted of the project area to provide baseline information on natural resources to inform this EA (AECOS, 2019). A listing of all wildlife observed during the biological field surveys is provided in Table 3-2.

Table 3-2 Terrestrial and wetland wildlife observed in the project area (*AECOS*, 2019)

Species	***Common Name***	***Vegetation Type***	***Status***
Insects			
Badamia exclamationis	Brown skipper	Terrestrial	Alien
Taractrocera zicle	Grassdart	Terrestrial	Alien
Papilio polytes	Black citrus swallowtail	Terrestrial	Alien
Eurema blanda	Large grass yellow	Terrestrial	Alien
Euploea eunice	Blue-banded king crow	Terrestrial	Indigenous
Delta pyriforme	Potter wasp	Terrestrial	Alien
Mollusca			
Lissachatina fulica	Giant African snail	Terrestrial	Alien
Amphibians			
Eleutherodactylus planirostris	Greenhouse frog	Terrestrial /Wetland	Alien
Fejervarya cancrivora	crab-eating frog	Terrestrial/Wetland	Alien
Hylarana guentheri	barking frog	Terrestrial/Wetland	Alien
Litoria fallax	Eastern dwarf tree frogs	Terrestrial	Alien
Rhinella marina	Cane toad	Terrestrial/Wetland	Alien
Reptiles			
Lepidodactylus lugubris	mourning gecko	Terrestrial	Indigenous
Emoia caeruleocauda	blue-tailed skink	Terrestrial	Indigenous
Carlia ailanpalai	curious skink	Terrestrial	Alien
Birds			
Francolinus francolinus	Black Francolin	Terrestrial	Alien
Gallus sp.	Domestic Chicken	Terrestrial	Alien
Streptopelia bitourquata	Philippine Turtle-Dove	Terrestrial	Alien
Gallinula chloropus guami	Mariana Common Moorhen; Pulattat	Wetland	Endemic
Pluvialis fulva	Pacific Golden-Plover	Terrestrial	Indigenous
Numenius phaeopus variegatus	Whimbrel	Terrestrial/Wetland	Indigenous
Sterna hirundo	Common Tern	Terrestrial/Wetland	Indigenous
Ixobrychus sinensis	Yellow Bittern	Terrestrial /Wetland	Alien
Egretta sacra	Pacific Reef-Heron	Terrestrial /Wetland	Indigenous
Dicurus macrocercus	Black Drongo	Terrestrial /Wetland	Alien
Passer montanus	Eurasian Tree Sparrow	Terrestrial	Alien

Status Definitions:
Alien – Introduced to the Mariana Islands by humans
Endemic – Native species only found in the Mariana Islands
Indigenous – Native species also found elsewhere naturally

In addition to providing general information on natural resources potentially impacted by the Proposed Action, the surveys focused on establishing either presence or absence of specific listed (threatened, endangered, or proposed for listing) species, including: Mariana Common Moorhen (*Gallinula chloropus guami*), Mariana fruit bat (*Pteropus mariannus),* and Guam native tree snails (Family Partulidae).

Partulid Tree Snails

Three species of partulid tree snails—humped tree snail (*Partula gibba*), Guam tree snail (*Partula radiolata*), and fragile tree snail (*Samoana fragilis*)—are listed as endangered species (USFWS, 1994). A survey of the vegetation along the berm was made for tree snails. Although the endangered tree snails were the intended focus of the survey, all snails located at preselected sampling stations were documented. The only snails observed at any of the 42 quadrats were shells of the Giant African snail (*Lissachatina fulica*). An abundance of black ants was noted at many of the stations, especially where pago (*Hibiscus tiliaceus*) was the dominant tree. The presence of tree snails in such situations is not likely due to predation by black ants.

Germane to the presence/absence of Guam tree snails is the flora present in each of the survey quadrats. Broad experience with conducting surveys for tree snails on Guam led Fiedler (2019) to classify flora into categories representing levels of likelihood to support partulid snails. The plants observed in the transects have been assigned by Fiedler to one of four "levels of association" (in decreasing order of likelihood to support tree snails) and are so listed in Table 3-3. The table provides a percentage of occurrence (presence) in the quadrats.

Table 3-3 Fiedler vegetation/partulid snail association: listing of plants identified in the project area (*AECOS*, 2019).

Fiedler Level	*Species arranged by level of partulid association*	*Percent occurrence†*
Level 1	*Leucaena leucocephala*	76%
	*Hibiscus tiliaceus **	57%
	Bambusa vulgaris	10%
	Cocos nucifera	10%
	Carica papaya	2%
	*Pandanus tectorius**	2%
	Chromolaena oderata	2%
Level 2	*Spathodea companulata*	24%
	Micania scandens	17%
	Pluchea indica	12%
	Tabebuea pentaphylla	5%
	Inocarous fagifer	2%
	*Tournefortia argentea**	2%
	Mutingia calabura	2%
Level 3	*Arundo donax*	57%
	*Saccharum spontaneum**	50%
	*Casuarina equisetifolia **	7%
	*Rhizophora mucronata**	2%

* - A native (indigenous or endemic) plant species on Guam.

† - percentage of quadrats containing the plant species out of 42 quadrats.

Birds

Five 15-minute time-dependent waterbird counts were conducted along the berm, with stations spaced equidistant from each other along the length of the survey area. Given the paucity of avian species and numbers currently existing on Guam due to the widespread presence of (and predation pressure from) the non-native brown tree snake (*Boiga irregularis*), all other birds detected were documented in the counts. These surveys were repeated on two successive days.

A total of 96 individual birds of 11 species, representing nine separate families, were recorded during station counts (Table 3-2). Five of the species recorded are native resident species, one of which, the Mariana subspecies of the Common Moorhen (*Gallinula chloropus guami*) is listed as endangered under both the federal and the Government of Guam endangered species statutes. Two species, Yellow Bittern (*Ixobrychus sinensis*) and Pacific Reef-Heron (*Egretta sacra*), are indigenous resident breeding species. Additionally, three other species recorded: Pacific Golden-Plover (*Pluvialis fulva*), Whimbrel (*Numenius phaeopus variegatus*), and Common Tern (*Sterna hirundo*), are migratory indigenous species protected under the federal Migratory Bird Treaty Act. The remaining five species are established alien species, introduced by humans.

Mariana Common Moorhen were heard from all five of the waterbird count stations. Calls were heard emanating only from the wetlands north of the pipeline berm. Distances between the count stations and the heard birds varied from approximately 30 to 160 ft from the toe of the pipeline berm. The vegetation off the north side of the berm is dense making it difficult to accurately determine distances to calling birds or make visual sightings. One can assume that Moorhen occur within a few meters of the berm and along its entire length on a seasonal and/or temporal basis.

Overall, avian diversity and densities were low.

Fruit Bats

Vegetation along the berm margins was searched for roosting or feeding *fanihi* or Marianna Fruit bat. Field observations were made with the aid of Leica 8 X 42 binoculars and by listening for vocalizations. No fruit bats were observed during the survey (AECOS, 2019).

3.1.3 Environmental Consequences

This analysis focuses on wildlife or vegetation types that are important to the function of the ecosystem or are protected under federal or state law or statute.

3.1.3.1 No Action Alternative

Under the No Action Alternative, the Proposed Action would not occur and there would be no change to biological resources. Therefore, no significant impacts to biological resources would occur with implementation of the No Action Alternative.

3.1.3.2 New Hardened Tie-In Facility (Alternative 1- Preferred Alternative) Potential Impacts

The study area for the analysis of effects to biological resources associated with Alternative 1 (the Preferred Alternative) includes:

- The approximately 2,000 foot-long POL causeway between Route 1 and Route 18 and the adjacent wetland areas.
- The 20,000 square foot construction staging area located approximately one mile west of the project site on Navy land adjacent to Echo Wharf.

Terrestrial Vegetation

No plants of any conservation concern or plants listed as threatened or endangered by either the federal government or the government of Guam are present in either the POL causeway or contractor staging areas (AECOS, 2019). During the construction period, existing vegetation within the POL causeway and the construction staging area are likely to be damaged and/or removed due to ground disturbance.

However, existing vegetation at both locations is characterized by mowed grasses and weeds. Once construction is completed, all damaged or removed vegetation would be revegetated to prevent erosion and stormwater runoff.

In the long-term, the Proposed Action would result in a net loss of vegetated area because the proposed paved access road is wider than the existing unpaved access road. As noted above, this does not represent a significant impact because the existing vegetation consists of maintained grasses and weeds. The increase in impervious surface would generate additional stormwater runoff, but the access road would be designed so that runoff is directed to vegetated swales along the roadside to prevent erosion and promote infiltration and pollutant removal.

Wetland Vegetation

No plants of any conservation concern or plants listed as threatened or endangered by either the federal government or the government of Guam are present in the wetland areas located within approximately 30 feet of the POL causeway (AECOS, 2019). The vast majority of construction work would be located on the POL causeway and outside of the wetland boundary. However, approximately 3,200 square feet (0.07 acres) of wetland vegetation along the edges of the causeway would be permanently cleared and grubbed. Vegetation clearing is required to provide space to stabilize the causeway bank during the construction phase of the proposed project, and is also required for the installation of drainage swales along the north edge of the POL causeway.

In the short-term, the clearing of wetland vegetation has the potential to increase sedimentation and runoff to adjacent wetland areas. However, BMPs would be established as part of the National Pollutant Discharge Elimination System (NPDES) permit and the 401 Water Quality Certification to ensure that those potential impacts are avoided and/or minimized. In the long-term, the clearing would result in the permanent loss of approximately 3,200 square feet (0.07 acres) of wetland vegetation. However, this would have a less than significant impact because it represents only a small fraction of the wetland area in Sasa Bay, cleared vegetation would be a mix of common native and non-native ruderal species, and there are no plant species of any conservation concern in the vicinity of the proposed project's construction footprint.

Terrestrial Wildlife

No wildlife of any conservation concern or wildlife listed as threatened or endangered by either the federal government or the government of Guam are present on the POL causeway (AECOS 2019). The sole listed species that potentially could occur within the terrestrial habitat being affected by the proposed action is the endangered Mariana Common Moorhen (discussed in the following section).

The noise and human activity associated with construction of the Preferred Alternative would temporarily displace wildlife from the project area and adjacent areas. Additionally, the clearing of wetland vegetation and placement of fill material would preclude wildlife from residing within the new building's constructed extents. However, the wildlife species are expected to use suitable nearby habitat for foraging, sheltering, and breeding. Displacement of these individuals from the project footprint and adjacent areas would not be expected to affect the survival of individuals or populations. In the long-term, the use and function of habitat surrounding the POL causeway and the Navy-Commercial tie-in would be similar to current baseline conditions. Significant impacts to wildlife populations are not expected as a result.

Threatened and Endangered Species

The only currently listed or proposed for listing species recorded within or adjacent to the survey sites is the endangered Mariana Common Moorhen (*Gallinula chloropus guami*). The Mariana Common Moorhen was federally listed as an endangered in 1984 (USFWS, 2009). The recovery plan for the Mariana Common Moorhen was finalized in 1991 (USFWS, 1991) and a five-year status review was completed in 2009 (USFWS, 2009). No critical habitat has been designated for this species. It is likely that this species nests in the wetland to the north of the POL causeway. Potential impacts to trust resources can be minimized to the maximum extent practicable by avoiding adjacent wetlands, minimizing entry into wetlands, and ensuring that wetland associated species, such as the Mariana Common Moorhen, are not severely impacted by the enhancements to the pipeline.

Biological surveys for Guam tree snails, waterbirds, Mariana fruit bat, and botanical species were conducted on October 2 and October 4, 2019. Five waterbird survey stations were established along the length of the berm, equidistant from each other. Stations were surveyed for 15-minutes to observe waterbirds or listen to vocalizations. Field surveys were conducted for two consecutive days starting at 6:00 a.m. and ending between 09:30 a.m. and 11:00 a.m. Moorhens were heard from all five waterbird count stations originating only from the wetland north of the berm. Estimated distance of moorhen vocalizations varied between 10 to 50 meters from the toe of the berm. Vegetation on the north side of the berm was very dense making it difficult to judge the distance of calling birds, or make a visual sighting. During tree snail surveys, a running count of moorhen vocalizations was made as well. At least three individuals of the species were heard calling from the wetland area north of the berm. Guam tree snail, Mariana fruit bat, and botanical surveys did not detect any other protected species (AECOS, 2019).

The Preferred Alternative would have construction equipment and excavated areas next to the wetland. Dewatering basins would also be constructed to hold excavated material and drain excess water. However, these holding areas could have standing water for sustained periods of time thus unintentionally attract moorhens to the construction site. This situation could create an attractive nuisance that could lead to accidental harm to moorhens.

Because moorhens could potentially become entrapped in excavated areas, construction materials, or harmed by construction equipment operating in the construction footprint, along construction right-of-way, or utilities berm, the Navy shall monitor for moorhens and implement the following avoidance and minimization measures for the duration of the construction phase (i.e. vegetation clearing, grading/grubbing, excavation, utilities placement, building construction, post-construction grading, etc.) of the Preferred Alternative:

1. The U.S. Fish and Wildlife Service (USFWS) shall be notified prior to project initiation and provided with the results of preconstruction waterbird surveys.
2. The contractor shall have a biological monitor on site for the duration of construction to ensure protected wildlife will be avoided during the construction phase of the project.
3. The biological monitor shall provide all on-site construction contractor personnel with a fact sheet containing color photographs of potential threatened or endangered species in the action area, and a number to call if a sighting occurs. The biological monitor will keep track of contractors on site, potential Threatened and Endangered species sightings, and make weekly reports to NAVFAC Marianas.

4. If a severe weather event occurs (i.e., typhoon) that could potentially disperse wildlife to the area, surveys will be conducted prior to resuming construction. If moorhens are present in the project area, work shall immediately cease to prevent disturbance, and the USFWS shall be contacted for further guidance.
5. A biological monitor will conduct surveys for moorhen adults, juveniles, and nests at the project site prior to project initiation. Repeat surveys again within 3 days of project initiation and after any subsequent delay of work of 3 or more days.
6. If a moorhen nest and/or brood is present, construction activities will immediately cease and the USFWS contacted for further guidance.
7. A 100-foot (30 meter) buffer will be established and maintained around all active moorhen nests and/or broods until the chicks have fledged. No potentially disruptive activities or habitat alteration should occur within this buffer. A biological monitor(s) will be present on the project site during all construction or earth moving activities to ensure that individual moorhens and their nests are not adversely impacted.
8. If a moorhen is observed within the project site, or flies into the site while activities are occurring, the biological monitor shall halt all activities within 100 feet (30 meters) of the individual(s). Work will not resume until the listed waterbird(s) leave the area on their own accord.
9. Temporary fencing (can be silt fence comprised of standard plastic or geotech dust fencing material between three and six feet high) shall be erected around construction sites to deter moorhens from entering. Silt fences will also be used around excavated and cleared sites for erosion control. The toe of the fence shall be weighted or buried so that moorhens cannot get under the fence.
10. No pre-construction vegetation clearing, grubbing, groundwork, or commencement of construction activities that may impact the wetland areas during the peak Mariana moorhen nesting season (July to November)
11. A post-construction report will be submitted to the Service with 30 days of the completion of the project. The report will include the results of the moorhen surveys, the location and outcome of documented nests, and any other relevant information.

Because moorhens have been observed in areas adjacent to the work site: 1) construction work will be halted or postponed should moorhen ingress into the project area during the construction phase; 2) construction workers will be instructed not to harm or harass the species; 3) work will be halted if the bird is present within a 100 feet of the worksite; 4) a barrier to oil spills and a fence will be installed to deter birds from entering the work site; and 5) further cooperation with USFWS on specific spill mitigation and prevention methods will be done to minimize impacts. Implementation of these avoidance and minimization measures would ensure that impacts to the species are discountable. Accordingly, the Navy determined that the Preferred Alternative may affect, but is not likely to adversely affect (NLAA) the Mariana Common Moorhen pursuant to section 7 of the Endangered Species Act of 1973 [16 U.S.C. 1531-1544 *et seq*.] in a letter to the USFWS dated September 17, 2020. The USFWS concurred with the Navy's NLAA determination in a return letter dated November 19, 2020 (see Appendix A).

Three migratory bird species that are protected under the Migratory Bird Treaty Act (MBTA) were recorded during biological survey (AECOS, 2019): the Pacific Golden-Plover (*Pluvialis fulva*), the Asiatic

subspecies of Whimbrel (*Numenius phaeopus variegatus*), and Common Tern (*Sterna hirundo*). All three of these species could potentially loaf or forage within the proposed construction footprint. However, as none of these species are presently found to nest on Guam, disturbance from construction and operation activities would not incur significant negative impacts on MBTA-protected species.

Potential impacts from the proposed project would be discrete and mostly localized to an area that has been previously disturbed, and artificially maintained, as a utilities right-of-way for decades. Although some wetland habitat would be permanently lost as the result of constructing a new POL tie-in building, the 0.07-acre impact would not affect the hydrologic function of the surrounding wetlands, nor would it preclude continued biological function of surrounding wetland habitat. Moreover, impacts to sensitive species would be avoided and minimized to the maximum extent practicable. Other species extant to the proposed project area are well-represented in the surrounding environment. Both short- and long-term effects of the proposed action would not contribute significantly to adverse change in the existing environmental baseline. Therefore, implementation of the Preferred Alternative would not result in significant impacts to biological resources.

3.1.3.3 New Hardened Tie-In Facility at an Alternative Easement Location (Alternative 2) Potential Impacts

The study area for Alternative 2 would be the same as for the Preferred Alternative. Alternative 2 is expected to have similar non-significant impacts to biological resources as the Preferred Alternative. The primary difference is that the proposed Tie-In Facility for Alternative 2 would be located to the southeast along the POL causeway. Therefore, Alternative 2 would result in slightly more clearing of wetland vegetation because the wetland boundary is narrower in this location. The clearing would result in the permanent loss of approximately 7,400 square feet (0.17 acres) of wetland vegetation. Still, the area of wetland vegetation clearing represents only a small fraction of the wetland area in Sasa Bay, and there are no plant species of any conservation concern. The same avoidance and minimization measures would be implemented as in the Preferred Alternative to mitigate potential construction impacts to the Mariana Common Moorhen.

Therefore, implementation of this Alternative 2 would not result in significant impacts to biological resources.

3.2 Water Resources

This discussion of water resources includes marine waters, wetlands, and floodplains. Wildlife and vegetation are addressed in Section 3.1, Biological Resources.

Marine waters would typically include estuaries, waters seaward of the historic height of tidal influence, and offshore high salinity waters. Marine water quality would be described as the chemical and physical composition of the water as affected by natural conditions and human activities. Additionally, marine waters may include an area within a National Marine Sanctuary requiring an action proponent to avoid adverse water quality impacts in order to prevent damage to resources within the sanctuary.

Wetlands are jointly defined by the U.S. Environmental Protection Agency (USEPA) and U.S. Army Corps of Engineers (USACE) as “those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.” Wetlands generally include “swamps, marshes, bogs and similar areas.”

Floodplains are areas of low-level ground present along rivers, stream channels, large wetlands, or coastal waters. Floodplain ecosystem functions include natural moderation of floods, flood storage and conveyance, groundwater recharge, and nutrient cycling. Floodplains also help to maintain water quality and are often home to a diverse array of plants and animals. In their natural vegetated state, floodplains slow the rate at which the incoming overland flow reaches the main water body. Floodplain boundaries are most often defined in terms of frequency of inundation, that is, the 100-year and 500-year flood. Floodplain delineation maps are produced by the Federal Emergency Management Agency and provide a basis for comparing the locale of the Proposed Action to the floodplains.

3.2.1 Regulatory Setting

The Clean Water Act (CWA) establishes federal limits, through the National Pollutant Discharge Elimination System (NPDES) program, on the amounts of specific pollutants that can be discharged into surface waters to restore and maintain the chemical, physical, and biological integrity of the water. The NPDES program regulates the discharge of point (i.e., end of pipe) and nonpoint sources (i.e., stormwater) of water pollution.

The Guam NPDES stormwater program requires construction site operators engaged in clearing, grading, and excavating activities that disturb one acre or more to obtain coverage under an NPDES Construction General Permit for stormwater discharges. Construction or demolition that necessitates an individual permit also requires preparation of a Notice of Intent to discharge stormwater and a Stormwater Pollution Prevention Plan (SWPPP) that is implemented during construction. As part of the 2010 Final Rule for the CWA, titled *Effluent Limitations Guidelines and Standards for the Construction and Development Point Source Category*, activities covered by this permit must implement non-numeric erosion and sediment controls and pollution prevention measures.

Wetlands are currently regulated by the USACE under Section 404 of the CWA as a subset of all "Waters of the United States." Waters of the United States are defined as (1) traditional navigable waters, (2) wetlands adjacent to navigable waters, (3) nonnavigable tributaries of traditional navigable waters that are relatively permanent where the tributaries typically flow perennially or have continuous flow at least seasonally (e.g., typically 3 months), and (4) wetlands that directly abut such tributaries under Section 404 of the CWA, as amended, and are regulated by USEPA and the USACE. The CWA requires that Guam establish a Section 303(d) list to identify impaired waters and establish TMDLs for the sources causing the impairment.

Section 404 of the CWA authorizes the Secretary of the Army, acting through the Chief of Engineers, to issue permits for the discharge of dredge or fill into wetlands and other Waters of the United States. Any discharge of dredge or fill into Waters of the United States requires a permit from the USACE.

Section 438 of the Energy Independence and Security Act establishes storm water design requirements for development and redevelopment projects. Under these requirements, federal facility projects larger than 5,000 sq ft must "maintain or restore, to the maximum extent technically feasible, the predevelopment hydrology of the property with regard to the temperature, rate, volume, and duration of flow."

The Coastal Zone Management Act of 1972 (CZMA) provides assistance to states, in cooperation with federal and local agencies, for developing land and water use programs in coastal zones. Actions occurring within the coastal zone commonly have several resource areas that may be relevant to the CZMA. The entire island of Guam has been designated a "coastal zone" under the CZMA. The CZMA

requires that all construction and operational activities be consistent, to the maximum extent practicable, with the Guam Coastal Management Program (GCMP) policies to guide the use, protection, and development of land and ocean resources within Guam's coastal zone (Guam Bureau of Statistics and Plans [GBSP], 2011).

EO 11990, *Protection of Wetlands,* requires that federal agencies adopt a policy to avoid, to the extent possible, long- and short-term adverse impacts associated with destruction and modification of wetlands and to avoid the direct and indirect support of new construction in wetlands whenever there is a practicable alternative.

EO 11988, *Floodplain Management*, requires federal agencies to avoid to the extent possible the long- and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development unless it is the only practicable alternative. Flood potential of a site is usually determined by the 100-year floodplain, which is defined as the area that has a one percent chance of inundation by a flood event in a given year.

3.2.2 Affected Environment

The following discussions provide a description of the existing conditions for each of the categories under water quality resources in the vicinity of the Proposed Action.

3.2.2.1 Marine Waters

The POL causeway was constructed on the tidal flats of Sasa Bay. On the north side of the berm, the land is a flooded wetland, presumably created from low-lying terrain when the causeway cut off this area from Sasa Bay. On the south side, the land is the tidally flooded flat of inner Sasa Bay. The Sasa Bay Marine Preserve is recognized as a U.S. Marine Protected Area (MPA), and is managed by the Guam Department of Agriculture. The boundaries of the MPA encompass all of the POL causeway (NOAA, 2009; NOAA, 2017).

Guam Water Quality Standards (GWQS), adopted by The Guam Environmental Protection Agency (GEPA) in 2001, establish three categories of waters: groundwater, marine waters, and surface waters. Marine waters are further divided into three sub-categories: Excellent (M-1), Good (M-2) and Fair (M-3). The waters within Apra Harbor—including Sasa Bay—are designated M-2. According to the GWQS, water in the M-2 category must be of sufficient quality to allow for the propagation and survival of marine organisms, particularly shellfish and other similarly harvested aquatic organisms, corals and other reef related resources, and whole body contact recreation. Other important and intended uses include mariculture activities, aesthetic enjoyment and related activities.

From December 2014 to September 2016, water quality sensors were deployed at three locations within Apra Harbor including one at Anchor Reef which is located at the mouth of Sasa Bay. Episodes of heavy rainfall lowered salinity levels at all three monitoring sites, but salinity levels at Anchor Reef were the most variable (Schils et al., 2017). As a result of weak circulation and substantial sediment transport into the marine environment from the watershed, turbidity throughout Apra Harbor is higher than outside the harbor. Additionally, however, harbor turbidity is variable, ranging from clear conditions on the western extent near the mouth to highly turbid conditions in Sasa Bay. Also, compared to conditions around the rest of Guam nutrient values (i.e., phosphate, chlorophyll, nitrite, and silicate) were higher inside Apra Harbor (Navy, 2018).

3.2.2.2 Wetlands

The POL causeway is located within the Sasa Bay Marine Preserve. The causeway itself is dry because it was constructed of fill on top of the existing tidal flats; however, it is bordered on both sides by wetlands. These wetlands are part of the larger 146-acre Sasa Bay estuarine wetlands that extend along the eastern shore of Sasa Bay from Dry Dock Island to Polaris Point, and on the east side of Marine Corps Drive (Navy, 2018). A Wetland Delineation was completed to establish the boundaries of the wetlands (Duenas, Camacho & Associates, Inc., 2017). Figure 2-1 through 2-5 show the location of the wetland boundaries in relation to the proposed improvements.

To the south of the POL causeway at the northwest end of the site, the wetland encompasses an estuarine community of mangroves (E2SS3N) that is dominated by stilted mangrove (*Rhizophora stylosa*), gray mangrove (*Avicennia marina var. alba*), and Indian camphorweed (*Pluchea indica*). Further east-southeast along the causeway, the wetland transitions into a palustrine emergent community (PEM1F) with the obligate (OBL) tropical reed karisso (*Phragmites karka*) as the main constituent. Ruderal vegetation, such as wedelia (*Sphagneticola trilobata*) and wild cane grass (*Saccharum spontaneum*), lines the maintained open lawn and access road fronting the wetlands; many of these are facultative (FAC) wetland species that intermingle with the wetland vegetation.

To the north of the POL causeway, Tropical reeds or karisso (*Phragmites karka*) dominate the wetland as a palustrine emergent marsh (PEM1F), especially at the northwestern end. Pago or sea hibiscus (Talipariti tiliaceum), an aggressive facultative wetland (FACW) tree, is the major component of the palustrine wetland community (PFO3C) at the southeastern end of the project site. Indian camphorweed (*Pluchea indica*) and the giant wetland fern *Acrostichum aureum* were also observed along the northern edge of the pipeline.

3.2.2.3 Floodplains

Flood Insurance Rate Maps for the project area (Federal Emergency Management Agency [FEMA], 2007) indicate that the entire pipeline causeway is located within Zone A, Special Flood Hazard Areas Subject to Inundation by the 1% Annual Chance Flood, No Base Flood Elevations determined (see Figure 3-1). The construction staging area adjacent to Echo Wharf is located within Zone X, Areas determined to be outside the 0.2% annual chance floodplain.

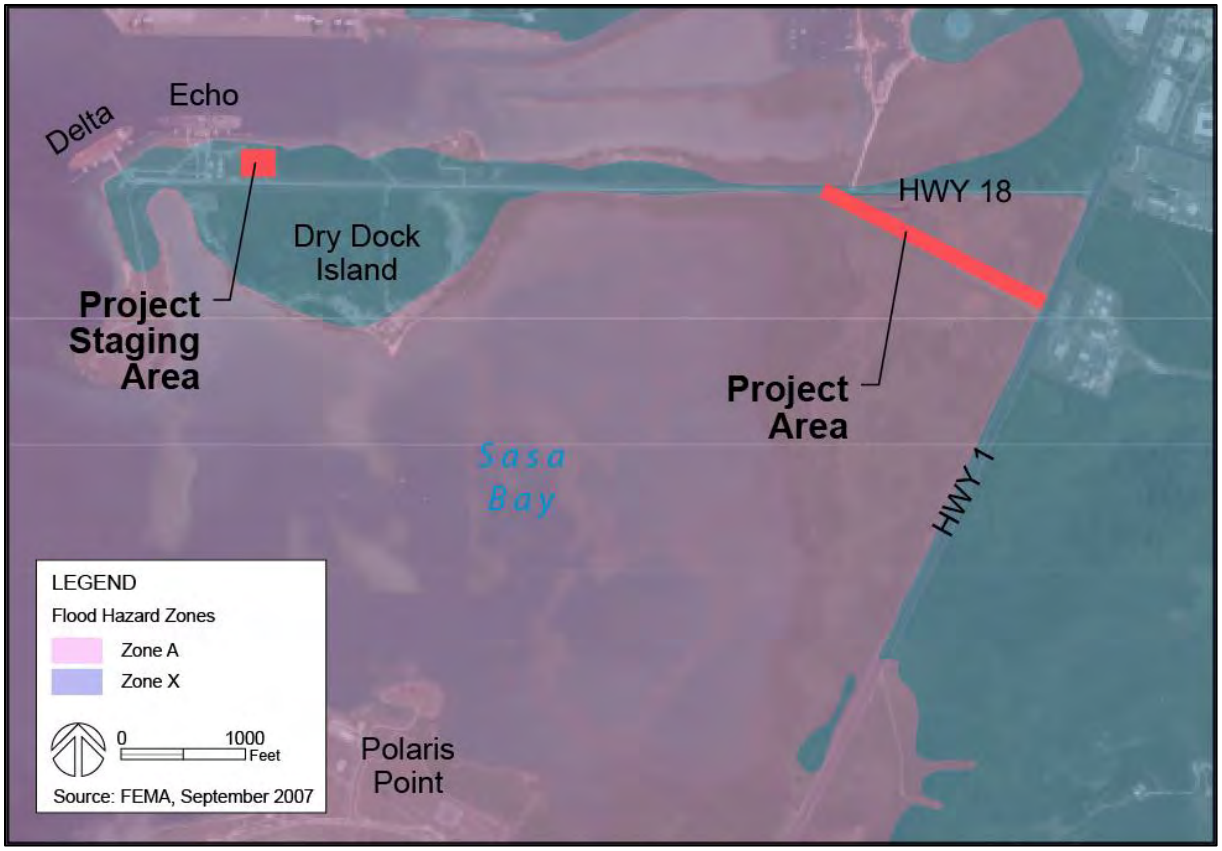

Figure 3-1 Flood Hazard Zones

3.2.3 Environmental Consequences

In this EA, the analysis of water resources looks at the potential impacts on marine waters, wetlands, and floodplains. Marine waters analysis includes potential changes to physical and chemical characteristics. The impact assessment of wetlands considers the potential for impacts that may change the local hydrology, soils, or vegetation that support a wetland. The analysis of floodplains considers if any new construction is proposed within a floodplain or may impede the functions of floodplains in conveying floodwaters.

3.2.3.1 No Action Alternative

Under the No Action Alternative, the Proposed Action would not occur and there would be no change to baseline water resources. Therefore, no significant impacts to water resources would occur with implementation of the No Action Alternative.

3.2.3.2 Construct a New Hardened Tie-In Facility (Alternative 1- Preferred Alternative) Potential Impacts

The study area for the analysis of effects to water resources associated with the Preferred Alternative includes Sasa Bay, the wetlands adjacent to the project site.

Marine Waters and Wetlands

The Preferred Alternative is located on a POL causeway within the Sasa Bay Marine Preserve. The POL causeway itself is dry land, but it is flanked on both sides by wetland. The vast majority of ground

disturbance and construction activities would take place on the man-made POL causeway, but there would be approximately 3,200 square feet (0.07 acres) of permanent wetland loss associated with construction of the Preferred Alternative. This construction activity has the potential to result in temporary impacts such as sediments or pollutants being transported into the adjacent wetlands and receiving marine waters of Sasa Bay. This potential would be minimized by the implementation of the erosion control BMPs listed in Table 2-2. Because more than one-acre of land is anticipated to be disturbed for construction, an NPDES permit would be required for the construction activities, including the development of a SWPPP. Additionally, a CWA Section 401 water quality certification and section 404 nationwide permit would be required because the project includes construction activities within the wetland. Conditions of the NPDES and CWA permits would be complied with to further reduce the potential for construction period project-related sediments and/or pollutants to be transported to receiving wetlands and marine waters.

In the long-term, there would be no change in the scope or intensity of maintenance and operations efforts for the tie-in facility. In compliance with Section 438 of the Energy Independence and Security Act (EISA), drainage improvements associated with the new facilities would be designed based on the principles of low impact development (LID), and would not increase stormwater runoff from the project site into adjacent areas including the marine environment. The proposed new paved access road would result in an increase in impervious surface that would generate additional stormwater runoff. However, following LID principles, the access road would be designed so that runoff is directed to vegetated swales along the roadside to prevent erosion and promote infiltration and pollutant removal (thereby meeting the requirements of EISA).

Due to the remote potential for POL spills, the following conservation measures have been added to preserve the physical, chemical, and biological integrity of wetland waters of the United States:

1. An absorbent barrier for oil/petroleum product will be used to contain oil/petroleum waste from the construction site from entering wetland areas along both sides of the existing POL utilities berm.
2. A pollution prevention plan for petroleum removal from the existing pipe will be provided for agency review. A commonly used method for cleaning out petroleum waste from a POL pipeline is to “pig” the line. This method uses a plug (or “pig”) of non-absorbent material that, under pressure, would push the remaining petroleum sludge within the pipe to the other end before plugging. At either end of the close off valve, a containment barrier will be established and any material caught will be disposed of at a designated disposal facility.
3. Applicable spill response plans will be sent to the cognizant regulatory agency for review and approval.
4. The EA was made available for agency review during the public review period.

Floodplains

The Preferred Alternative is located almost entirely within the Zone A, Special Flood Hazard Areas Subject to Inundation by the 1% Annual Chance Flood, No Base Flood Elevations determined. In accordance with Guam Floodplain Management Ordinance of 2000 and National Flood Insurance Program Floodplain Management Guidelines, the finished floor elevation of the proposed hardened tie-in structure has been designed at two feet above the highest adjacent grade.

Due to its location within the floodplain, the proposed action is subject to EO 11988 which requires that federal agencies follow a prescribed decision-making process that includes consideration of alternatives

to avoid adverse effects and incompatible development in floodplains; minimization of potential harm to or within the floodplain through design or action modifications; and public notification. Specifically, an eight-step decision-making process is required to help agencies evaluate projects that have potential impacts to or within the floodplain and how the impacts can be avoided or minimized. The eight steps are summarized below.

1. Determine if a proposed action is in the base floodplain.
2. Conduct early public review, including public notice.
3. Identify and evaluate practicable alternatives to locating in the base floodplain, including alternative sites outside of the floodplain.
4. Identify impacts of the proposed action.
5. If impacts cannot be avoided, develop measures to minimize the impacts and restore and preserve the floodplain, as appropriate.
6. Reevaluate alternatives.
7. Present the findings and a public explanation.
8. Implement the action.

The EO 11988 eight-step decision-making process was conducted for the Preferred Alternative. The Draft EA and publication of the notice of its availability served as Step 2 of the process. No public comments were received pertaining to the proposed development in the floodplain. Steps 3 through 7 are documented below.

Alternatives to the Preferred Alternative were evaluated to determine if they were practicable, including alternative sites, alternative actions, and no action. The existing Navy-Commercial tie-in is also located within Zone A, so no action would still leave the facility vulnerable to flooding. Relocation of the pipelines outside of the wetlands and the associated floodplain was considered as an alternative. The pipelines would be relocated to adjacent roadways (Highway 18 and Highway 1), and the new tie-in would be constructed along the relocated pipelines. Relocation of the pipelines would minimize impacts to the adjacent wetlands and relocate the tie-in facility outside of the floodplain, but the new tie-in would still be located along public highways and would therefore not be compatible with ATFP regulations. Therefore, relocation of the pipelines was determined not to be practicable.

The Preferred Alternative would involve the construction of a new hardened POL tie-in structure within the floodplain, but it would replace an existing POL tie-in facility that is already within the floodplain and no alternative locations outside of the floodplain were determined to be feasible. The Preferred Alternative would not result in adverse direct or indirect effects to the floodplain and no modifications are needed to minimize impacts on the existing floodplain. In accordance with GBSP's letter of concurrence for the CZMA consistency determination (see Appendix B), the Navy will comply with Guam's standards for Flood Hazard Area Management (18 Guam Administrative Rules Chapter 3 Article 4).

As Step 6 in the eight-step decision-making process, the Navy reevaluated the Preferred Alternative and found that it is still practicable and unlikely to adversely impact floodplain hazards or significantly disrupt floodplain values. This Final EA and publication of the notice of its availability serve as Step 7 in the EO 11988 eight-step decision making process.

Therefore, implementation of the Preferred Alternative would not result in significant impacts to water resources.

3.2.3.3 New Hardened Tie-In Facility at an Alternative Easement Location (Alternative 2) Potential Impacts

The study area for Alternative 2 would be the same as for the Preferred Alternative.

Marine Waters and Wetlands

Alternative 2 is expected to have similar non-significant impacts to marine waters and wetlands as the Preferred Alternative. The difference is that the proposed Tie-In Facility for Alternative 2 would be located to the southeast along the POL causeway. Therefore, Alternative 2 would result in slightly more construction work (i.e., clearing and grubbing) within the adjacent wetlands because the wetland boundary is narrower in this location. The construction of Alternative 2 would result in the permanent loss of approximately 7,400 square feet (0.17 acres) of wetland. Still, the erosion control BMPs listed in Table 2-2 would be implemented and the project would comply with conditions of the NPDES and CWA permits to further reduce the potential for construction period impacts. This includes the same conservation measures as identified in the Preferred Alternative to avoid and minimize impacts from the remote potential for POL spills.

In the-long term, there would be no change in the scope or intensity of maintenance and operations efforts for the tie-in facility. As in the Preferred Alternative, Alternative 2 would be constructed in compliance with EISA and LID principles to prevent erosion and promote infiltration and pollutant removal.

Floodplains

Alternative 2 would involve the construction of a new hardened POL tie-in structure within the floodplain, but it would replace an existing POL tie-in facility that is already within the floodplain and no alternative locations outside of the floodplain were determined to be feasible. Alternative2 would not result in adverse direct or indirect effects to the floodplain and no modifications are needed to minimize impacts on the existing floodplain.

Therefore, implementation of Alternative 2 would not result in significant impacts to water resources.

3.3 Air Quality

This discussion of air quality includes criteria pollutants, standards, sources, permitting, and greenhouse gases. Air quality in a given location is defined by the concentration of various pollutants in the atmosphere. A region's air quality is influenced by many factors, including the type and amount of pollutants emitted into the atmosphere, the size and topography of the air basin, and the meteorological conditions.

Most air pollutants originate from human-made sources, including mobile sources (e.g., cars, trucks, buses) and stationary sources (e.g., factories, refineries, power plants), as well as indoor sources (e.g., some building materials and cleaning solvents). Air pollutants are also released from natural sources such as volcanic eruptions and forest fires.

3.3.1 Regulatory Setting

3.3.1.1 Criteria Pollutants and National Ambient Air Quality Standards

The principal pollutants defining the air quality, called "criteria pollutants," include carbon monoxide (CO), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), ozone, suspended particulate matter less than or equal to 10 microns in diameter (PM_{10}), fine particulate matter less than or equal to 2.5 microns in diameter ($PM_{2.5}$), and lead (Pb). CO, SO_2, Pb, NO_2, and some particulates are emitted directly into the atmosphere from emissions sources. Ozone, NO_2, and some particulates are formed through atmospheric chemical reactions that are influenced by weather, ultraviolet light, and other atmospheric processes.

Under the Clean Air Act (CAA), the USEPA has established National Ambient Air Quality Standards (NAAQS) (40 CFR part 50) for these criteria pollutants. NAAQS are classified as primary or secondary. Primary standards protect against adverse health effects; secondary standards protect against welfare effects, such as damage to farm crops and vegetation and damage to buildings. Some pollutants have long-term and short-term standards. Short-term standards are designed to protect against acute, or short-term, health effects, while long-term standards were established to protect against chronic health effects.

Areas that are and have historically been in compliance with the NAAQS are designated as attainment areas. Areas that violate a federal air quality standard are designated as nonattainment areas. Areas that have transitioned from nonattainment to attainment are designated as maintenance areas and are required to adhere to maintenance plans to ensure continued attainment.

The CAA requires states to develop a general plan to attain and maintain the NAAQS in all areas of the country and a specific plan to attain the standards for each area designated nonattainment for a NAAQS. These plans, known as State Implementation Plans (SIPs), are developed by state and local air quality management agencies and submitted to USEPA for approval.

3.3.1.2 Guam Ambient Air Quality Standards

The Territory of Guam regulates ambient air quality standards (AAQS) defined in Title 22-1, Article 3 of the Guam Administrative Rules. Guam standards have been established for SO_2, particulate matter, CO, ozone, NO_2, and Pb. The Guam AAQS are given in terms of primary standards, which define levels of air quality necessary "with an adequate margin of safety, to protect the public health" and secondary standards, which define levels of air quality necessary "to protect the public welfare from any known or anticipated adverse effects of a pollutant."

3.3.1.3 Mobile Sources

Hazardous air pollutants (HAPs) emitted from mobile sources are called Mobile Source Air Toxics (MSAT). MSAT are compounds emitted from motor vehicles that are known or suspected to cause cancer or other serious health and environmental effects. In 2001, USEPA issued its first MSAT Rule, which identified 201 compounds as being HAPs that require regulation. A subset of six of the MSAT compounds was identified as having the greatest influence on health and included benzene, butadiene, formaldehyde, acrolein, acetaldehyde, and diesel particulate matter. More recently, USEPA issued a second MSAT Rule in February 2007, which generally supported the findings in the first rule and provided additional recommendations of compounds having the greatest impact on health. The rule also identified several engine emission certification standards that must be implemented (40 CFR parts 59,

80, 85, and 86; Federal Register Volume 72, No. 37, pp. 8427–8570, 2007). Unlike the criteria pollutants, there are no NAAQS for benzene and other HAPs. The primary control methodologies for these pollutants for mobile sources involves reducing their content in fuel and altering the engine operating characteristics to reduce the volume of pollutant generated during combustion.

3.3.1.4 General Conformity

The USEPA General Conformity Rule applies to federal actions occurring in nonattainment or maintenance areas when the total direct and indirect emissions of nonattainment pollutants (or their precursors) exceed specified thresholds. The emissions thresholds that trigger requirements for a conformity analysis are called *de minimis* levels. *De minimis* levels (in tons per year [TPY]) vary by pollutant and also depend on the severity of the nonattainment status for the air quality management area in question.

A conformity applicability analysis is the first step of a conformity evaluation and assesses if a federal action must be supported by a conformity determination. This is typically done by quantifying applicable direct and indirect emissions that are projected to result due to implementation of the federal action. Indirect emissions are those emissions caused by the federal action and originating in the region of interest, but which can occur at a later time or in a different location from the action itself and are reasonably foreseeable. The federal agency can control and will maintain control over the indirect action due to a continuing program responsibility of the federal agency. Reasonably foreseeable emissions are projected future direct and indirect emissions that are identified at the time the conformity evaluation is performed. The location of such emissions is known and the emissions are quantifiable, as described and documented by the federal agency based on its own information and after reviewing any information presented to the federal agency. If the results of the applicability analysis indicate that the total emissions would not exceed the de minimis emissions thresholds, then the conformity evaluation process is completed.

3.3.1.5 Permitting

New Source Review (Pre-Construction Permit)

New stationary sources and modifications at existing stationary sources are required by the CAA to obtain an air pollution permit before commencing construction. This permitting process for stationary sources is called New Source Review and is required whether the source or modification is planned for nonattainment areas or attainment and unclassifiable areas. Because no new and no modifications to existing stationary sources are associated with the Proposed Action, permitting is not carried forward as part of the air quality analysis.

3.3.1.6 Greenhouse Gases

Greenhouse gases (GHGs) are gas emissions that trap heat in the atmosphere. These emissions occur from natural processes and human activities. Scientific evidence indicates a trend of increasing global temperature over the past century due to an increase in GHG emissions from human activities. The climate change associated with this global warming is predicted to produce negative economic and social consequences across the globe.

USEPA issued the Final *Mandatory Reporting of Greenhouse Gases Rule* on September 22, 2009. GHGs covered under the Final *Mandatory Reporting of Greenhouse Gases Rule* are carbon dioxide (CO_2), methane, nitrogen oxide (NO_x), hydrofluorocarbons, perfluorocarbons, sulfur hexafluoride, and other

fluorinated gases including nitrogen trifluoride and hydrofluorinated ethers. Each GHG is assigned a global warming potential. The global warming potential is the ability of a gas or aerosol to trap heat in the atmosphere. The global warming potential rating system is standardized to CO_2, which has a value of one. The equivalent CO_2 rate is calculated by multiplying the emissions of each GHG by its global warming potential and adding the results together to produce a single, combined emissions rate representing all GHGs. Under the rule, suppliers of fossil fuels or industrial GHGs, manufacturers of mobile sources and engines, and facilities that emit 25,000 metric tons or more per year of GHG emissions as carbon dioxide equivalent (CO_2e) are required to submit annual reports to USEPA.

Pursuant to EO 13990, Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis, CEQ rescinded its 2019 Draft NEPA Guidance on Consideration of Greenhouse Gas Emissions and is reviewing, for revision and update, the 2016 Final Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in National Environmental Policy Act Reviews. Under the 2016 guidance, federal agencies should consider, "(1) The potential effects of a proposed action on climate change as indicated by assessing GHG emissions (e.g., to include, where applicable, carbon sequestration); and, (2) The effects of climate change on a proposed action and its environmental impacts (CEQ, 2016)."

In an effort to reduce energy consumption, reduce GHGs, reduce dependence on petroleum, and increase the use of renewable energy resources the Navy has implemented a number of renewable energy projects. Examples of Navy-wide GHG reduction projects include energy efficient construction, thermal and photovoltaic solar systems, geothermal power plants, and the generation of electricity with wind energy. The Navy continues to promote and install new renewable energy projects.

3.3.2 Affected Environment

As seen in Figure 3-1, the Preferred Alternative is located within both the 1971 Piti SO_2 and 2010 Piti-Cabras SO_2 NAAQS nonattainment areas as designated by the USEPA. The existing tie-in facility does not include any stationary emissions sources. Short-term, temporarily-emitted air emissions (e.g., fugitive dust, combustion of fossil fuels) are generated by vehicles accessing the site for maintenance of the tie-in facility and pipelines. Ambient air quality conditions at the Proposed Action project are primarily affected by major stationary power plants at Piti Point.

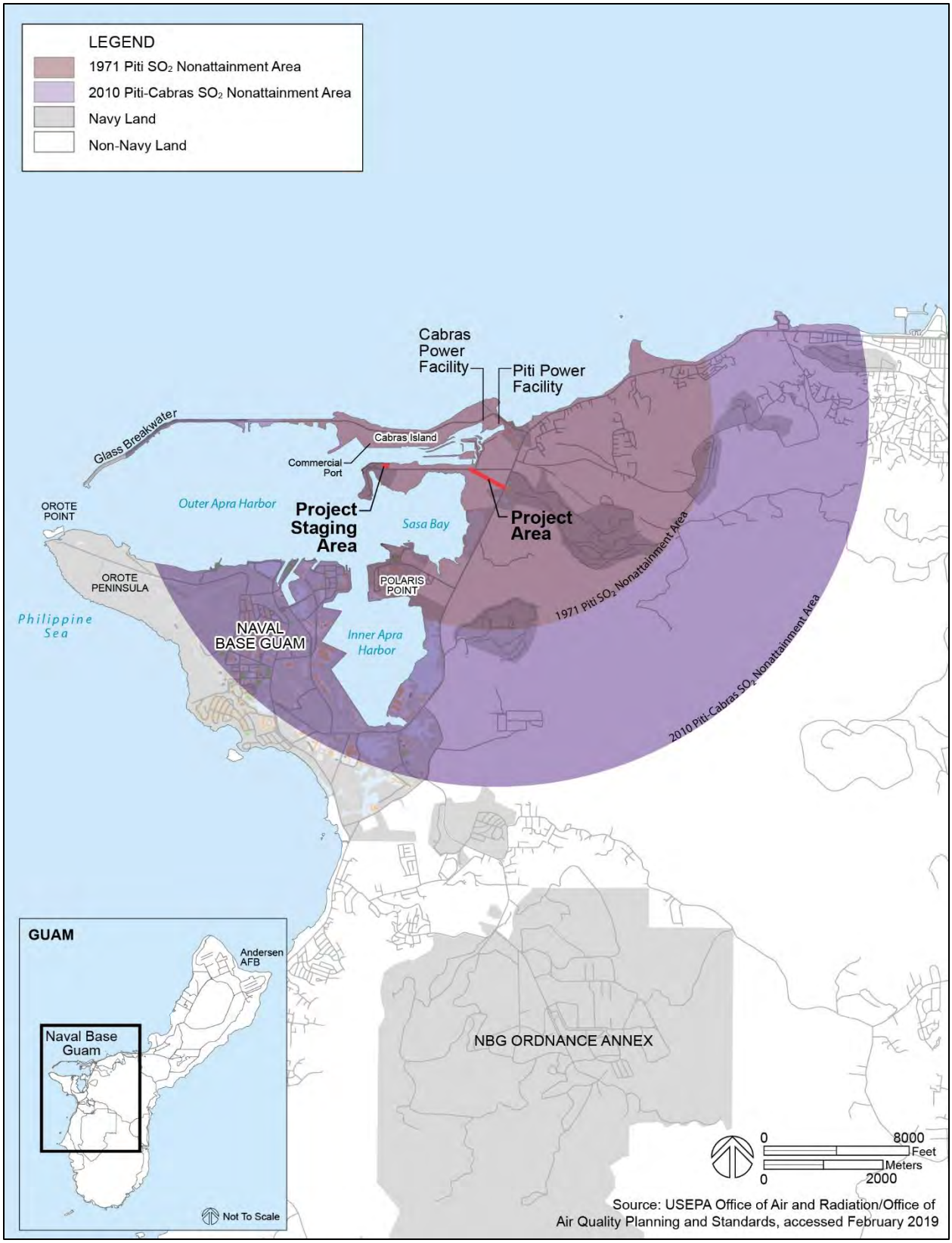

Figure 3-2 Clean Air Act SO_2 Nonattainment Area

3.3.2.1 Piti Point

There are several stationary emission sources in the vicinity of the project area, including the Guam Power Authority (GPA) Cabras Power Plant in the Piti Point area with two, 66-megawatt (MW) steam turbines and two, slow speed 39.3-MW diesel generators. In the same area, the Taiwan Electrical and Mechanical Engineering Services Power Plant operates a 40-MW combustion turbine known as Piti #7, and the Marianas Energy Company Power Plant operates two, slow speed diesel generators, each rated at 44-MW (also known as Piti #8 and #9). Piti Power Plant also has two units, #4 and #5, previously operated by GPA, but currently not in operation. It should be noted that in 2015 an explosion took two of the four Cabras plant turbines offline. The GPA is currently in the process of building a new 180-MW baseload power plant near the Dededo-Harmon substation that will replace the Cabras plant and include an additional 130-MW from planned solar photovoltaic farms. In 2017, GPA also activated decommissioned Dededo Combustion Turbines 1 and 2 (40 MW) to help offset the 78.6-MW of base load capacity lost by the 2015 explosion (GPA, 2019).

An emission inventory of the island of Guam is not available; the USEPA National Emission Inventory does not include Guam. USEPA's Technical Support Document for Intended Round 3 Area Designations for the 2010 1-Hour SO_2 Primary NAAQS for Guam reported 2011-2013 actual SO_2 emissions for Cabras (8,891 tons per year), Marianas Energy Company (4,828 tons per year), and TEMES (2 tons per year), which can be used as a reference point for assessing potential impacts from the proposed alternatives.

3.3.3 Environmental Consequences

Effects on air quality are based on estimated direct and indirect emissions associated with the action alternatives, and the dispersion and transport of those emissions. The ROI for assessing air quality impacts is within the air basin in which the project is located, mainly in the immediate vicinity of construction activities. Potential impacts to air quality are evaluated with respect to the extent, context, and intensity of the impact in relation to relevant regulations, guidelines, and scientific documentation.

3.3.3.1 No Action Alternative

Under the No Action Alternative, the Proposed Action would not occur and there would be no change to baseline air quality. Therefore, no significant impacts to air quality or air resources would occur with implementation of the No Action Alternative.

3.3.3.2 Construct a New Hardened Tie-In Facility (Alternative 1- Preferred Alternative) Potential Impacts

The Preferred Alternative would not introduce any new permanent stationary sources of air emissions. Short-term, temporarily-emitted air emissions (e.g., fugitive dust, combustion of fossil fuels) would be generated during the construction period. BMPs would be implemented to minimize fugitive dust during construction. Example BMPs include watering of active work areas, using wind screens, keeping adjacent paved roads clean, covering of open-bodied trucks, limiting the area that is disturbed at any given time and/or mulching or chemically stabilizing inactive areas that have been worked. Construction emissions, released from the tailpipes of on-road and nonroad mobile sources or are fugitive emissions, lack plume rise. Thus, air emissions are expected to initially disperse in the immediate vicinity of construction activities and then transported downwind of release. Observations at the Guam International Airport indicate wind directions are mostly from the east, which would transport emissions away from public areas most of the time. Transport of air emissions to public areas would be infrequent and when they

occur, air pollutant concentrations are expected to be low, commensurate with the low quantities of emissions (Appendix C).

During the operational period, emissions would be limited to those generated from routine operations and maintenance activities. These activities would continue at the same intensity as the pre-construction period. However, implementation of the Preferred Alternative would upgrade the existing dirt access road to a paved road which is expected to reduce fugitive dust emissions from vehicle access. Therefore, an improvement in air quality is expected from the Preferred Alternative during the operational period.

General Conformity

The 1990 amendments to the CAA require federal agencies to ensure that their actions conform to the SIP in a nonattainment area. As the Proposed Action would potentially involve SO_2 emitting activities in the 1971 Piti SO_2 and 2010 Piti-Cabras SO_2 nonattainment areas (see Figure 3-2), the General Conformity Rule applies to the proposed activities within the nonattainment area. Therefore, a subsequent general conformity applicability analysis is required.

The *de minimis* level established by USEPA applicable to the 1971 Piti SO_2 and 2010 Piti-Cabras SO_2 non-attainment areas on Guam, is 100 TPY of SO_2. If the total direct and indirect emissions of a pollutant are above the *de minimis* level, a formal general conformity determination is required for that pollutant. The net increase in SO_2 emissions with potential to emit from the proposed action within the SO_2 nonattainment area was predicted for operational and construction activities with potential air pollutant emissions (see Appendix C for calculations). Annual SO_2 emissions from the Preferred Alternative would not exceed the *de minimis* criterion of 100 TPY of SO_2 in the 1971 Piti SO_2 and 2010 Piti-Cabras SO_2 nonattainment areas and a formal conformity determination is not required. A Record of Non-Applicability (RONA) is provided in Appendix D.

Greenhouse Gases

Implementation of the Preferred Alternative would contribute directly to emissions of GHGs from the combustion of fossil fuels. Demolition, construction, and clearing activities would generate approximately 160.31 tons of CO_2e during 2022, approximately 350.40 tons of CO_2e during 2023, and approximately 146.76 tons of CO_2e during 2024. During the operational period, GHG emissions would be limited to those generated from routine operations and maintenance activities. These activities would continue at the same intensity as the pre-construction period. Therefore, no increase in GHG emissions is expected from the Preferred Alternative during the operational period. These estimated annual GHG emissions fall below the CEQ threshold of 25,000 metric tons. This limited amount of emissions would not likely contribute to global warming to any discernible extent.

Therefore, implementation of the Preferred Alternative would not result in significant impacts to air quality.

3.3.3.3 New Hardened Tie-In Facility at an Alternative Easement Location (Alternative 2) Potential Impacts

Potential Impacts

Alternative 2 would have similar, non-significant impacts as the Preferred Alternative because it would utilize the same construction equipment and methods, and have the same construction duration. The difference is that the proposed Tie-In Facility for Alternative 2 would be located further from the project

staging area than the Preferred Alternative. This additional distance would result in greater emissions for construction tasks associated with the new tie-in facility. However, this increase in emissions would be relatively small compared to the total emissions generated during construction, and it would not exceed the *de minimis* criterion of 100 TPY of SO_2 in the 1971 Piti SO_2 and 2010 Piti-Cabras SO_2 nonattainment areas.

Therefore, implementation of this action alternative would not result in significant impacts to air quality.

3.4 Cultural Resources

This discussion of cultural resources includes prehistoric and historic archaeological sites; historic buildings, structures, and districts; and physical entities and human-made or natural features important to a culture, a subculture, or a community for traditional, religious, or other reasons. Cultural resources can be divided into three major categories:

- Archaeological resources (prehistoric and historic) are locations where human activity measurably altered the earth or left deposits of physical remains.
- Architectural resources include standing buildings, structures, landscapes, and other built-environment resources of historic or aesthetic significance.
- Traditional cultural properties may include archaeological resources, structures, neighborhoods, prominent topographic features, habitat, plants, animals, and minerals essential for the preservation of traditional culture.

3.4.1 Regulatory Setting

Cultural resources are governed by other federal laws and regulations, including the National Historic Preservation Act (NHPA), Archeological and Historic Preservation Act, American Indian Religious Freedom Act, Archaeological Resources Protection Act of 1979, and the Native American Graves Protection and Repatriation Act of 1990. Federal agencies' responsibility for protecting historic properties is defined primarily by sections 106 and 110 of the NHPA. Section 106 requires federal agencies to take into account the effects of their undertakings on historic properties. Section 110 of the NHPA requires federal agencies to establish—in conjunction with the Secretary of the Interior—historic preservation programs for the identification, evaluation, and protection of historic properties. Cultural resources also may be covered by state, local, and territorial laws.

3.4.2 Affected Environment

Cultural resources listed in the National Register of Historic Places (NRHP) or eligible for listing in the NRHP are "historic properties" as defined by the NHPA. The list was established under the NHPA and is administered by the National Park Service on behalf of the Secretary of the Interior. The NRHP includes properties on public and private land. Properties can be determined eligible for listing in the NRHP by the Secretary of the Interior or by a federal agency official with concurrence from the applicable State Historic Preservation Office (SHPO). A NRHP-eligible property has the same protections as a property listed in the NRHP. The historical properties include archaeological and architectural resources.

The Navy has conducted inventories of cultural resources within the vicinity of the current undertaking at the Apra Harbor portion of Naval Base Guam to identify historical properties that are listed or potentially eligible for listing in the NRHP (Craft 2014; DeFant, 2013; Dixon et al., 1999, 2011; Mason Architects and Weitze Research, 2010; Reinman, 1995). Additional projects have been completed in the

vicinity for other federal and local government agencies (Carrell 1991; Hunter-Anderson 2002; Price 1972; Wells et al. 1995).

The area of potential effect (APE) for cultural resources is the geographic area or areas within which an undertaking (project, activity, program or practice) may cause changes in the character or use of any historic properties present. The APE is influenced by the scale and nature of the undertaking and may be different for various kinds of effects caused by the undertaking. For this Proposed Action, the Navy determined that the APE includes 3.9 acres and includes the approximately 2,000 foot-long POL causeway between Route 1 and Route 18 and the 20,000 square foot construction staging area located approximately one mile west of the project site on Navy land adjacent to Echo Wharf.

3.4.2.1 Archaeological Resources

No archaeological resources are known within the APE. The pipeline causeway was constructed of limestone fill on top of the tidal basin and was completed in 1951. Since the pipeline causeway is constructed of fill, no archaeological resources are expected to be present. The construction staging area adjacent to Echo Wharf is also located on fill land. The NBG Integrated Cultural Resources Management Plan (ICRMP) identifies the archaeological sensitivity of the land at the Delta and Echo Fuel Piers as, "None – Fill or Dredged Area" (Navy, 2015). The closest archaeological resource to the APE is Guam Historic Properties Inventory (GHPI) Site 66-03-0137 (Reinman 1995), which is presumed to have originally been within meters of the eastern end of the APE (Table 3-4). The site consisted of an eight- or ten-stone latte set and lusong. Vandals stole two capstones and attempted to remove two uprights in 1993 (Reinman 1995:14), and per Welch (2009:81), the remaining stones were subsequently relocated to the grounds fronting the government buildings at Adelup. Associated archaeological deposits are assumed to be present at the original location of the latte. Welch (2009) indicates that Site 66-03-0137 is eligible for listing on the National Register of Historic Places. The site location was not recorded with a high-precision global positioning unit, and the current plotting is approximate. Hunter-Anderson (2002) reports human burials and archaeological deposits beneath Route 1 (no GHPI site number reported), which bounds the APE at its southeastern end; however, the exact locations of these finds are not reported so their proximity to the APE is uncertain. All other known archaeological resources in the vicinity of the APE are approximately 790-4,300 ft distant.

Table 3-4 Previously Recorded Archaeological Sites Adjacent to the APE

Site 66-03-	*Type*	*Function & Affiliation*	*Description*	*NRHP Eligibility*	*References*
0137	Latte set	Habitation/ Latte Period	Single eight- or ten-stone latte set with an associated lusong approximately 160 ft to the north; in April 1993 two latte capstones were stolen and looters excavation pits were dug around two uprights. Welch (2009:81) states that the remaining stones were subsequently removed to the grounds fronting the government buildings in Adelupe.	Yes	Reinman (1995); Welch (2009)

3.4.2.2 Architectural Resources

The only existing structure within the APE is the existing Navy/Commercial Tie-in facility located at the intersection of Route 18 and the POL causeway. This facility (BP-661 Vault) consists of an open pipeline valve yard with partially enclosed structures at the east and west ends. It was evaluated and determined to be not eligible for inclusion in the NRHP (Reed 2018).

3.4.2.3 Traditional Cultural Properties

National Register Bulletin 38 defines a traditional cultural property as "…one that is eligible for inclusion in the National Register because of its association with cultural practices or beliefs of a living community that (a) are rooted in that community's history, and (b) are important in maintaining the continuing cultural identity of the community" (Parker and King, 1998). A traditional cultural property (TCP) study for Guam was conducted in 2009, which included interviews, existing information on archaeological sites, ethnographic associations, and Chamorro myths (Griffin et al., 2009 in NAVFAC Marianas, 2015). The study is considered preliminary in scope and additional research and consultation would be required to further define and evaluate the potential TCPs identified therein. No traditional cultural properties were identified within or near the APE.

3.4.3 Environmental Consequences

Analysis of potential impacts to cultural resources considers both direct and indirect impacts. Direct impacts may be the result of physically altering, damaging, or destroying all or part of a resource, altering characteristics of the surrounding environment that contribute to the importance of the resource, introducing visual, atmospheric, or audible elements that are out of character for the period the resource represents (thereby altering the setting), or neglecting the resource to the extent that it deteriorates or is destroyed.

3.4.3.1 No Action Alternative

Under the No Action Alternative, the Proposed Action would not occur and there would be no change to cultural resources. Therefore, no significant impacts to cultural resources would occur with implementation of the No Action Alternative.

3.4.3.2 Construct a New Hardened Tie-In Facility (Alternative 1- Preferred Alternative) Potential Impacts

The APE for the analysis of effects to cultural resources associated with the Preferred Alternative includes:

- The approximately 2,000 foot-long POL causeway between Route 1 and Route 18.
- The 20,000 square foot construction staging area located approximately one mile west of the project site on Navy land adjacent to Echo Wharf.

Both the POL causeway and the construction staging area are located on fill lands, and no archaeological resources are expected to be present. GHPI site 66-03-0137 (Reinman 1995) is located adjacent to the eastern end of the POL causeway (near Route 1). However, ground disturbance associated with the Preferred Alternative in this area would be limited to the extents of the commercial and Navy POL easements that would have been previously disturbed during the installation of the pipelines. Therefore, no impacts to archaeological resources are expected.

No architectural resources that are eligible or potentially eligible for the NRHP are located within or nearby the project APE. The existing Navy-commercial tie-in facility (BP-661 Vault) would be demolished, but it was determined to be ineligible for inclusion in the NRHP (Reed 2018). There have been no TCPs identified within or near the APE.

In July 2008, the Commander, Navy Region Marianas entered into a Programmatic Agreement (PA) with the Advisory Council on Historic Preservation and the Guam Historic Preservation Officer regarding Navy undertakings on Guam. Per Stipulation VII.A of the PA, the Preferred Alternative was reviewed by Navy Personnel meeting the requirements under Stipulation II.A or II.B and they determined that the undertaking is located in an area identified as having a low probability for archaeological resources, and that it does not have the potential to cause effects to historic properties. Therefore, no further review under the PA or Section 106 of the NHPA is required.

Therefore, implementation of the Preferred Alternative would not result in significant impacts to cultural resources.

3.4.3.3 New Hardened Tie-In Facility at an Alternative Easement Location (Alternative 2) Potential Impacts

The APE for Alternative 2 would be the same as for the Preferred Alternative, and Alternative 2 is expected to have the same non-significant impacts to cultural resources as the Preferred Alternative.

Therefore, implementation of this Alternative 2 would not result in significant impacts to cultural resources.

3.5 Infrastructure

This section discusses infrastructure such as utilities (including drinking water production, storage, and distribution; wastewater collection treatment and disposal; storm water management, solid waste management, energy production, transmission, and distribution; and communications).

3.5.1 Regulatory Setting

EO 14057 directs federal agencies to meet statutory requirements related to energy and environmental performance of executive departments and agencies in a manner that increases efficiency, optimizes performance, eliminates unnecessary use of resources, and protects the environment. In implementing this policy, each agency shall prioritize actions that reduce waste, cut costs, enhance the resilience of federal infrastructure and operations, and enable more effective accomplishment of its mission. Specifically, federal agencies are required to—among other goals—achieve annual reductions in building energy use, implement energy efficiency measures, reduce water consumption, achieve energy, water, building modernization, and infrastructure goals, apply energy efficiency and sustainable design principles to new construction and major renovations, implement waste prevention and recycling measures, and track these reductions and report their performance.

Chief of Naval Operation Instruction 4100.5E outlines the Secretary of the Navy's vision for shore energy management. The focus of this instruction is establishing the energy goals and implementing strategy to achieve energy efficiency.

Anti-Terrorism Force Protection Standards have been adopted by the DoD through Instruction number 2000.16 of October 2006. The standards require all DoD Components to adopt and adhere to common

criteria and minimum construction standards to mitigate anti-terrorism vulnerabilities and terrorist threats.

3.5.2 Affected Environment

The following discussions provide a description of the existing conditions for each of the categories under infrastructure serving the project area.

3.5.2.1 Utilities

Potable Water

Potable water at NBG is supplied by the Fena Water Treatment Plant (WTP). Primary water supply sources for the Navy's island wide water system are located in the southern region of Guam and include Almagosa Springs, Bona Springs, and the Fena Reservoir surface water impoundment. Water from these three sources is treated at the Fena WTP and is transmitted through a network of storage tanks, transmission lines, and booster pump stations.

The Navy water transmission system is interconnected with the Guam Waterworks Authority (GWA) water distribution system at numerous locations throughout the island, allowing the transfer of water between the two systems. This interconnection allows the Navy system to supply water to GWA and it provides emergency service capability. The point of connection for potable water service for the Proposed Action would be at an existing Navy waterline along Route 18.

Wastewater

The Apra Harbor wastewater collection and treatment system is Navy owned and operated. It is a secondary treatment plant that services NBG, Apra Heights, and Naval Munitions Site. There is an existing wastewater collection, handling, and transport (CHT) line that runs the entire length of the POL causeway. No wastewater service is proposed for the new hardened tie-in facility.

Stormwater

The POL pipeline causeway currently consists of a grass covered berm and an adjacent unpaved access road. No stormwater management infrastructure is currently provided at the project site.

Energy

NBG obtains electricity from GPA's Piti Power Plant, located approximately 3 miles north of the Main Gate (approximately 1,800 feet north of the project site). The electrical distribution system in the project area is comprised of overhead lines running along both Route 1 and Route 18. The DoD-owned Orote Power Plant located near Victor Wharf and provides backup power for Apra Harbor wharves and Polaris Point. It has a rated and actual capacity of 19.8 MW. Other facilities across NBG are equipped with backup generators for uninterrupted power supply in case of power outages.

The POL causeway houses both Navy and commercial POL pipelines served by fuel piers and storage facilities located in the Apra Harbor vicinity. The commercial POL pipelines supply POL for energy production at GPA's Piti Power Plant.

Communications

The two main providers of telecommunication services (i.e., telephone, television, and fiber optics) at Apra Harbor are GTA Teleguam and MCV Broadband, and most of the telephone and televisions lines are routed on overhead transmission lines (Navy, 2015).

3.5.3 Environmental Consequences

This section analyzes the magnitude of anticipated increases or decreases in public works infrastructure demands considering historic levels, existing management practices, and storage capacity, and evaluates potential impacts to public works infrastructure associated with implementation of the alternatives. Impacts are evaluated by whether they would result in the use of a substantial proportion of the remaining system capacity, reach or exceed the current capacity of the system, or require development of facilities and sources beyond those existing or currently planned.

3.5.3.1 No Action Alternative

Under the No Action Alternative, the Proposed Action would not occur and there would be no change to the existing utilities of facilities infrastructure. Therefore, no significant impacts to infrastructure would occur with implementation of the No Action Alternative.

3.5.3.2 Construct a New Hardened Tie-In Facility (Preferred Alternative) Potential Impacts

The study area for the Preferred Alternative includes the utility infrastructure affected by the implementation of the Preferred Alternative.

Utilities

During the construction period, the Preferred Alternative is not likely to impact existing water, electrical, or communications utility service. The Preferred Alternative includes the construction of a new paved access road along the length of the POL causeway. The access road would be constructed so that stormwater runoff drains to adjacent vegetated swales. The Preferred Alternative does involve the relocation of the existing wastewater CHT line that runs the length of the POL causeway. However, the Navy would minimize any potential impacts to the operations of the wastewater CHT line by installing a temporary bypass if necessary.

The Proposed Action would involve work on both the Navy and commercial POL pipelines and tie-ins. However, the construction would be phased so that the new tie-in structure and piping is installed prior to demolition of the existing facility. Therefore, the Navy would be able to minimize disruptions to POL service, and any potential disruptions to POL service would be coordinated with the owner of the commercial pipelines (TriStar) to ensure that there would be no impact to energy generation at the Piti Power Plant.

Non-hazardous construction and demolition waste that cannot be recycled would be disposed off-site at an approved sanitary landfill. As a contractual requirement, the construction contractor would prepare a solid waste management plan that specifies where the construction solid waste or debris will be disposed of or recycled.

The Preferred Alternative would not result in the direct creation or elimination of jobs in the region during the operational period. No increase in personnel at NBG or population change in the regional area is anticipated as a result of the Preferred Alternative and overall demand would not change for wastewater service. The Preferred Alternative would include electrical, water, and communications service, but any potential increase in demand on these utility systems would be negligible.

Therefore, implementation of the Preferred Alternative would not result in significant impacts to infrastructure.

3.5.3.3 New Hardened Tie-In Facility at an Alternative Easement Location (Alternative 2) Potential Impacts

Impacts to infrastructure from Alternative 2 would be the same as from the Preferred Alternative.

Therefore, implementation of this action alternative would not result in significant impacts to infrastructure.

3.6 Hazardous Materials and Wastes

This section discusses hazardous materials, hazardous waste, toxic substances, and contaminated sites.

3.6.1 Regulatory Setting

Hazardous materials are defined by 49 CFR section 171.8 as "hazardous substances, hazardous wastes, marine pollutants, elevated temperature materials, materials designated as hazardous in the Hazardous Materials Table, and materials that meet the defining criteria for hazard classes and divisions in 49 CFR part 173." Transportation of hazardous materials is regulated by the U.S. Department of Transportation regulations.

Hazardous wastes are defined by the Resource Conservation and Recovery Act, as amended by the Hazardous and Solid Waste Amendments, as: "a solid waste, or combination of solid wastes, which because of its quantity, concentration, or physical, chemical, or infectious characteristics may (A) cause, or significantly contribute to, an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness; or (B) pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed." Certain types of hazardous wastes are subject to special management provisions intended to ease the management burden and facilitate the recycling of such materials. These are called universal wastes and their associated regulatory requirements are specified in 40 CFR part 273. Four types of waste are currently covered under the universal wastes regulations: hazardous waste batteries, hazardous waste pesticides that are either recalled or collected in waste pesticide collection programs, hazardous waste thermostats, and hazardous waste lamps, such as fluorescent light bulbs.

Special hazards are those substances that might pose a risk to human health and are addressed separately from other hazardous substances. Special hazards include asbestos-containing material, PCBs, and lead-based paint. USEPA is given authority to regulate special hazard substances by the Toxic Substances Control Act. Asbestos is also regulated by USEPA under the CAA, and the Comprehensive Environmental Response, Compensation, and Liability Act.

The DoD established the Defense Environmental Restoration Program (DERP) to facilitate thorough investigation and cleanup of contaminated sites on military installations (active installations, installations subject to Base Realignment and Closure, and formerly used defense sites). The Installation Restoration Program and the Military Munitions Response Program are components of the DERP. The Installation Restoration Program requires each DoD installation to identify, investigate, and clean up hazardous waste disposal or release sites. The Military Munitions Response Program addresses nonoperational rangelands that are suspected or known to contain unexploded ordnance, discarded military munitions, or munitions constituent contamination. The Environmental Restoration Program is the Navy's initiative to address DERP.

3.6.2 Affected Environment

The Navy has implemented a strict Hazardous Material Control and Management Program and a Hazardous Waste Minimization Program for all activities. These programs are governed Navy-wide by applicable Office of the Chief of Naval Operations (OPNAV) instructions and at the installation by specific instructions issued by the Base Commander. The Navy continuously monitors its operations to find ways to minimize the use of hazardous materials and to reduce the generation of hazardous wastes.

3.6.2.1 Hazardous Materials

Routine operations at DoD installations require the storage, use, and handling of a variety of hazardous materials. When discussed in this document, hazardous materials include petroleum, oils, and lubricants (POL), cleaning agents, adhesives, and other products necessary to perform essential functions. Fueling operations to support aircraft, watercraft, vehicle operations, and emergency power generation require the distribution and storage of these bulk quantities of this POL. The reference to POLs includes various fuels such as gasoline, jet fuels, and diesel fuels; kerosene; and a variety of oils and other lubricant products. The POL causeway houses several POL pipelines that carry POL for both Navy and commercial use, and the tie-in facility provides the capability to control the flow of fuels along the POL pipelines via a series of interconnecting valves.

DoD installations have management plans for fuels management, spill containment, and clean-up of POL spills and releases. These plans specify that fuel storage and distribution facilities have primary and secondary containment and leak detection features to identify and contain unintended releases, spills, and leaks. In addition, these plans require that the use of hazardous materials be minimized by substituting less toxic products, modifying processes, and designing processes to be more efficient, thus requiring the use of less hazardous substances.

The Defense Logistics Agency Disposition Services (DLADS) through its contractors manages, stores, ships, and disposes of hazardous materials associated with all DoD installations and operations. DLADS maintains all hazardous materials documentation. Furthermore, DLADS contracts with licensed firms for proper disposal of these materials at permitted facilities.

The Guam Environmental Protection Agency (GEPA) stipulates regulations for the management of hazardous materials on GovGuam lands. DoD operations conducted on GovGuam land will comply with all GEPA hazardous material management requirements.

3.6.2.2 Hazardous Waste

Hazardous Waste Generation and Disposal

Operations at DoD installations generate a variety of hazardous wastes, including, but not limited to: medical and dental supplies, adhesives, solvents, lubricants, contaminated absorbents, corrosive liquids, aerosols, herbicides, pesticides, and sludges. In accordance with DoD policies, all facilities must seek to reduce or eliminate hazardous waste generation by implementing BMPs, Standard Operating Procedures (SOPs), and best available technologies. By policy, the generation and subsequent disposal of hazardous waste is considered by DoD to be a means of last resort. There are numerous BMPs and SOPs used by DoD to minimize or eliminate the generation of hazardous waste.

Disposal of hazardous waste generated at DoD facilities in Guam is arranged by DLADS. Specifically, licensed hazardous waste contractors transport and dispose of hazardous waste at permitted facilities. OPNAVINST 5090.1E requires all Navy facilities that generate hazardous waste to have a hazardous

waste management program (HWMP). The HWMP provides guidance for personnel on the proper handling, storage, and disposal of hazardous waste. Furthermore, the HWMP ensures the proper implementation of the USEPA and DOT "cradle-to grave" management requirements for hazardous waste.

Hazardous wastes are likely to be encountered during the demolition of the existing tie-in facility including lead paints and asbestos-containing material (ACM). Paints containing 5,000 milligrams per kilogram (mg/kg), or 0.5% by weight, or more of lead are lead-based paint (LBP). OSHA considers paint containing any measurable concentration of lead to be lead-containing paint (LCP) and a health concern. Seven lead-containing paints (LCP) were identified at the existing tie-in area, with results ranging from 140 mg/kg to 6,900 mg/kg. One of those LCP was identified as a lead-based paint (LBP).

Materials determined to contain greater than, or equal to, 1% asbestos are considered regulated ACM under the National Emission Standards for Hazardous Air Pollutants as specified in 40 Code of Federal Regulations (CFR) Part 61 Subpart M. One ACM was identified at the existing tie-in facility, 10% chrysotile asbestos.

Navy Active Environmental Restoration Sites

The Navy is also in the process of investigating and remediating environmental restoration sites that occurred as a result of past hazardous waste management practices at various Navy facilities located throughout Guam. The former Lower Sasa Fuel Burning Pond, a former Installation Restoration Program (IRP) site, is located adjacent to the east side of Route 1, approximately 400 feet south of the intersection of the POL causeway and Route 1. It is comprised of approximately 20 acres. The facility managed oily wastewater from ships and the Fleet Industrial Supply Center. Waste was collected in the pond and drained through a channel to adjacent wetlands. Contaminants of concern include waste oil.

A removal action under authority of the Comprehensive Environmental Response, Compensation, and Liability Act was implemented to reduce site toxicity and remove petroleum-contaminated soil. The results of the action reduced the ecological risk by removing the contaminated sediment at total extractable petroleum hydrocarbons concentrations above 100,000 milligrams per kilogram. Some contaminated sediment was left-in-place at the site; therefore, land use controls (LUCs) were implemented. The LUC requirements do not apply to the Preferred Alternative project site, but contaminated sediment remains in place so the potential for encountering petroleum hydrocarbons during excavation exists. As such, a soil screening survey was conducted in 2017 and no contamination above soil screening levels was identified.

3.6.3 Environmental Consequences

The hazardous materials and wastes analysis contained in the respective sections addresses issues related to the use and management of hazardous materials and wastes as well as the presence and management of specific cleanup sites in the vicinity of the Proposed Action project area.

3.6.3.1 No Action Alternative

Under the No Action Alternative, the Proposed Action would not occur and there would be no change associated with hazardous materials and wastes. Therefore, no significant impacts would occur with implementation of the No Action Alternative.

3.6.3.2 Construct a New Hardened Tie-In Facility (Alternative 1- Preferred Alternative) Potential Impacts

The study area encompasses the proposed construction, demolition, and ground disturbance areas related to the Preferred Alternative.

Hazardous Materials

The Preferred Alternative involves repairs and improvements to existing POL infrastructure. A range of precautionary measures and construction phasing would be implemented to minimize the potential risk for leaks or spills to occur. Prior to any pipeline adjustments during the construction process, the lines would be prepped and purged of POL as described in Section 3.2.3.2. The Navy-owned piping would be temporarily relocated to avoid interference with the construction of the new hardened structure. Following the completion of the structure, the Navy piping would be routed through the structure and the commercial tie-ins would be completed. The potential for spills would also exist from the refueling of construction vehicles. BMPs as outlined in Section 2-5 would be implemented to minimize the potential for spills during refueling.

During the operational period, the improvements proposed as part of the Preferred Alternative would make the POL infrastructure more resilient and less vulnerable to spills and leaks. In addition to the hardened tie-in facility, the Preferred Alternative includes the installation of seismic isolation valves . The project includes the installation of seismically actuated isolation valves that would limit spill volume in case of a line breach.

Hazardous Wastes

During the demolition of the existing tie-in facility, hazardous materials may be encountered. The contractor would be required to prepare a work plan prior to removal, handling, and disposal of hazardous materials in accordance with all applicable federal and local environmental regulations. All work involving these hazardous materials would be conducted in a controlled manner protective of the workers, facility users, visitors, and the environment. All appropriate measures would be taken to recycle or dispose of waste in accordance with the federal and local regulations.

LCP, LBP, and ACM were identified during the survey of the existing tie-in facility. These materials were reported as having been removed or mitigated under a separate Navy contract. However, the contractor will be required to verify and assess the current site conditions. If LCP, LBP, and/or ACM are still present, lead hazard controls and/or asbestos hazard controls would be required prior to demolition.

There is one known environmental restoration site adjacent to the project area (the Lower Sasa Fuel Burning Site). A soil screening survey was conducted in 2017 and no contamination above soil screening levels was identified. However, contaminated sediment remains in place at the Lower Sasa Fuel Burning Site so the potential for encountering petroleum hydrocarbons during excavation exists. If material(s) that may be hazardous to human health upon disturbance are encountered during construction operations, that portion of work will immediately be stopped and the Contracting Officer notified. Hazardous or toxic waste generated by the Preferred Alternative would be handled, documented, transported, and disposed of according to applicable federal requirements.

Therefore, implementation of the Preferred Alternative would not result in significant impacts with hazardous materials and wastes.

3.6.3.3 New Hardened Tie-In Facility at an Alternative Easement Location (Alternative 2) Potential Impacts

Impacts to hazardous wastes and materials and wastes from Alternative 2 would be the same as for the Preferred Alternative.

Therefore, implementation of this action alternative would not result in significant impacts with hazardous materials and wastes.

3.7 Summary of Potential Impacts to Resources and Impact Avoidance and Minimization

A summary of the potential impacts associated with each of the action alternatives and the No Action Alternative and impact avoidance and minimization measures are presented in Tables 3-5 and 3-6, respectively.

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Table 3-5 Summary of Potential Impacts to Resource Areas

Resource Area	*No Action Alternative*	*Alternative 1 (Preferred Alternative)*	*Alternative 2*
Biological Resources	No impact.	Less than significant impacts with implementation of best management practices and avoidance/minimization measures. The Preferred Alternative would result in the permanent loss of approximately 3,200 square feet (0.07 acres) of wetland adjacent to the POL causeway, but no plants of any conservation concern or critical habitat are present. The Navy determined and the USFWS concurred that the Preferred Alternative may affect, but is not likely to adversely affect (NLAA) the Mariana Common Moorhen with the implementation of avoidance/minimization measures. No significant impacts are expected to MBTA protected species.	Less than significant impacts. Alternative 2 is expected to have similar non-significant impacts as the Preferred Alternative. The difference is that the proposed Tie-In Facility for Alternative 2 would be located to the southeast along the POL causeway. Therefore, Alternative 2 would result in slightly more encroachment into the adjacent wetland because the wetland boundary is narrower in this location. Alternative 2 would result in the permanent loss of approximately 7,400 square feet (0.17 acres) of wetland adjacent to the POL causeway.
Water Resources	No impact.	Less than significant impacts. The Preferred Alternative would involve the clearing and grubbing of approximately 3,200 square feet (0.07 acres) of wetland adjacent to the POL causeway. Improvements associated with the new facilities would be designed based on the principles of low impact development (LID), and would not increase stormwater runoff from the project site into adjacent areas including the marine environment. Erosion control BMPs would be implemented, and conditions of the NPDES and CWA permits would be complied with to avoid and minimize the potential for construction related sediments and/or pollutants being transported into receiving wetlands and marine waters. The Preferred Alternative is located in the floodplain, but there are no practicable alternatives to relocate it outside of the floodplain, and it would not result in adverse direct or indirect effects to the floodplain.	Less than significant impacts. Alternative 2 is expected to have similar non-significant impacts as the Preferred Alternative. The difference is that the proposed Tie-In Facility for Alternative 2 would be located to the southeast along the POL causeway. Therefore, Alternative 2 would result in slightly encroachment into the adjacent wetland because the wetland boundary is narrower at this location. Alternative 2 would result in the permanent loss of approximately 7,400 square feet (0.17 acres) of wetland adjacent to the POL causeway.

Table 3-5 Summary of Potential Impacts to Resource Areas

Resource Area	*No Action Alternative*	*Alternative 1 (Preferred Alternative)*	*Alternative 2*
Air Quality	No impact.	Less than significant impacts. Short-term, temporarily-emitted air emissions (e.g., fugitive dust, combustion of fossil fuels) would be generated during the construction period. BMPs would be implemented to minimize fugitive dust during construction. The Preferred Alternative would upgrade the existing dirt access road to a paved road which is expected to reduce dust emissions from vehicle access. Therefore, an improvement in air quality is expected during the operational period. The project is located in a nonattainment area for sulfur dioxide (SO_2). Total construction SO_2 emissions would be below de minimis thresholds for Clean Air Act (CAA) general conformity. Therefore, the Proposed Action would not trigger a general conformity determination under Section 176(c) of the CAA. The Navy has prepared a Record of Non-Applicability for Clean Air Act Conformity (Appendix D).	Less than significant impacts. Alternative 2 would have similar, non-significant impacts as the Preferred Alternative because it would utilize the same construction equipment and methods, and have the same construction duration. The difference is that the proposed Tie-In Facility for Alternative 2 would be located further from the project staging area than the Preferred Alternative. This additional distance would result in greater emissions for construction tasks associated with the new tie-in facility.
Cultural Resources	No impact.	Less than significant impacts. The project is located in an area of low probability for archaeological resources. The existing Navy-commercial tie-in facility would be demolished, but it was determined to be ineligible for the NRHP (Reed 2018). The project was reviewed pursuant to Stipulation VII.A of the November 2008 PA among CNRM, ACHP, and GHPO regarding Navy undertakings on Guam, and no further action is required under Section 106 of the NHPA.	Less than significant impacts. Impacts would be the same as the Preferred Alternative.

Table 3-5 Summary of Potential Impacts to Resource Areas

Resource Area	*No Action Alternative*	*Alternative 1 (Preferred Alternative)*	*Alternative 2*
Infrastructure	No impact.	Less than significant impacts. The Preferred Alternative would include modifications to electrical, water, and communications service, but any potential increase in demand on these utility systems would be negligible. During construction, temporary bypasses would be installed for existing pipelines to minimize potential service impacts.	Less than significant impacts. Impacts would be the same as the Preferred Alternative.
Hazardous Wastes and Materials	No impact.	Less than significant impacts. Precautionary measures and construction phasing would be implemented to minimize the potential risk for leaks or spills to occur. LCP, LBP, and ACM were identified during the survey of the existing tie-in facility. The contractor will be required to verify and assess the current site conditions. If LCP, LBP, and/or ACM are still present, lead hazard controls and/or asbestos hazard controls would be required prior to demolition.	Less than significant impact. Impacts would be the same as the Preferred Alternative.

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Table 3-6 Impact Avoidance and Minimization Measures

Measure	*Anticipated Benefit / Evaluating Effectiveness*	*Applicable Resource Area*	*Preferred Alternative*	*Alternative 2*
Use of shielded and Migratory Bird Treaty Act-compliant outdoor lights	To prevent disorientation, disturbance, and/or injury to protected avian species.	Biological Resources	x	x
Implement habitat management measures outlined in the JRM Integrated Natural Resources Management Plan	Protect and benefit threatened and endangered species on JRM - controlled lands.	Biological Resources	x	x
Erecting temporary fencing would ensure that waterbirds present in the adjacent wetland would be deterred from entering construction areas.	Deter waterbirds from entering construction areas.	Biological Resources	x	x
The USFWS shall be notified prior to project initiation and provided with the results of preconstruction waterbird surveys.	Prevents or minimizes potential impacts to waterbirds.	Biological Resources	x	x
The contractor shall have a biological monitor on site for the duration of construction to ensure protected wildlife will be avoided during the construction phase of the project.	Prevents or minimizes potential impacts to protected wildlife.	Biological Resources	x	x
The biological monitor shall provide all on-site construction contractor personnel with a fact sheet containing color photographs of potential threatened or endangered species in the action area, and a number to call if a sighting occurs. The biological monitor will keep track of contractors on site, potential Threatened and Endangered species sightings, and make weekly reports to NAVFAC Marianas.	Prevents or minimizes potential impacts to protected wildlife.	Biological Resources	x	x
If a severe weather event occurs (i.e., typhoon) that could potentially disperse wildlife to the area, surveys will be conducted prior to resuming construction. If moorhens are present in the project area, work shall immediately cease to prevent disturbance, and the USFWS shall be contacted for further guidance.	Prevents or minimizes potential impacts to protected wildlife.	Biological Resources	x	x

Table 3-6 Impact Avoidance and Minimization Measures

Measure	*Anticipated Benefit / Evaluating Effectiveness*	*Applicable Resource Area*	*Preferred Alternative*	*Alternative 2*
A biological monitor will conduct surveys for moorhen adults, juveniles, and nests at the project site prior to project initiation. Repeat surveys again within 3 days of project initiation and after any subsequent delay of work of 3 or more days.	Prevents or minimizes potential impacts to Mariana Common Moorhen.	Biological Resources	x	x
If a moorhen nest and/or brood is present, construction activities will immediately cease and the USFWS contacted for further guidance.	Prevents or minimizes potential impacts to Mariana Common Moorhen.	Biological Resources	x	x
If a moorhen is observed within the project site, or flies into the site while activities are occurring, the biological monitor shall halt all activities within 100 feet (30 meters) of the individual(s). Work will not resume until the listed waterbird(s) leave the area on their own accord.	Prevents or minimizes potential impacts to Mariana Common Moorhen.	Biological Resources	x	x
Temporary fencing (can be silt fence comprised of standard plastic or geotech dust fencing material between three and six feet high) shall be erected around construction sites to deter moorhens from entering. Silt fences will also be used around excavated and cleared sites for erosion control. The toe of the fence shall be weighted or buried so that moorhens cannot get under the fence.	Prevents or minimizes potential impacts to Mariana Common Moorhen.	Biological Resources	x	x
No pre-construction vegetation clearing, grubbing, groundwork, or commencement of construction activities that may impact the wetland areas during the peak Mariana moorhen nesting season (July to November)	Prevents or minimizes potential impacts to Mariana Common Moorhen.	Biological Resources	x	x
A post-construction report will be submitted to the Service with 30 days of the completion of the project. The report will include the results of the moorhen surveys, the location and outcome of documented nests, and any other relevant information.	Prevents or minimizes potential impacts to Mariana Common Moorhen.	Biological Resources	x	x

Table 3-6 Impact Avoidance and Minimization Measures

Measure	*Anticipated Benefit / Evaluating Effectiveness*	*Applicable Resource Area*	*Preferred Alternative*	*Alternative 2*
Implement a Storm Water Pollution Prevention Plan (SWPPP) and Low Impact Development (LID)	Prevents or minimizes water quality impacts on receiving waters	Water Resources	x	x
Implement a dust control plan during construction and operations in compliance with Guam Air Pollution Control Standards and Regulations.	Prevents or minimizes fugitive particulate emissions from being transported away from the project area	Air Quality	x	x
An absorbent barrier for oil/petroleum product will be used to contain oil/petroleum waste from the construction site from entering wetland areas along both sides of the existing POL utilities berm.	Prevent or minimize impacts from potential fuel spills.	Water Resources	x	x
A pollution prevention plan for petroleum removal from the existing pipe will be provided for agency review.	Prevent or minimize impacts from potential fuel spills.	Water Resources, Hazardous Materials and Wastes	x	x
Applicable spill response plans will be sent to the cognizant regulatory agency for review and approval.	Prevent or minimize impacts from potential fuel spills.	Water Resources, Hazardous Materials and Wastes	x	x
Fueling of construction vehicles and equipment shall take place at least 50 feet away from the water, preferably over an impervious surface.	Prevent or minimize impacts from fuel spills.	Water Resources, Hazardous Materials and Wastes	x	x
Implement Pollution Prevention Plan for the handling, transport, disposal of and/or to remediate hazardous materials or waste encountered during construction in accordance with applicable federal and State regulations.	Protection of construction workers/community members from any hazardous material encountered during construction.	Hazardous Materials and Wastes	x	x

4 Cumulative Impacts

This section (1) defines cumulative impacts, (2) describes past, present, and reasonably foreseeable future actions relevant to cumulative impacts, (3) analyzes the incremental interaction the proposed action may have with other actions, and (4) evaluates cumulative impacts potentially resulting from these interactions.

4.1 Definition of Cumulative Impacts

The approach taken in the analysis of cumulative impacts follows the objectives of NEPA and CEQ regulations and guidance. In accordance with 40 CFR 1508.1(g), agencies shall consider effects from the proposed action or alternatives that are reasonably foreseeable and have a reasonably close causal relationship to the proposed action or alternatives, including those effects that occur at the same time and place as the proposed action or alternatives and may include effects that are later in time or farther removed in distance from the proposed action or alternatives.

4.2 Scope of Cumulative Impacts Analysis

The scope of the cumulative impacts analysis involves both the geographic extent of the effects and the time frame in which the effects could be expected to occur. For this EA, the study area delimits the geographic extent of the cumulative impacts analysis. In general, the study area will include those areas previously identified in Chapter 3 for the respective resource areas. The time frame for cumulative impacts centers on the timing of the proposed action.

Another factor influencing the scope of cumulative impacts analysis involves identifying other actions to consider. Beyond determining that the geographic scope and time frame for the actions interrelate to the proposed action, the analysis employs the measure of "reasonably foreseeable" to include or exclude other actions. For the purposes of this analysis, public documents prepared by federal, state, and local government agencies form the primary sources of information regarding reasonably foreseeable actions. Documents used to identify other actions include notices of intent for EISs and EAs, management plans, land use plans, and other planning related studies.

4.3 Past, Present, and Reasonably Foreseeable Actions

This section will focus on past, present, and reasonably foreseeable future projects at and near the Proposed Action locale. In determining which projects to include in the cumulative impacts analysis, a preliminary determination was made regarding the past, present, or reasonably foreseeable action. Specifically, it was determined if a relationship exists such that the affected resource areas of the Proposed Action (included in this EA) might interact with the affected resource area of a past, present, or reasonably foreseeable action. If no such potential relationship exists, the project was not carried forward into the cumulative impacts analysis. In accordance with CEQ guidance (CEQ, 2005), these actions considered but excluded from further cumulative effects analysis are not catalogued here as the intent is to focus the analysis on the meaningful actions relevant to informed decision-making. Projects included in this cumulative impacts analysis are listed in Table 4-1 and briefly described in the following subsections.

Table 4-1 Cumulative Action Evaluation

Action	***Level of NEPA Analysis Completed***
Past Actions	
Ammunition Wharf (Kilo Wharf), Outer Apra Harbor	Final Environmental Impact Statement (FEIS)/Record of Decision (ROD) completed 1983
Alpha and Bravo Wharf Improvements, Inner Apra Harbor	EA/FONSI completed 2006
Inner Apra Harbor Wharf Improvements (Uniform & Tango)	NEPA EIS/ROD; project completed 2014
Inner Apra Harbor Maintenance Dredging	Categorical Exclusion (CATEX) completed
Ammunition Wharf Extension (Kilo Wharf), Outer Apra Harbor	FEIS/ROD completed 2007
Ocean Dredged Material Disposal Site Offshore of Guam	FEIS/ROD completed
Polaris Point Beach Restoration, Outer Apra Harbor	CATEX completed
Polaris Point Seawall Repair, Outer Apra Harbor	CATEX completed
X-Ray Wharf Improvements (North berth), Inner Apra Harbor	EA/FONSI completed 2017
Mariana Islands Training and Testing (Regional)	NEPA EIS/Overseas Environmental Impact Statement completed
Present and Reasonably Foreseeable Future Actions	
Port Authority of Guam (PAG) Modernization Program	EA/FONSI
X-Ray Wharf Improvements (South berth), Inner Apra Harbor	EA/FONSI
Guam and Commonwealth of the Northern Mariana Islands (CNMI) Military Relocation	FEIS, Supplemental Environmental Impact Statement, ROD
Transient Nuclear Aircraft Carrier Berth	Deferred
Guam Underwater Electromagnetic Measurement System	EA ongoing
Lima, Mike, November Wharf Repair and Modernization	EA/FONSI completed

4.3.1 Past Actions

Construction activities for these projects are completed and they are currently operational.

Ammunition Wharf, Outer Apra Harbor: Construction of original Kilo Wharf, requiring dredging and filling of submerged lands. Resource Areas with Potential for Cumulative Impacts: water resources.

Alpha and Bravo Wharf Improvements: Extension of Bravo Wharf in Inner Apra Harbor and construction dredging to meet requirements of new class of submarines. Also included utility upgrades at Alpha and Bravo Wharves. Resource Areas with Potential for Cumulative Impacts: water resources.

Uniform & Tango Wharf Improvements: Reconstruction of and structural upgrades to the wharf complex that was badly damaged from a 1989 earthquake. Provision and replacement of shoreside utilities and infrastructure to accommodate Amphibious Readiness Group and Joint High-Speed Vessels transient ships at Tango Wharf. Resource Areas with Potential for Cumulative Impacts: water resources.

Inner Apra Harbor Maintenance Dredging: Dredging of unconsolidated sediment from sea floor fronting Alpha, Bravo, Delta, Echo, Victor, X-Ray, Romeo, Sierra, Tango, and Uniform Wharves in Inner Apra Harbor to restore the original navigational depths at each wharf. Resource Areas with Potential for Cumulative Impacts: water resources.

Kilo Wharf Extension: Extension of Kilo Wharf in Outer Apra Harbor to accommodate new T-AKE ships. Resource Areas with Potential for Cumulative Impacts: water resources.

Ocean Dredged Material Disposal Site Offshore of Guam: Permanent ocean site in the Philippine Sea for disposing of dredged material originating from Guam, including naval facilities at Apra Harbor. Disposal limited to 1,000,000 CY per calendar year. Resource Areas with Potential for Cumulative Impacts: water resources.

Polaris Point Beach Restoration: Repair eroded areas of the Polaris Point coastline south the project area that were damaged by Typhoon Paka by filling the eroded areas with rock and sand in order to make the area safe for recreation. Resource Areas with Potential for Cumulative Impacts: water resources.

Polaris Point Seawall Repair: Backfill and installation of riprap to repair eroded seawall along north shoreline of Polaris Point near Building 4446. Resource Areas with Potential for Cumulative Impacts: water resources.

X-Ray Wharf Improvements (north berth): First component of new earth-filled, sheet pile wharf contiguous to existing X-Ray Wharf bulkhead, including utility improvements and dredging of Inner Apra Harbor fronting X-Ray Wharf to accommodate multi-purpose support ships (T-AKE). Resource Areas with Potential for Cumulative Impacts: water resources

4.3.2 Present and Reasonably Foreseeable Actions

X-Ray Wharf Improvements (south berth): Second component of new earth-filled, sheet pile wharf contiguous to existing X-Ray Wharf bulkhead, including utility improvements and dredging of Inner Apra Harbor fronting X-Ray Wharf to accommodate multi-purpose support ships (T-AKE). Resource Areas with Potential for Cumulative Impacts: air quality, water resources.

Port Authority of Guam (PAG) Modernization Program: New equipment, systems, and buildings; terminal modernization; new yard capacity (Outer Apra Harbor); structural refurbishment of existing docks; dredging to increase berth depths (Wharves F4 – F6 in Outer Apra Harbor); land reclamation for construction of new berth (F7); add 900 feet of berthing space; dredging of Outer Apra Harbor. Projects are within PAG-controlled areas of Cabras Island approximately 2,000 feet northwest of the Proposed Action project site (U.S. Department of Transportation Maritime Administration, 2012). Resource Areas with Potential for Cumulative Impacts: biological resources, air quality, water resources.

Guam and CNMI Military Relocation: Establish operational U.S. Marine Corps (USMC) presence in Guam consisting of approximately 5,000 USMC personnel and 1,300 dependents. Upgrade existing Inner Apra Harbor general purpose wharves and utilities; create embarkation area and amphibious vehicle/small boat laydown area (Inner Apra Harbor). Uniform and Tango Wharf improvements (P-204) have been completed. Resource Areas with Potential for Cumulative Impacts: biological resources, air quality, water resources.

Guam Underwater Electromagnetic Measurement System: Construct an underwater electromagnetic measurement system (UEMMS) off of Polaris Point in Apra Harbor. (NEPA EA underway; project implementation likely post-2022). Resource Areas with Potential for Cumulative Impacts: air quality.

Lima, Mike, November Wharf Repair and Modernization: Re-face wharf and repair wharf deck, fixtures, and electrical utilities (NEPA EA/FONSI completed; construction contract awarded in December 2020). Resource Areas with Potential for Cumulative Impacts: air quality, water resources.

4.4 Cumulative Impact Analysis

The following analysis of cumulative impacts is organized by resource area in the same order presented in Chapter 3. Only the resource areas that have the potential to have cumulative impacts resulting from the incremental effects of the Preferred Alternative or Alternative 2 are addressed. The Proposed Action is not anticipated to have incremental impacts in the following resource areas that would overlap temporally or spatially in a way that would be cumulatively significant with those of the past, present, and reasonably foreseeable actions identified in Section 4.3: cultural resources, infrastructure, and hazardous wastes and materials. Therefore, these environmental resource areas are not analyzed in detail in this section. Where feasible, the cumulative impacts were assessed using quantifiable data; however, for many of the resources included for analysis, quantifiable data is not available and a qualitative analysis was undertaken. In addition, where an analysis of potential environmental effects for future actions has not been completed, assumptions were made regarding cumulative impacts related to this EA where possible. The analytical methodology presented in Chapter 3, which was used to determine potential impacts to the various resources analyzed in this document, was also used to determine cumulative impacts.

The analyses show that, when considered with relevant past, present, and reasonably foreseeable projects, the incremental effects of the Preferred Alternative and Alternative 2 would not contribute to cumulative impacts on pertinent resource areas. Because it would not contribute any incremental effects, the No Action Alternative would not result in cumulative impacts on the relevant resource areas during the construction or operational periods.

4.4.1 Biological Resources

4.4.1.1 Description of Geographic Study Area

The region of influence (ROI) for biological resources includes the construction staging area, the POL causeway, and the Sasa Bay wetlands.

4.4.1.2 Relevant Past, Present, and Future Actions

None of the past, present, or future actions are within the biological resources ROI for the Proposed Action.

4.4.1.3 Cumulative Impact Analysis

Cumulative biological resource impacts from past, present, and future actions within the ROI would be less than significant because adverse effects from past and present actions were discountable and would not directly affect sensitive vegetation or wildlife. The Proposed Action would include some clearing and grubbing within the adjacent wetland, but BMPs would be implemented (as described in Section 2.5) to avoid or minimize potential impacts to biological resources. The present and reasonably foreseeable projects that might interact with the Proposed Action's biological effects are geographically distant (e.g., Naval Base Guam), and none of the projects are expected to result in adverse impacts to wetlands or Mariana common moorhen.

Therefore, implementation of the Proposed Action combined with the past, present, and reasonably foreseeable future projects, would not result in significant impacts within the ROI.

4.4.2 Air Quality

4.4.2.1 Description of Geographic Study Area

The ROI for air quality is within the air basin in which the project is located, mainly in the immediate vicinity of construction activities, and includes the SO_2 nonattainment areas shown in Figure 3-2.

4.4.2.2 Relevant Past, Present, and Future Actions

X-Ray Wharf berth improvements, Marine Corps relocation, UEMMS, and Lima-Mike-November wharf repair and modernization projects may interact with the Proposed Action's air quality impacts if construction of the Proposed Action occurs concurrently with any of the projects.

4.4.2.3 Cumulative Impact Analysis

Cumulative air quality impacts from past, present, and future actions within the ROI would be less than significant because, as described in Section 3.3, transport of air emissions to public areas would be infrequent and when they occur, air pollutant concentrations are expected to be low. The Proposed Action construction period is anticipated to begin in 2022. MILCON P-519, relevant Marine Corps relocation projects around Apra Harbor, UEMMS, Lima, Mike, November Wharf repair and modernization projects are unlikely to overlap with the Proposed Action's construction period. Cumulative air quality impacts within the ROI would be less than significant because impacts from the proposed action are expected to be low and would not overlap with impacts from past, present and foreseeable actions.

During the operational period, the implementation of Proposed Action would reduce fugitive dust due to the paving of the existing unpaved access road. Emissions would be limited to those generated from routine maintenance and operation of the tie-in facility, which would continue at the same intensity as the pre-construction period. Therefore, implementation of the Proposed Action combined with the past, present, and reasonably foreseeable future projects, would not result in significant impacts within the ROI.

4.4.3 Water Resources

4.4.3.1 Description of Geographic Study Area

The ROI for water resources includes the wetlands adjacent to the POL causeway, Sasa Bay, and Apra Harbor.

4.4.3.2 Relevant Past, Present, and Future Actions

Previous actions such as construction and extension of Kilo Wharf, X-Ray Wharf Improvements (north berth), Alpha and Bravo wharf improvements, Polaris Point beach restoration and seawall repair projects have had temporary construction period water quality impacts in their respective Outer Apra Harbor project areas. These projects were completed several years ago and marine water quality has presumably returned to background levels. Ongoing Mariana Islands training and testing activities in Outer and Inner Apra Harbor have a limited potential area of impact (i.e., small zones immediately adjacent to the explosive charge), are generally widely dispersed in space and time, and were

determined to result in changes to water quality below applicable standards, regulations, and guidelines (Navy, 2015). Relevant Marine Corps relocation projects are future projects that may interact with the Proposed Action's water quality impacts if implemented during its construction period.

4.4.3.3 Cumulative Impact Analysis

Cumulative water resources impacts from past, present, and future actions within the ROI would be less than significant because water quality effects of past actions (e.g., would not overlap temporally or spatially with the Proposed Action's expected temporary construction period water quality impacts). In addition, the Proposed Action's construction period water quality impacts would be avoided or minimized through the use of BMPs. As discussed in Section 3.2.3.2, in the long-term, the Proposed Action would have little to no potential to degrade water quality within the adjacent wetlands or Sasa Bay.

Therefore, implementation of the Proposed Action combined with the past, present, and reasonably foreseeable future projects, would not result in significant impacts within the ROI.

5 Other Considerations Required by NEPA

5.1 Consistency with Other Federal, State, and Local Laws, Plans, Policies, and Regulations

In accordance with 40 Code of Federal Regulations (CFR) section 1502.16(c), analysis of environmental consequences shall include discussion of possible conflicts between the Proposed Action and the objectives of federal, regional, state and local land use plans, policies, and controls. Table 5-1 identifies the principal federal and state laws and regulations that are applicable to the Proposed Action, and describes briefly how compliance with these laws and regulations would be accomplished.

Table 5-1 Principal Federal and State Laws Applicable to the Proposed Action

Federal, State, Local, and Regional Land Use Plans, Policies, and Controls	***Status of Compliance***
Clean Air Act	Exempt from General Conformity (see Appendix D)
Clean Water Act	In progress (Section 401 Water Quality Certification and Section 404 nationwide permit to be obtained; NPDES permit to be obtained, as applicable)
Coastal Zone Management Act	Complies (See Appendix B)
Section 438 of the Energy Independence and Security Act	Complies. (Drainage improvements associated with the new facilities would be designed based LID principles, and would not increase stormwater runoff from the project site)
Endangered Species Act	Complies (consultation complete)
Executive Order 11988, Floodplain Management; Guam Floodplain Management Ordinance of 2000	Complies
Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-income Populations	Complies
Executive Order 13045, Protection of Children from Environmental Health Risks and Safety Risks	Complies
Federal Water Pollution Control Act	Complies
Final Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in NEPA Reviews	Complies
Guam Air Pollution Control Standards and Regulations (Regulation 1302, Chapter 1, Title 22 of Guam Administrative Rules and Regulations)	Complies (Dust control plan to be implemented during construction and operations)
National Environmental Policy Act (NEPA); CEQ NEPA implementing regulations; Navy procedures for Implementing NEPA	In progress (EA prepared)
National Historic Preservation Act	Complies (The project was reviewed pursuant to Stipulation VII.A of the November 2008 PA among CNRM, ACHP, and GHPO regarding Navy undertakings on Guam.)
Migratory Bird Treaty Act	Complies
Toxic Substances Control Act	Complies

5.2 Irreversible or Irretrievable Commitments of Resources

Resources that are irreversibly or irretrievably committed to a project are those that are used on a long-term or permanent basis. This includes the use of non-renewable resources such as metal and fuel, and natural or cultural resources. These resources are irretrievable in that they would be used for this project when they could have been used for other purposes. Human labor is also considered an irretrievable resource. Another impact that falls under this category is the unavoidable destruction of natural resources that could limit the range of potential uses of that particular environment.

Implementation of the Proposed Action would involve human labor; the consumption of fuel, oil, and lubricants for construction vehicles and the associated greenhouse gas emissions; construction materials; and potential temporary impacts to air quality, wetlands, and biological resources. Implementing the Proposed Action would not result in significant irreversible or irretrievable commitment of resources, as the new hardened tie-in facility would be located within the existing pipeline causeway and would not encumber additional land or cause significant environmental impacts. Furthermore, a combination of avoidance, minimization, and mitigation measures will offset potential temporary impacts to the, wetlands, and biological resources.

5.3 Unavoidable Adverse Impacts

This EA has determined that the alternatives considered would not result in any significant impacts. Implementing the alternatives would result in the following unavoidable environmental impacts:

- Short-term, temporary biological resources, air quality, and water resources impacts during the construction period. Avoidance/minimization measures would be implemented, and impacts to these environmental resource areas would be less than significant.

5.4 Relationship between Short-Term Use of the Environment and Long-Term Productivity

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

In the short-term, effects to the human environment with implementation of the Proposed Action would primarily relate to the construction activity itself. Biological resources, air quality, and water resources would be impacted in the short-term. In the long-term, operations and maintenance of the tie-in facility would continue in a similar fashion to that of the existing tie-in facility. The construction of the facility and operation would not significantly impact the long-term natural resource productivity of the area because it would continue the existing use of the pipeline easements and would not require additional land acquisition or development. Because of the planned avoidance, minimization, and mitigation measures, the Proposed Action would not result in any impacts that would significantly reduce environmental productivity or permanently narrow the range of beneficial uses of the environment.

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Appendix A
Endangered Species Act Documentation

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DEPARTMENT OF THE NAVY
U.S. NAVAL BASE GUAM
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5090
Ser EV/1370
September 17, 2020

Katherine Mullett
Field Supervisor
Pacific Islands Fish and Wildlife Office
U.S. Fish and Wildlife Service
Department of Interior
300 Ala Moana Boulevard, Room 3-122, Box 50088
Honolulu, Hawaii 96850

Dear Ms. Mullett,

Subject: SECTION 7 INFORMAL CONSULTATION FOR THE NAVY-COMMERCIAL TIE-IN HARDENING (MILCON P-661) AT NAVAL BASE GUAM.

Pursuant to Section 7(a)(2) of the Endangered Species Act, Naval Base Guam (NBG) requests informal consultation related to the Navy/Commercial petroleum, oil, and lubricant (POL) new tie-in facility. The proposed action will provide sufficient setbacks from roadways and the new tie-in would be located in sheltered vaults to protect it from potential threats and reduce its visibility. The action is part of Navy's initiative to decrease vulnerability and increase the resilience of critical infrastructure which will the serve Department of Defense on Guam.

NBG has developed the attached Biological Evaluation (BE) to assess potential impact to the endangered Marianas common moorhen (*Gallinula chloropus guami*). Based on the evaluation presented in the BE, NBG has made a determination that the proposed POL fuel tie-in may effect, but is not likely to adversely affect the mentioned species. NBG requests the Services concurrence with our findings based on the provided information in Enclosures 1 and 2.

My point of contact regarding this matter is Mr. Justin Fujimoto, Natural Resource Specialist at NAVFAC Pacific. He can be reached by email at justin.fujimoto@navy.mil or by phone at (808) 472-1407.

Sincerely,

Ed Moon

E.E. Moon
Installation Environmental Program Director
By Direction of the Commanding Officer

Enclosures: 1. Biological Evaluation
2. P-661 Biological Survey Report

Enclosure 1

Biological Evaluation

1.0 Introduction

The Department of the Navy, Naval Base Guam (NBG) is in the process of preparing a draft Environmental Assessment (EA) for the relocation, replacement and hardening of a Navy/Commercial petroleum, oil and lubricant (POL) tie-in facility on the island of Guam. [redacted]

1.1 Purpose and Need

[redacted]

1.2 Action Location

[redacted]

[redacted]The project area for the proposed action includes the entire causeway from Highway 18 to Highway 1 due to the supporting infrastructure that would be located along the causeway (Figure 1).

Figure 1. Location Map

1.3 Listed Species within the Action Area

The Navy has determined that one Endangered Species Act (ESA)-listed species may occur within the action area. The ESA listed species and the Navy's affects determination is provided in Table 1.

Table 1. Species and affects determination covered under this consultation.

Common Name	Scientific Name	ESA Status	Affects Determination
Mariana common moorhen	*Gallinula chloropus guami*	Endangered	May affect by not likely to adversely affect

Species eliminated from detailed analysis

On April 19, 2019, the Navy requested a species list for the action area. The Service provided a list of species for the Navy including the Mariana fruit bat (*Pteropus mariannus mariannus*) and Guam tree snails (*Partula gibba*, *Partula radiolata*, and *Samoana fragilis*). NBG conducted biological surveys for these species and did not detect any tree snails or the Mariana fruit bat. Additionally, roosting or feeding habitat for the Mariana bat is not present. Based on these findings, NBG has determined that the species are not present within the action area and will not be analyzed as part of this Biological Evaluation.

2.0 Details of the Proposed Action

Navy proposes to construct a concrete shelter over and around a new Navy/Commercial tie-in facility. The proposed project would include hardening the facility with reinforced concrete roof slabs and walls supported on concrete piles. Openings for the facility will consist of a system of hardened doors and louvers. The new tie-in facility would be located along the pipeline easement causeway [redacted] southeast of the existing tie-in facility (Figure 2-1). The new hardened tie-in facility would replace the existing tie-in facility. The existing tie-in piping, valve vaults, and security fencing would be demolished.

2.1 Project Components

Additional improvements would include a new 20-foot wide paved access road, new fencing and security gates at both entrances to the causeway, as well as utility infrastructure serving the new hardened tie-in facility (Figure 2-1). The action would also include the removal of the existing tie-in equipment and demolition of the two existing vaults, site walls, and fencing. The commercial pipes would be re-routed to pass beneath the Navy pipes, and the entire area would be backfilled. The old tie-in facility site would then be revegetated to match the surrounding area.

Figure 2-1 Project Vicinity Map and construction elements.

Temporary bypass of Navy-owned piping

During the initial stage of construction, the Navy would install bypass pipelines to route the existing Navy pipelines around the proposed new hardened tie-in facility. This would ensure that there would be minimal impact to POL service during construction. The bypass pipelines would be routed along the southern portion of the causeway (i.e., within the TriStar easement Figure 2-2) to avoid the area required for the construction of the new hardened tie-in facility.

Construction of new tie in facility

The new hardened tie-in facility would be located [redacted] southeast along the causeway from the existing tie-in. The new hardened tie-in structure would house the valve vault and tie-in equipment to the Navy pipelines and would span approximately half of the causeway on the side with the Navy pipelines (see Figure 2-2 and 2-3). The new structure has exterior dimensions of approximately 56 feet by 26 feet with a gross floor area of 1,456 square feet. The structure will be approximately 25.5 feet tall, and the valve vault would have a pit depth of approximately six feet below finished grade (approximately six feet above mean sea level). The new hardened tie-in structure would be constructed with reinforced concrete roof slabs and walls supported on concrete piles.

The tie-ins into the commercial pipelines would include an isolation valve pit at the tie-in location, owned and operated by TriStar. These valves, along with an in-line isolation valve on

the TriStar lines, would be housed within a commercial valve vault separate from the hardened Navy structure. Once the construction of the new hardened tie-in facility is complete and all new tie-ins have been connected, the Navy-owned pipeline connections would be reinstalled, and the temporary bypass pipelines would be removed.

Figure 2-2 Site plan at the new hardened tie-in facility.

Figure 2-3 Cross-section at the new hardened tie-in facility.

Seismic Isolation Valve Pit

An additional seismic isolation valve pit would be constructed on the POL causeway [redacted] from Highway 1 (Figure 2-1). The seismic isolation valves would serve Navy-owned lines, so the pit would be located within the Navy easement. Construction of these valves may occur concurrently with other project tie-ins to minimize pipeline shutdowns.

Site improvements (Road, road stabilization, fencing, and lighting)

A 20-foot wide (minimum) paved access road would be provided for the entire length of the fuel easement causeway, from its intersection with Highway 18 to Highway 1. The access road would allow for the safe operation and maintenance of the project site as well as providing fire department access. Construction of the road would require earthwork, fill, and grading. Newly graded areas and areas disturbed during construction would be revegetated with grass. The road section would be developed in a way that stormwater runoff drains to vegetated swale areas. The new access road would include new upgraded intersections at Highway 18 and Highway 1 which would require the associated approvals and coordination with GovGuam Department of Public Works.

For most of the causeway, the access road would run along the middle of the causeway. However, the road would be required to run along the south side of the causeway in the vicinity of the new hardened tie-in structure (see Figure 2-2 and 2-3). Due to the limited width of the causeway in total, and the finished floor elevation requirements of the new Navy valve vault, the embankments along both the roadway and the hardened tie-in structure would be stabilized in this location. This would include the installation of approximately 400 linear feet of grouted rip rap along the southern causeway embankment (along the road), and 100 linear feet of grouted rip-rap along the northern causeway embankment (along the hardened tie-in structure). Construction of the grouted rip-rap embankment would extend into the adjacent wetland areas (see Figure 2-2).

The access road would also be required to run along the south side of the causeway in the vicinity of the existing tie-in facility near Route 18. The southern causeway embankment (adjacent to the proposed access road) would need to be stabilized at this location with approximately 150 linear feet of grouted rip-rap. In this area, the adjacent wetland is not located directly adjacent to the causeway, so the construction of the grouted rip-rap embankment would not extend into the wetland areas. To accommodate the road near the new utility berm, 25 feet of vegetation within the wetland will be cleared to accommodate construction equipment.

To provide the necessary security for the new tie-in facility, a vehicle crash-resistant fence and lockable gate will be provided at each entry point of the access road. One security fence and gate would be located approximately 150 feet southeast of the intersection of the causeway and Highway 18. The other security fence and gate would be located approximately 200 feet

northwest of the intersection of the causeway and Highway 1. The security fence and gate would be at least seven feet above finished grade, and would be topped with three strands of barbed wire. Footings for the fence and gate would extend approximately 3.5 feet below grade. Fencing would be extended 5 feet past the last footing on either edge of the causeway into the adjacent vegetation. Extending the fence would provide adequate security but avoid the need to place footings in the adjacent wetland. No fencing and gate will be provided around the hardened structure itself.

Pole-mounted roadway lighting shall be provided from the two entrance gates to the hardened structure. Security lighting would be fully-shielded and downward facing to minimize impacts to birds.

Utilities

A new 8-inch water service line will be provided to serve the new hardened tie-in structure. This waterline will supply two fire hydrants, an internal fire sprinkler system, and water needs of the facility. The new waterline would be buried under the new access road, and would be connected to an existing waterline along Route 18. Since the end of the line near the proposed hardened tie-in structure is considered a dead-end, an automatic flushing device will be needed at the end of the line.

Electrical utilities would include primary and secondary electrical distribution and in-ground cathodic protection for the underground piping. [redacted] Primary electrical facilities will consist of underground electrical distribution system consisting of traffic-rated manholes and concrete encased duct bank that would connect to a pad mounted transformer dedicated to the new facility. From the transformer, an underground secondary service will be provided and will terminate at an enclosed circuit breaker installed within the new hardened tie-in structure. Electrical utilities would extend along the entire length of the causeway and would also provide electricity for the two entrance gates, and for the pole-mounted roadway lighting.

Project Staging Area

A staging/laydown area has been selected in an open field adjacent to Echo Wharf, on the northwestern corner of Dry Dock Island (see inset on Figure 2-1). The staging area measures approximately 40,000 square feet in area, and is located on entirely on Navy land. The area is a grassy field that was previously used by another construction project.

2.2 Construction Methodology

Site preparation would include clearing and grubbing, earthwork, and contaminated soil remediation. The construction site for the new hardened tie-in facility would be approximately

100 feet by 80 feet, temporarily extending 10 to 20 feet beyond the current grassy area to access all sides of the site. Vehicle traffic through the site would not be possible while the buried pipes are exposed and the hardened structure is being constructed. Therefore, both ends of the access road would be used extensively during construction, and would be improved by adding a six-inch layer of gravel along the entire 2,000 feet and widening it from the current six feet to 10 feet. After the new tie-in facility is completed, the new hardened structure and upgraded access road would be constructed.

The new hardened tie-in structure would be constructed on a series of 24-inch octagonal, pre-stressed, concrete piles. Equipment needed for pile installation generally consists of a crawler-mounted pile driving crane with a pile driving hammer mounted on leads fixed to the crane, and a second crane to lift and position piles during the driving. Driven pile foundations are typically installed using impact hammers. For this project, it is anticipated that a hydraulic and/or diesel impact hammer would be used for pile installation.

Due to the depth of excavation required for the proposed new-tie-in facility, dewatering will be required during construction. Sheet piles are likely to be used to limit the extent of excavation. Sheets would be driven with a vibratory hammer and would remain in place for the duration of the below grade construction. Specific dewatering methods would be determined by the contractor, but they could include a well point system or sump. Well point systems consist of pipes inserted into the ground to pump the water outside the limits of excavation. A sump is a pit dug inside the excavation area with a hose pump to remove the water. Water removed from the excavation area during the dewatering process would be routed to a detention swale within the causeway.

3.0 Environmental Baseline Conditions and Status of ESA-Listed Species

Threatened or endangered species that could be in the project footprint are described in this chapter. A description of the status of the species and information about their population are presented below. Threats that have led to the decline of the species are also presented.

3.1 Surveys Conducted for the Proposed Action

Biological surveys for Guam tree snails, waterbirds, Mariana fruit bat, and botanical species were conducted on October 2 and Oct 4, 2019. Five waterbird survey stations were established along the length of the berm, equidistant from each other. Stations were surveyed for 15-minutes to observe waterbirds or listen to vocalizations (Figure 3-1). Field surveys were conducted for two consecutive days starting at 0600 and ended between 0930 and 1100. Moorhens were heard from all five waterbird count stations emanating only from the wetland north of the berm. Distance of the vocalized birds varied between 10 to 50 meters from the toe of the berm. Vegetation on the north side of the berm was very dense making it difficult to

estimate distance of calling birds or make a visual sighting. During the tree snail survey, a running count of gallinule vocalizations was made. At least three individual birds were heard calling from the north side of the berm (wetland closest to Highway 18. See Figure 3-1). Guam tree snail, Mariana fruit bat, and botanical surveys did not detect any protected species (AECOS 2019).

Figure 3-1. Positions of paired tree snail survey stations and location of five waterbird count stations along the pipeline causeway.

Figure 3-2. North wetland from the causeway showing standing water and vegetation immediately off the bank.

Figure 3-3. Pipeline causeway looking southeast.

3.2 Status and Description of the Mariana Moorhen

3.2.1Regulatory Status

The Mariana moorhen (*Gallinula chloropus guami*) was federally listed as an endangered in 1984 (USFWS 2009). The recovery plan for the Mariana moorhen was finalized in 1991 (USFWS

1991) and a five-year status review was completed in 2009 (USFWS 2009). No critical habitat has been designated for this species.

3.2.2 Environmental Baseline of the Species

The most recent population estimates for Mariana moorhen are 90 adult birds on Guam, 41 on Tinian, and 154 on Saipan, resulting in a population estimate of 285 birds (Takano and Haig 2004a, USFWS 2009).

Fena Reservoir is a 203 acre wetland located within the Naval Munitions Site. It is used by moorhens in the dry season (January through May) than the wet season (October through December) when moorhens typically disperse to ephemeral wetlands (Ritter and Savidge 1999, Takano and Haig 2004b). Moorhens numbers in the reservoir have declined since surveys started in 1987 (Brooke and Grimm 2008). In 2009, six moorhens were observed at Fena (Eggleston 2009). The reduced numbers of moorhens and the lack of breeding at Fena Reservoir have been hypothesized to correlate with the loss of *Hydrilla verticillata*, a non-native aquatic plant that forms extensive mats, which was used as foraging and nesting habitat by the moorhen (Brooke and Grimm 2008). Since 2013, moorhen have not been using Fena Reservoir and the Navy has stopped conducting surveys because of this reason (Colt pers comm).

Habitat

Moorhens are found in fresh and brackish-water marshes and ponds. They prefer wetlands with diverse, emergent vegetation containing deep and shallow water areas of vegetation cover and open water (USFWS 2010). Birds avoid wetlands with dense monotypic vegetation such as sites dominated by *Phragmites karka* (USFWS 2010). Wetlands that are important to the Mariana moorhen on Guam include Agana Swamp, Yling River, Naval Station Marsh as well as various water treatment ponds (Stinson et al. 1991, Takano 2003). Many wetlands are impacted from the introduced tilapia (*Oreochromis mossambicus)* that degrades the invertebrate prey used by birds (marshal and Worthington 1996, USFWS 2005, usfws 2010). Therefore, small seasonal wetlands are considered important because they are not impacted by tilapia.

Life Cycle

Little is known about the reproductive cycle of moorhens (USFWS 2010). However, moorhens have been found to nest throughout the year and multiple times a year (USFWS 2010). Nesting may mirror the Hawaiian gallinule (*Gallinula galeata sandvicensis*) pattern that peaks during the Hawaiian rainy season and varies with vegetation growth (USFWS 2010). Juveniles form broods and stay in their natal territory and help rear siblings from younger broods (USFWS 2010).

Threats

Currently, the main two threats to the Mariana moorhen are: (1) loss and degradation of wetland habitat, including filling, alteration of hydrology, invasion of habitat by non-native plants, and unrestricted grazing of domestic and feral ungulates; and 2) predation by introduced species (USFWS 2010).

The 1983 National Wetland Inventory maps for Guam indicate that there were approximately 5,000 ac (2,023 ha) of wetlands on Guam (Guam EPA 2008). Guam has more wetlands and a wider variety of wetland types than does the CNMI, and although it is difficult to quantify the extent of loss, significant losses of wetlands have occurred on Guam (Wiles and Ritter 1993). The extent of predation on the Mariana moorhen by monitor lizards is unknown, but monitor lizards are opportunistic and omnivorous, eating small mammals, insects, other lizards, birds, and eggs (McCoid and Witteman 1993). In the Mariana Islands, monitor lizard predation has been confirmed on moorhen eggs, Micronesian megapodes, and a yellow bittern (*Ixobrychus sinensis*) chick in a nest in a coconut tree (USFWS 2010). Observations at Fena Reservoir indicate moorhens are subject to heavy egg and chick loss by the brown treesnake on Guam (Takano and Haig 2004a). The Mariana moorhen is a medium to large bird, susceptible to snake predation only in the egg stage or when very young and of small body size. Rats (*Rattus* spp.) are also suspected of preying on eggs (USFWS 1996,). Additionally, it is possible feral dogs and cats may prey on birds in some areas (USFWS 2011, Stinson et al. 1992)

4.0 Conservation Measures

The following conservation measures will be implemented at the project site to avoid and minimize effects to the species.

General construction conservation measures:

1. The Service will be notified prior to project initiation and provided with the results of pre-construction waterbird surveys.
2. The contractor will have a biological monitor on site for the duration of construction to ensure protected wildlife will be avoided during the construction phase of the project.
3. The biological monitor will be provided a fact sheet with color photographs of threatened or endangered species in the action area, and a number to call if a sighting occurs. The biological monitor would keep track of contractors on site, potential Threatened and Endangered species sightings, and make weekly reports to NAVFAC Marianas.
4. If a severe weather event occurs that could potentially disperse wildlife to the area, surveys will be conducted prior to resuming construction.

Specific measures for the Mariana moorhen:

5. A biological monitor will conduct surveys for moorhen adults, juveniles, and nests at the project site prior to project initiation. Repeat surveys again within 3 days of project initiation and after any subsequent delay of work of 3 or more days.
6. If a nest and/or brood is present, construction activities will cease and the USFWS will be contracted immediately. Activities may not begin without USFWS assessing the situation.
7. A 100-foot (30 meter) buffer will be established and maintained around all active nests and/or broods until the chicks/ducklings have fledged. No potentially disruptive activities or habitat alteration should occur within this buffer. A biological monitor(s) will be present on the project site during all construction or earth moving activities to ensure that individual moorhens and their nests are not adversely impacted.

8. If a moorhen is observed within the project site, or flies into the site while activities are occurring, the biological monitor shall halt all activities within 100 feet (30 meters) of the individual(s). Work should not resume until the listed waterbird(s) leave the area on their own accord.
9. Temporary fencing will be erected around construction sites to deter moorhens from entering. Silt fences will also be used around excavated and cleared sites for erosion control and to deter moorhens.
10. No preconstruction vegetation clearing, grubbing, groundwork, or commencement of construction activities that may impact the wetland areas during the peak Mariana moorhen nesting season (July to November)
11. A post-construction report will be submitted to the Service with 30 days of the completion of the project. The report will include the results of the moorhen surveys, the location and outcome of documented nests, and any other relevant information.

5.0 Analysis of Potential Effects

This section presents an analysis of effects to Mariana moorhens from installation and operation of the fuel tie-in facility. The impacts analysis is based on the description of the action, conservation actions, the biology and life history characteristics of the species, and awareness of the types of effects that have resulted from similar action in the past.

The following addresses individual stressors and expected results from the action. The proposed action has the potential to interact directly with the ESA-listed species through the following stressors:

- Direct physical impacts from construction and operation
- Noise

5.1 Direct Physical Impacts

The proposed project will have construction equipment and excavated areas next to the wetland. A dewatering basin will also be used to hold excavated material and drain excess water. These holding areas could have standing water and unintentionally attract moorhens to the site. These actions could accidentally harm or create an attractive nuisance that could lead to harming moorhens.

Moorhens could be harmed by construction equipment operating along the construction footprint, construction right-of-way, and utilities berm. The Navy will implement avoidance and minimization measures to identify moorhens in the construction site and halt work in the area preventing possible harm and disturbance. Surveys at the start of the project and during project delays would identify nesting birds. If present, work will cease to prevent disturbance and the

USFWS will be contacted for possible guidance. A buffer zone will be established around the nest and a biological monitor to prevent possible disturbance to the nest.

The dewatering basins or standing water at the construction site could unintendedly attract moorhens and be an attractive nuisance. Mariana moorhens are curious birds that may venture into construction sites or retention areas. Moorhens could become stranded in the sites and become injured or harmed. The Navy will implement conservation measures and install temporary fencing around the construction site and retention areas to deter moorhens from entering. Silt screens will also be installed along the wetland to prevent them from investigating the construction site. These barriers would minimize the likelihood of moorhens entering these sites and preventing the possibility of harm.

Noise

Short-term construction noise would cause a nuisance to moorhens using the wetland impacting foraging or nesting. Construction activities would increase noise levels at the project area specifically when concrete piles are driven and when sheet piles are installed by vibration hammer. Noise levels from the pile driver would be between 91-105 dBA at 15 meters (50 feet) (USEPA 1974) and 84 dBA at 60 meters (200 feet) (Epsilon Associates, Inc 2006). During operation of the finished pipeline and vaults, workers would conduct maintenance checks along the berm. Moorhens using the wetland may be accustomed to some level of noise impacts as maintenance vehicles currently use the berm.

Noise during construction of the pipeline and vault would disturb moorhens in the wetland. As a minimization and avoidance measure, no construction activities that would impact the wetland would be conducted during the peak nesting season during the Guam wet season (July to November). Noise during operation of the pipeline and vault would be limited to occasional maintenance checks of personnel driving along the berm to access the vault. Noise would temporarily disturb any moorhen feeding or foraging at the berm. However, birds primarily feed and forage in the wetland and not on the berm. Once personnel leave the site, moorhens would resume use of the wetland without long-term impacts. Moorhens adapt quickly to construction noise, if in fact they need to acclimate (AECOS 2019). Numerous monitoring events have noted no disturbance to moorhens at construction sites in the Hawaiian Islands (AECOS 2019).

6.0 Conclusion

For this Biological Evaluation, NBG examined the potential impacts from constructing and operation of the fuel tie-in structures on the Mariana moorhen. Proposed conservation will be part of the action to avoid and minimize impacts to the species. Based on the impact analysis,

NBG has made the determination that the fuel tie-in **project may affect, but is not likely to adversely affect (NLAA)** the Mariana moorhen (*Gallinula chloropus guami*). NBG requests concurrence with this determination.

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Enclosure 2

Biological resources surveys for the Navy-commercial tie-in hardening (MILCON P-661) Joint Region Marianas, Guam

Eastern dwarf tree frog (*Litoria fallax*) – R. David photo

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Biological resources surveys for the Navy-commercial tie-in hardening (MILCON P-661), Joint Region Marianas Guam

December 20, 2019 *AECOS* No. 1598

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Executive Summary

Natural resources and focused biological surveys were undertaken by biologists in October 2019 to provide background information on a project site proposed for security and other infrastructure improvements to an existing Navy oil pipeline near Piti, Guam, Marianas Islands. A general description of the natural environment and associated fauna and flora is provided. Biological surveys were directed at establishing presence/absence of fauna: specifically waterbirds, fruit bats, and tree snails, which are variously protected under the Endangered Species Act (ESA), the Migratory Bird Treaty Act (MBTA), or are of conservation concern in the Marianas. The endangered Guam subspecies of the Mariana Common Moorhen was detected in the vicinity of the project. No fruit bats or tree snails were detected. This report is provided as a supplement to the preparation of an Environmental Assessment (EA) for the project.

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Cover photo: An Eastern dwarf tree frog (*Litoria fallax*) common at the berm survey site.

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SECTION 1. INTRODUCTION

The United States Navy (Navy), Navy Base Guam (NGB) proposes to replace an existing [redacted] Navy/Commercial petroleum, oil, and lubricant (POL) tie-in, with a new, hardened tie-in facility. The new tie-in facility would be located to the southeast of the existing tie-in within the pipeline easement causeway between Highway 18 and Highway 1, in the vicinity of Apra Harbor, Guam (Figures 1 and 2). The Proposed Action (MILCON P-661; herein, the "Project") would include hardening the new facility with reinforced concrete roof slabs and walls supported on concrete piles. The new hardened tie-in facility will replace the Navy-owned tie-ins at the existing tie-in facility. Exposed Navy piping at the existing Navy-Commercial Tie-in will be capped and buried or removed. Site improvements and utility infrastructure would be constructed to support and protect the new tie-in facility.

This report presents results of biological surveys conducted at the approximately 1.42 ha (~3.5 ac) action area pipeline causeway. The purpose of the surveys is to provide baseline information on natural resources as a contribution to an Environmental Assessment (EA) being prepared for the Project. In addition to providing general information on natural resources potentially impacted by the Project, the surveys focused on establishing either presence or absence of specific listed (threatened, endangered, or proposed for listing) species, to wit: Mariana Common Moorhen (*Gallinula chloropus guami*), Mariana fruit bat (*Pteropus mariannus*), and Guam native tree snails (Family Partulidae).

The entire Project area is located on fill land connecting to Dry Dock Point and Dry Dock Island projecting into Apra Harbor, essentially defining Sasa Bay as a distinct part (a small bight) of Apra Harbor. The Highway 18 causeway was constructed in the 1970s south of Cabras Island and the Guam commercial port. The pipeline causeway (herein referred to as the "berm", see Figure 2) was constructed across low-lying ground (wetlands) to support an oil pipeline connecting the Lower Sasa Valley Tank Farm and the commercial port. This addition of fill land, some 620 m (2030 ft; pavement to pavement) in length and roughly 15 m (50 ft) across, cut off a triangular-shaped area of marshy ground now defined by Marine Corps Drive (Highway 1), Highway 18 (on previous mentioned Pol Causeway), and the pipeline berm. This low-lying area north of the berm is flooded by (presumably) fresh water that laps against the edge of the berm for nearly its entire length (Figure 3) and is without a visible surface outlet. No water level changes in this wetland were noted during our survey. Although mostly viewed during morning hours on survey days and thus

Figure 1. Project location on map of Guam (modified from CIA, 1991).

Figure 2. Location map of Project survey area indicated in red.

Figure 3. West end of north side of pipeline berm showing standing water immediately off the bank.

Figure 4. Pipeline causeway (berm) looking southeast from near the west end.

possibly at about the same tidal stage, no obvious littoral border is evident at the water line. We conclude that this body of water is essentially non-tidal.

The berm itself has a high part over the oil pipeline and lower part supporting an unpaved access road (Figure 4, above). The surface of the berm is maintained by close cropping (mowing and weed-whacking) of grasses, herbs, and any shrubs intruding along the margins.

Figure 5. West end of south side of pipeline berm showing standing water and *Rhizophora mucronata* of the Sasa Bay mangal immediately off the bank.

On the south side of the berm, the ground is low-lying but not flooded, although a tidal flat of Sasa Bay is not far distant and extends up to the berm at the extreme west end of the fill (Figure 5, above). The tidal flat is distinct in being regularly flooded by the tide and supporting several species of littoral trees forming a mangal (mangrove forest). The remainder of the area adjacent to the berm is lowland forest in appearance, but Project drawings (Navy, 2018) indicate a wetland boundary extending nearly the entire length and located just off the cleared vegetation of the berm. An extensive wetland extends south to the tidal lands of Sasa Bay.

SECTION 2. BIOLOGICAL BASELINE SURVEY

Survey Methods

Natural resources/biological surveys for the Project areas were undertaken between October 2 and October 4, 2019. Surveys were conducted starting promptly at 0600 and usually ended between 0930 and 1100 each day to avoid excessive afternoon heat conditions. One evening visit was made and several visits made at other times to nearby locations—specifically, the vicinity of Echo Pier on Dry Dock Island, the Marianas Yacht Club on Sasa Bay, and the pipeline extending north from the Project area along Marina Road; see Fig. 2)—to establish a broader sense of the environments and biota extant in the general vicinity of the Project.

Botanical Survey

A pedestrian botanical survey was conducted in the Project areas: The track of the botanist was recorded using a sub-meter handheld GNSS unit (Trimble 6000 series GeoXH) and locations of any native plants of special interest or conservation concern could be recorded as discovered.

Identifications relied on the author's experience with the flora of the Hawaiian Islands, which has many elements in common with Guam, and on previous surveys conducted in the Marianas Islands (for example, WCP & *AECOS*, 2008). Aids utilized for plant identifications were Stone (1970), Moore et al. (1977), Raulerson & Rhinehart (1992), and Whistler (1992, 1994).

Tree Snail Survey

A survey of the vegetation along the berm was made for tree snails. Although endangered tree snails—humped tree snail (*Partula gibba*), Guam tree snail (*Partula radiolata*), and fragile tree snail (*Samoana fragilis*)—were the intended focus of the survey, all snails located at preselected sampling stations were noted.

Stations were "preselected" using a randomizing technique. Starting at a base point at the far west end of the Project berm, a random number table was consulted to generate values between 10 and 60 m, and these applied sequentially as distances from one station to the next. This preselection resulted in 21 randomly spaced points along the berm (Table 1), established using ArcMap as a background shape file that was loaded onto the handheld

GNSS unit. Each of the 42 potential survey sites (21 on each side of the berm) was visited once over three mornings and the actual station point position recorded on the GNSS unit (and shown in Figure 6). The survey area at each station was a roughly 10 m long by 10 m wide area centered on the station point set close to the edge of the maintained vegetation. Only the 10 x 5 m portion was actually sampled, as the inner half of each station was mowed lawn. At four of these stations, the vegetation was either lacking (for example, a road at the end of the berm) or consisted only of mowed lawn. At the remaining 38 stations, the flora present was recorded and the most abundant plant species noted.

Table 1. Tree snail sampling station marks
(distance east from base point along a 610 m transect line).

Station	meter mark	Station	meter mark
0	0	10	307
1	24	11	338
2	38	12	358
3	60	13	377
4	110	14	404
5	159	15	450
6	215	15	460
7	239	17	479
8	268	18	512
9	287	19	558
		20	607

Both biologists participated in searching the vegetation (and ground where open) taller than 0.5 m, dividing the effort between searching low vegetation and underside of tree leaves and utilizing Leica 8 X 42 binoculars to scan the taller trees. A timer was set for a search period of 5 minutes. This method follows essentially that recommended by Fiedler (2019) for a "detection survey". No attempt was made to quantify snails beyond qualitative notes of abundance at the survey station.

Figure 6. Recorded positions of paired tree snail survey stations and location of five water-bird count stations along the pipeline causeway.

Wetland Bird Survey

Five 15-minute time-dependent waterbird counts were conducted along the berm, with stations spaced equidistant from each other along the length of the survey area (Fig. 6, above). Given the paucity of avian species and numbers currently existing on Guam, we included in the point-counts all other birds detected during the time-dependent waterbird counts. These surveys were repeated on two successive days. Field observations were made with the aid of Leica 8 X 42 binoculars and by listening for vocalizations. All species seen and heard were recorded for each station count. Time not spent counting at point-count stations was utilized to search for species and habitats not detected during the point-counts. Additionally, a running count was made of vocalizations of gallinules heard during the course of the tree snail surveys. Identification of avian species was based on the zoologist's prior experience conducting surveys on Guam and elsewhere in the Marianas (David, 1991a,

1991b, 1993a, 1993b; David and USGS, 2000). Taxonomy and phylogenetic order follow Clements et al. (2019).

Fruit Bat Survey

Vegetation along the berm margins was searched for roosting or feeding *fanihi* or Marianna Fruit bat. Field observations were made with the aid of Leica 8 X 42 binoculars and by listening for vocalizations.

Surveys of Other Fauna

Incidental observations of amphibians, lizards, and conspicuous insects were made during the time the biologists spent on the sites. Specimens unknown to the team members were photographed for later identification.

Results

Vegetation

The vegetation along the entire length of the berm is that of a closely cropped lawn (mowed and weed-whacked). Indeed, some weed-whacking was occurring while we were on site. Maintenance of the ground generally extends most of the way down the margins of the berm on the north side (pipe side) where the berm is high and the margin steep to a point a few meters beyond the road or track on the south side.

On the south side, the berm slopes very gently into the forested ground in most places. Beyond the maintained area, the vegetation consists of some areas of dense grasses, low herbs, and ferns, and is more or less open, although sections of dense grasses and/or shrubs occur. In most areas, various trees and tall shrubs create a canopy that varies from open to closed. Water was not encountered on the ground surface along the south side of the berm except at the far west end of the Project site where the mangal (mangrove forest) of Sasa Bay extends up to the base of the berm.

To the north side of the berm, trees are the normal vegetation, shrubs being less prominent because these are regularly weeded out along the berm margin down to the water line.

Flora

Table 2 lists all of the plant species observed during the surveys. Species of ferns, fern allies, and flowering plants are listed by plant family. Species names mostly follow the University of Guam checklist (GUAM, 1996;) for species known from Guam. Note <3> indicates a species we recorded but is not found on that listing. Note <2> indicates a species observed that lacked flowers or fruit, typically necessary to confirm an identification. Common names used on Guam are provided where these could be found (mostly from Stone, 1970).

By "status" is meant the accepted status of a species as native or non-native to the Marianas Islands. All native plants recorded in our survey are indigenous species (**Ind**); that is, native to Guam, but not uniquely so, being native to other areas of the Pacific. No endemic species were recorded; endemic species are uniquely native to Guam and therefore threats to the populations on Guam can lead to their listing as threatened or endangered. Species marked "Nat" in Table 2 are naturalized species: introduced species that now occur in the wild in Guam. An ornamental plant (Orn) is one that was planted and has not shown an ability to spread out on its own.

A qualitative abundance scale is given in the Notes column for the plant species (see abundance key at end of table). The total number of plants listed is 74. Seven of the 8 ferns and fern allies listed are native (indigenous) species on Guam; *Pteris vittata* is a relatively recent introduction (Raulerson & Rinehart, 1992). Eighteen (24%) of the flowering plants are natives. The flora appears to be typical for lowland areas subject to wet conditions, including perennially flooded ground.

Tree Snails

Results of the surveys at stations distributed along both sides of the pipeline causeway are given in Appendices A1 (south side) and A2 (north side). Each table is divided into four sections (groups of rows). The uppermost section lists snails observed (tree snails being row 1), absence of tall vegetation (shrubs and trees), presence of an abundance of ants. The latter two being factors expected to interfere with suitability of conditions for providing tree snail habitat.

The second section lists plant species in order of "level of association" (Fiedler, 2019) with partulid snails on Guam, representing plants on which native tree snails have been associated with. The four levels (from 4 down to 1) express decreasing association with partulid snails in Guam wide surveys. Only *Cocos nucifera* in our list is a level 4 species. *Hibiscus tiliaceus*, *Morinda citrifolia*, and

Table 2. Listing of plants (flora) observed in and adjacent to survey areas.

FAMILY *Species*	Common name(s)	Status	Location	Notes
FERNS and FERN ALLIES				
MARATTIACEAE				
Angiopteris evecta (Forst. f.) Hoffm.	---	**Ind**	F	R
NEPHROLEPIDACEAE				
Nephrolepis biserrata (Swartz) Schott	---	**Ind**	F E	C
Nephroplepis hirsutula (Forst. f.) Presl	---	**Ind**	F E	O
POLYPODIACEAE				
Polypodium punctatum (L.) Swartz	---	**Ind**	F/W	O <1>
Polypodium scolopendria Burmann f.	---	**Ind**	F/W E	C <1>
Pyrrosia lanceolata (L.) Farwell		**Ind**	F/W	U <1>
PSILOTACEAE				
Psilotum nudum (L.) Grisebach	---		F	R
PTERIDACEAE				
Pteris vittata L.	ladder brake	Nat	F	R
THELYPTERIDACEAE				
Thelypteris interrupta (Willd.) Iwats.	---	**Ind**	F	R
FLOWERING PLANTS DICOTYLEDONES				
ACANTHACEAE				
Barleria repens C. Nees	pink-ruellia	Nat	M	U <3>
Thunbergia fragrans Roxb.	clockvine	Nat	F/W	O <2,3>
APOCYNACEAE				
Plumeria obtusa L.	Singapore plumeria	Orn	E	R
ASTERACEAE				
Bidens alba (L.) DC.	---	Nat	E	C
Calyptocarpus vialis Less.	---	Nat	M	O
Chromolaena odorata (L.) King & Rob.	Siam weed	Nat	F E	C <3>
Mikania scandens (L.) Willd.	mile-a-minute vine	Nat	F E	A
Pluchea indica (L.) Less.	Indian sourbush	Nat	F/W E	O
Sphagneticola trilobata (L.) Pruski	*masigsig*, wedelia	Nat	E	C
Tridax procumbans L.	coat buttons	Nat	E	O
Vernonia cinerea (L.) Less.	*chaguan* Santa Maria	Nat	M	R
BIGNONIACEAE				
Spathodea campanulata P. Beauv.	African tulip tree	Nat	F	C
Tabebuia pentaphylla (L.) Hemsley	pink tabebuia or *pallida*	Nat	F	O
BORAGINACEAE				
Tournefortia argentea L. fil.	---	**Ind**	F	R
CARICACEAE				
Carica papaya L.	papaya	Nat	F	R

Table 2 (continued)

FAMILY *Species*	Common name(s)	Status	Location	Notes
CASUARINACEAE				
Casuarina equisetifolia L.	*gågu*, ironwood	**Ind**	F	O
CONVOLVULACEAE				
Ipomoea triloba L.	*fofgu-sabana*, little bell	**Ind**	E	U
EUPHORBIACEAE				
Euphorbia heterophylla L. *or E. cyathophora*	---	Nat	E	R <2>
Euphorbia hirta L.	*golondrina*	Nat	M	O
Phyllanthus cf. *amarus* Sch. & Th.	*maigo-lalo*	Nat	M	O <2>
FABACEAE				
Aylsicarpus vaginalis (L.) DC.	---	Nat	M	U
Desmanthus pernambucanus (L.) Thellung	virgate mimosa	Nat	E	R
indet. small creeping Papillionioideae	---	Nat	M	A <2,3>
Inocarpus fagifer (Park.) Fosb.	*budo*	Nat	FW	O
Leucaena leucocephala (Lam.) de Wit	*tangantangan*	Nat	F/W E	A
Mimosa pudica L.	*sensitive plant*	Nat	M	U
Pterocarpus indicus Willd.	*nana*	**Ind**	E	R
LAMIACEAE				
Hyptis sp.	---	Nat	E	R <2>
LAURACEAE				
Cassytha filiformis L.	*agasi; mayagas*	**Ind**	W	R
MALVACEAE				
Hibiscus tiliaceus L.	*pago*	**Ind**	F/W	A
Sida rhombifolia L.	*escobilla dalili*	Nat	E	R
PASSIFLORACEAE				
Passiflora suberosa L.	---	Nat	E	R
POLYGALACEAE				
Polygala paniculata L.	bubblegum plant	**Ind**?	M E	O
RHAMNACEAE				
Colubrina asiatica (L.) Brongniart	*gasoso*	**Ind**	F	R
RHIZOPHORACEAE				
Rhizophora mucronata Lam.	*mangle hembra*	**Ind**	W	R
RUBIACEAE				
Spermacoce suffrutescens Jacq.	---	Nat	M E	U
Morinda citrifolia L.	*lada*	**Ind**	F	U
TILIACEAE				
Mutingia calabura L.	Panama cherry	Nat	F	U
URTICACEAE				
Pilea microphylla (L.) Liebm.	artillery plant	Nat	E	U

Table 2 (continued)

FAMILY *Species*	Common name(s)	Status	Location	Notes
VERBENACEAE				
Avicennia marina var. *alba* (Bl.) Bakh.	---	**Ind**	W	R
Stachytarpheta sp.	---	Nat	E M	U
FLOWERING PLANTS MONOCOTYLEDONES				
ARECACEAE				
Areca catechu L.	*pugua*, betal-nut	Nat	F	R <2>
Cocos nucifera L.	*niyok*, coconut	Nat	F/ W E	O
CYPERACEAE				
Cyperus compressus L.	---	Nat	M	O
Cyperus polystachyos Rottb.	---	**Ind**	M E	O
Cyperus rotundus L. or *C. iria*	*chaguan umatac*	Nat	W	R <2>
Fimbristylis dichotoma (L.) Vahl.	---	**Ind**	F/W M E	A
PANDANACEAE				
Pandanus dubius Spreng.	*pahong*	**Ind**	F	R
Pandanus tectorius Park	*aggak*	**Ind**	F	O
POACEAE				
Arundo donax L.	giant reed	Nat	F M	C
Bambusa vulgaris Schrad. ex Wendl.	*piao palaoan*, bamboo	Nat	F M	U
Bothriochloa bladhi (Retz.) S.T. Blake	beard grass	Nat	B	A <3>
Chrysopogon aciculatus (Retz.) Trin.	golden beardgrass	**Ind**	B M	C
Cenchrus echinatus L.	sandbur	Nat	M	R
Chloris barbata (L.) Sw.	fingergrass	Nat	M	R
Cynodon dactylon (L.) Pers.	Bermuda grass	Nat	M	C
Dactyloctenium aegyptium (L.) Beauv.	crowfoot grass	Nat	M	A
Digiteria cf. ciliaris (Retz) Koeler	crabgrass	**Ind**	M	U <2>
Eleusine indica (L.) Gaertn.	*chaguan kabayo*, wiregrass, goosegrass	Nat	M	C
Eragrostis sp.	---	Nat	B	
Eustachys patraea (Sw.) Desv.	---	Nat	M	U
Megathyrsus maximus (Jacq.) B.K. Simon & W.L. Jacobs	Guinea grass	Nat	F	C
Paspalum sp.	Rhodes grass ?	Nat	M	R
Saccharum spontaneum L.	wild cane	**Ind**	F/W E	A
Sporobolus sp.	---	Nat	M	O

Table 2 Legend:

STATUS = distributional status for the Mariana Islands:

End = endemic; native to the Mariana Islands and found naturally nowhere else.
Ind = indigenous; native to the Mariana Islands, but not unique to them.
Nat = naturalized, exotic, plant introduced to the Mariana Islands by man, and mow well-established outside of cultivation.

Table 2 (continued)

Orn = exotic, ornamental or cultivated; plant not naturalized (not well-established outside of cultivation).

DISTRIBUTION: F/W – forest or wetland, off of berm; E – berm edge, bank; M – top of berm where regularly mowed.

NOTES:

Qualitative abundance values used are as follows:

R – Rare - only one or two plants seen.
U - Uncommon - several to a dozen plants observed.
O - Occasional - found regularly, but not abundant anywhere.
C - Common - considered an important part of the vegetation and observed numerous times.
A - Abundant - found in large numbers; may be locally dominant.

<1> – an epiphyte; growing on trees within swamps and outside of wetlands.
<2> - Specimens lacking fruit or flower; identification uncertain.
<3> - Species not listed in GUAM checklist or by Raulerson (2006) from Guam.

Colubrina asiatica are level 3 species; *Nephrolepis hirsutala, Carica papaya, Instia bijuga*, and *Pandanus tectorus* are level 2 plant species; and *Bambusa vulgaris, Chromolaena odorata,* and *Leucaena leucocephala* are level 1 species. All plants in Fiedler's association table that were recorded at the site are included in our table, whether or not they occurred in any of the search stations.

Section 3 in the tables includes other plant species in the survey area with generally broad leaves that were searched at stations where they occurred. Section 4 lists miscellaneous plant species present in some of the search stations that would not be expected to support partulids.

No tree snails of any kind ("target snails") were detected by the transect/ station surveys. Live and empty shells of Giant African snail (*Lissachatina fulica*) were observed at many of the stations. The presence of an abundance of black ants feeding on mealy scale insects, was noted at some stations, particularly the underside of *pago* leaves. These concentrations of ants would likely impact negatively on other invertebrates in the vegetation.

Avifauna

A total of 96 individual birds of 11 species, representing nine separate families, were recorded during station counts (Table 3). Five of the species recorded are native resident species, one of which, the Mariana subspecies of the Common Moorhen (*Gallinula chloropus guami*) is listed as endangered under both the federal and the Government of Guam endangered species statutes. Two

Table 3. Avian species detected
during time dependent point counts October 2019

Common Name	Scientific Name	ST	*RA*
	PHASIANIDAE - Pheasants & Partridges		
	Phasianinae - Pheasants & Allies		
Black Francolin	*Francolinus francolinus*	IM	0.17
Domestic Chicken	*Gallus* sp.	A	0.08
	COLUMBIFORMES		
	COLUMBIDAE - Pigeons & Doves		
Philippine Turtle-Dove	*Streptopelia bitourquata*	A	0.50
	GRUIFORMES		
	RALLIDAE - Rails, Gallinules and Coots		
Mariana Common Moorhen	*Gallinula chloropus guami*	**EEs**	1.58
	CHARADRIIFORMES		
	CHARADRIIDAE - Lapwings & Plovers		
	Charadriinae - Plovers		
Pacific Golden-Plover	*Pluvialis fulva*	IM	0.17
	SCOLOPACIDAE - Sandpipers		
	Numeniinae -Curlews		
Whimbrel	*Numenius phaeopus variegatus*	IM	0.58
	LARIDAE - Gulls, Terns & Skimmers		
	Sterninae - Terns		
Common Tern	*Sterna hirundo*		0.08
	PELECANIFORMES		
	ARDEIDAE - Herons, Bitterns & Allies		
Yellow Bittern	*Ixobrychus sinensis*	IR	0.17
Pacific Reef-Heron	*Egretta sacra*	IR	0.75
	PASSERIFORMES		
	DICURIDAE - Drongos		
Black Drongo	*Dicurus macrocercus*	A	2.33
	PASSERIDAE - Old-world Sparrows		
Eurasian Tree Sparrow	*Passer montanus*	A	1.58

Key to Table 3.

ST Status

IM Indigenous Migrant – Native but not unique to the Mariana Islands, does not nest in the islands.

A Alien – Introduced to the Mariana Islands by humans.

EEs Endangered Endemic sub-species – Native and unique to the Mariana Islands, and also listed as an endangered species.

IR Indigenous Resident - Native resident, also found elsewhere naturally.

RA Relative Abundance - Number of birds detected divided by the number of point counts (5).

species, Yellow Bittern (*Ixobrychus sinensis*) and Pacific Reef-Heron (*Egretta sacra*), are indigenous resident breeding species. Additionally, three other species recorded: Pacific Golden-Plover (*Pluvialis fulva*), Whimbrel (*Numenius phaeopus variegatus*), and Common Tern (*Sterna hirundo*), are migratory indigenous species protected under the federal Migratory Bird Treaty Act. The remaining five species are established alien species, introduced by humans.

Mariana Common Moorhen were heard from all five of the waterbird count stations. Calls were heard emanating only from the wetlands north of the pipeline berm. Distances between the count stations and the heard birds varied from approximately 10 to 50 m from the toe of the pipeline berm. The vegetation off the north side of the berm is very dense making it difficult to accurately determine distances to calling birds or make visual sightings. One can assume that Moorhen occur within a few meters of the berm and along its entire length on a seasonal and/or temporal basis.

Avian diversity and densities were very low. This fact is no surprise given the depauperate state of avian species remaining on Guam (Wiles et al., 2003).

Other Fauna Observed

We observed four species of frogs and one toad while conducting the field surveys. Interestingly several of the species we encountered in relatively high densities are recently established species on the Island of Guam (Christy et al., 2007; Wostl, 2012).

AMPHIBIANS — Greenhouse frogs (*Eleutherodactylus planirostris*) were heard all days that we were on the site. This species is a relatively newly established species on Guam, first reported in numbers in 2003 (Christy et al., 2007; Wostl, 2012). Several crab eating frogs (*Fejervarya cancrivora*) were seen on the Sasa Bay side of the berm. This frog was first recorded on Guam in 2004 (Christy et al. 2007). Barking frogs (*Hylarana guentheri*) were a large distraction during the early morning bird counts, as their numbers adjacent to the berm survey site must be very large considering the amount of calling heard all days on the site. This species has been established on Guam since at least 2003 (Christy et al., 2007; Wostl, 2012). Numerous Eastern dwarf tree frogs (*Litoria fallax*; see cover photo) were both seen and heard in all areas on the site with tall grass. This species was introduced to Guam sometime around 1968 and is widespread on the lower three quarters of the Island today (Christy et al., 2007; Wostl, 2012). In addition to these relatively new introductions, the ubiquitous Cane toad (*Rhinella marina*) was seen on all days on the berm site.

REPTILES — We also recorded three reptiles: mourning gecko (*Lepidodactylus lugubris*) and blue-tailed skink (*Emoia caeruleocauda*; Figure 7), in numerous locations on either side of the mowed berm. Additionally, several curious skink (*Carlia ailanpalai*; Figure 8) were seen. All three of these lizards are established alien species.

Figure 7. A Blue-tailed skink (*Emoia caeruleocauda*) at the berm site.

CONSPICUOUS INSECTS — We saw at least five species of butterflies whilst surveying on the sites. The ones that we could identify without capturing (identified from Schreiner and Nafus, 1997) included Brown skipper (*Badamia exclamationis*), Grassdart (*Taractrocera zicle*), Black citrus swallowtail (*Papilio polytes*), Large grass yellow (*Eurema blanda*), and Blue-branded king crow (*Euploea eunice*). We observed at least three species of wasps, the most visible and gaudy was a potter wasp (*Delta pyriforme;* Figure 9 encountered each day in numbers near the valve-housing end of the berm survey area, where they were gathering mud to make their eponymous nests. This species, which has become a pest on Guam, is thought to have been introduced in the early 1970's (Schreiner and Nafus, 1986).

Figure 8. A curious skink (*Carlia ailanpalai*) at the berm site.

Two species of nymphalid butterflies from the Mariana Islands are listed as endangered under the ESA: The Mariana Eight Spot Butterfly, *Hypolimnas octocula marianensis* and the Mariana Wandering Butterfly, *Vagrens egistina* (USFWS, 2015). *V. egistina* has not been observed on Guam since the 1970s (Moore, 2014).

H. octocula is still extant over karst landscapes on Guam, where individuals are nearly always observed in the vicinity of the larval host plants: *Elatostema calcareum* and *Procris pedunculata* (Schreiner and Nafus, 1996). Both species are herbaceous forest plants in the Family Urticaceae. The only plant in the Family Urticaceae observed at our survey sites was *Pilea microphylla*, a small introduced plant likely unsuitable as a food source for *H. octocula*. No adult butterflies of this or other common *Hypolimnas* species were observed in the survey areas.

Figure 9. Potter wasp (*Delta pyriforme*) photographed at berm site.

SECTION 3. EFFECTS OF PROPOSED ACTION

General Considerations

Wetlands

Although no effort was made to establish the boundaries of wetlands in the survey areas, it is clear that many of the plants are facultative wetland species (few obligate wetland species were recorded) and water is a significant factor in the areas off the pipeline berm, especially on the north side where standing water is present just off the berm slope and provides a clear jurisdictional waters demarcation. The wetland demarcation on the south side is subtle as the fill slopes gradually (and unperceptively in most places) into the adjacent vegetation. Only at the west end where the tidally flooded mangal is present (see Figure 5, above) is the boundary evident.

General Environment Observations

Considering the environments on the north and south sides of the pipeline berm, these areas would seem to be different, although before the berm was constructed were contiguous. As a result of the berm construction, the area to the north became an essentially isolated wetland, whereas the portion of this wetland to the south now as before grades into tidal mangal, tidal flats, and eventually marine Sasa Bay (a bight off inner Apra Harbor).

In our survey, only the vegetation close to the edges of the berm was explored, and any observations beyond were limited to auditory detections, especially during the waterbird surveys. With respect to the latter, the most conspicuous animal calls were those of the Mariana Common Moorhen and the barking frog. Moorhen calls were only detected to the north of the berm. Barking frogs, on the other hand, seemed to be distributed more or less equally to either side. With regard to the vegetation, the results of qualitative characterizations of the flora provided by our tree snail survey stations (Appendix A) show generally only minor differences between the two sides. *Hibiscus tiliaceus* seems a bit more prevalent on the north side, whereas shrub and tree diversity and occurrence of areas of dense, tall cane grasses (both wild cane and giant reed) are greater along the south side. The dense stand of tall grasses shown in Fig. 3 on the north side is an exception for the north side.

Protected Species

The only currently listed or proposed for listing species recorded within or adjacent to the survey sites was the Mariana subspecies of the Mariana Common Moorhen (*Gallinula chloropus guami*). At least three individual birds were heard calling from the wetland located to the north of the pipeline berm. It is likely that this species nests in that wetland.

Three other species recorded: Pacific Golden-Plover, the Asiatic subspecies of Whimbrel, and Common Tern, are migratory species protected under the federal Migratory Bird Treaty Act (MBTA).

Impacts Assessment

The proposed Navy-commercial tie-in hardening (MILCON P-661) as described would seem to have minimal deleterious impacts on either protected resources or other natural resources of conservation interest because the site surveyed is a highly disturbed, man-made berm that is regularly mowed and offers no habitats or unique vegetation that would support native fauna. However, to the extent that any anticipated work requires activities that extend off the lateral boundaries of the berm as presently defined by wetland boundaries, potential exists for impacts to the wetlands.

A resident population of endangered Mariana sub-species of the Mariana Common Moorhen is present within the wetlands to the north of the berm. Our experience, derived from observations made at numerous construction projects in the Hawaiian Islands, indicates that waterbirds adapt quickly to construction noise, if in fact they need to adapt at all. Typically, the biggest issue is that they are curious and will wander into active construction areas, where by accident, harm can occur.

SECTION 4. RECOMMENDATIONS

Potential impacts to trust resources can be minimized to the maximum extent practicable by avoiding adjacent wetlands, minimizing entry into wetlands, and ensuring that wetland associated species, such as the Mariana Common Moorhen, are not deleteriously impacted by the enhancements to the pipeline.

Erecting fencing on the north side of the Project site would ensure that waterbirds present in the wetland would be deterred from entering construction area(s). A temporary fence should be placed along the base of the berm (at the edge of the wetland) to the north (or at the edge of the construction site) and designed to reduce the opportunity for waterbirds to walk around at either end. Fencing should be between 1 and 2 m (yds) high. Weight or bury the toe of the fence so that the birds cannot get under the fencing. We suggest standard plastic or geotech dust fencing material for this application.

SECTION 5. CONCLUSIONS

By implementing the minimization measure identified in Section 4, the construction and subsequent operation of this Project will likely impact, but not adversely impact (NLAA), the resident endangered Marianna Moorhen population present in adjacent wetland habitat.

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Appendix A.

Vegetation tables for tree snail survey plots.

APPENDIX A1 – BERM SOUTH SIDE (SASA BAY) STATIONS

STATION:	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Target snails																					
African snail present														✓					✓	✓	
NO tall vegetation								x													X
Abundance of ants																					
Cocos nucifera	✓				✓												✓			✓	
Colubrina asiatica																					
Hibiscus tiliaceus	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓				✓	✓				
Morinda citrifolia																					
Carica papaya																					
Nephrolepis hirsutala																					
Pandanus tectorius					✓																
Bambusa vulgaris																			✓		
Chromolaena odorata						✓															
Leucaena leucocephala	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				✓	✓		✓	✓	✓	
Spathodea campanulata	✓				✓	✓	✓	✓										✓	✓	✓	
Inocarpus fagifer	✓																				
Tournefortia argentea					✓																
Tabebuia pentaphylla																✓					
Pluchea indica	✓	✓				✓						✓									
Mutingia calabura															✓						
Mikania scandens									✓										✓		
Arundo donax		✓				✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Saccharum spontaneum		✓	✓	✓	✓	✓	✓			✓	✓	✓	✓	✓		✓		✓			
Casuarina equisetifolia											✓	✓		✓							
Rhizophora mucronata	✓																				

APPENDIX A2 – BERM NORTH SIDE (PITI) STATIONS

STATION:	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Target snails																					
African snail				✓		✓	✓			✓						✓				✓	
No tall vegetation	X	X																			X
Notable abundance of ants							✓		✓	✓			✓		✓						
Cocos nucifera																					
Colubrina asiatica																					
Hibiscus tiliaceus					✓	✓	✓	✓	✓		✓	✓	✓	✓					✓	✓	
Morinda citrifolia																					
Carica papaya																				✓	
Nephrolepis hirsutala																					
Pandanus tectorius																					
Bambusa vulgaris																✓	✓		✓		
Chromolaena odorata																					
Leucaena leucocephala					✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Spathodea campanulata									✓						✓						
Inocarpus fagifer																					
Tournefortia argentea																					
Tabebuia pentaphylla													✓								
Pluchea indica													✓								
Mutingia calabura																					
Mikania scandens							✓			✓						✓	✓	✓			
Arundo donax				✓		✓	✓			✓	✓	✓	✓	✓	✓	✓		✓			
Saccharum spontaneum			✓	✓		✓		✓			✓	✓	✓	✓							
Casuarina equisetifolia																					
Rhizophora mucronata																					

Legend:

- ✓ - plant species present at the station;
- ✓- one or two plant species most abundant at station;
- **X** – No tall (>0.5 m) vegetation present at station; usually a road or mowed area.
- **x** – a portion of the survey area, laid out as described, is mowed lawn.

Appendix B.

Authors' Resumés

Author's Resumé

ERIC B. GUINTHER

Eric Guinther is the CEO of *AECOS* Inc. and has been conducting environmental studies with the company throughout the Pacific for 46 years. His responsibilities at *AECOS* include corporate and project management, conducting botanical surveys, consulting on water quality and ecological projects, and production of environmental survey reports. He edits most of the reports prepared by the other *AECOS* biologists.

Mr. Guinther's educational background includes geology and botany in addition to his primary field of invertebrate zoology. He received a degree in biology from the University of the Pacific in 1965 and undertook graduate studies in zoology at the University of Hawaii. The latter included a number of detailed studies on atolls and non-marine aquatic environments, such as baraquois and anchialine pond systems. In the last decade Mr. Guinther has been involved mostly with conducting surveys assessing the distribution of terrestrial and wetland plants to document potentially sensitive species (native or listed species) and prepare wetland inventory/delineation reports.

Mr. Guinther's experience includes both terrestrial and marine realms. He conducts terrestrial vegetation surveys, wetland delineations, aquatic wildlife surveys in and around streams, and assesses various project impacts on wetlands, streams, and coastal marine waters. Recent projects underway or completed include wetlands inventories for the U.S. Navy around all of Pearl Harbor and on all Navy properties on Guam and Tinian, numerous botanical surveys for private clients on Lanai, Maui, Hawaii, Oahu, and Kauai, including the Auwahi and the Lana'i windfarm projects. He was a technical advisor to the TMDL studies for Kawa, Kaneohe, and Waikele streams funded by the State of Hawaii, Dept. of Health, and is recently served as botanist for stream improvements under an Army Corps project involving Honolulu urban stream (Manoa and Palolo streams) and an assessment of the impacts of invasive plants on Kawai Nui Marsh on windward Oahu. More recently, he has completed a review of studies and surveys relevant to the Ala Wai watershed and the ACOE project.

Mr. Guinther has conducted marine, terrestrial, and coastal zone surveys for *AECOS* throughout the Hawaiian Islands and in many parts of the western and central Pacific, including Guam, American Samoa, Kwajalein Atoll, Canton Atoll, Fanning Atoll, Christmas Island, Yap, Saipan, Tinian, Palau, and Japan.

He is an active participant at Na Pohaku o Hauwahine in Kailua, a community project to restore native vegetation and marsh habitat in Kawai Nui Marsh. He is very interested in developing the potential of the World Wide Web as an information source, and has served as webmaster for the National Association of Environmental Professionals (NAEP), Hawaii AEP, Kawai Nui Heritage Foundation, Ahahui Malama I Ka Lokahi, *AECOS* Inc., Central Pacific Island Environments (CPIE), and Koolau.net community watersheds web site). Mr. Guinther is past-president of HAEP, the Hawaii Chapter of the National Association of Environmental Professionals (NAEP). He is certified in First Aid & CPR. He has completed the 40-hour basic health and safety training required for hazardous waste workers under OSHA 1910.120.

Author's Resumé

Reginald E. David

Over the past 30 years I have worked as a terrestrial ecologist concentrating on vertebrate species in Hawai'i and the Tropical Pacific. I specialize in avian species with an emphasis on endangered species.

Experience Summary

Between 1986 and the present I have conducted over 1200 faunal surveys for the USFWS, the State of Hawai'i, and numerous private concerns, on all of the main Hawaiian Islands as well as on Midway, Nihoa, Necker, and Kure Atolls. I have extensive field experience in New Zealand, Tahiti, Republic of Kiribati, Guam, Saipan, Tinian, Gilbert Islands, Vanuatu, Republic of Belau, Eastern Siberia, Korea and the western United States. I have conducted fieldwork on all of the Navy Facilities on Guam. I am also experienced in the radar tracking of seabirds and bats as well as ultrasonic and thermal imaging censusing of bats. I have authored/co-authored over 25 peer- reviewed papers, one book and over 600 technical reports on birds and mammals. I am also the co-discoverer of a seabird new to science, which has recently been described as Bryan's Shearwater (*Puffinus bryani*).

I have a good working knowledge of USFWS, State of Hawai'i, and the Federal Department of Transportation environmental laws and regulations. I am experienced in preparing Biological Assessments (BA's) required under Section "7" of the Endangered Species Act (ESA) and in negotiating mitigation under Section "7" of the ESA with the USFWS as well as under section "10" of the ESA and Hawaii State Statute 195D. I also have experience in preparing Natural Resource Management Plans (NRMP's) and DoD, Integrated Natural Resource Management Plans (INRMP's) as well as State of Hawai'i Section 343 Environmental Assessments.

Related Activities:

- Hawaii Bird Records Committee: Vice-chair – 2017- present
- State of Hawaii Department of Land and Natural Resources, Natural Areas Reserve Commission (NARS) Commissioner: 1999 – 2004
- US Fish & Wildlife Service, 'Alala Recovery Team Member: 1994 – 2016
- National Audubon Society: Elected Board of Directors member, representing Alaska, Hawaii and the Marianas: 1993-1996
- Hawaii Audubon Society: Board of Directors member: 1989 - 1996, 1998
- Hawai'i Audubon Society: Treasurer 1998
- Hawai'i Audubon Society: President 1990-1994

I have also served on the following committees:

- US Fish & Wildlife & DLNR, Newell's Shearwater Working Group
- US Fish & Wildlife & DLNR, Hawaiian hoary bat Technical Working Group
- The Mauna Kea Management Board – Environmental Committee
- US Fish & Wildlife & DLNR, Hawaii Endangered Waterfowl Recovery Team Advisory Committee
-

- **Professional Experience**

A 56-page list of my publications, and technical reports is available upon request.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Pacific Islands Fish and Wildlife Office
300 Ala Moana Boulevard, Room 3-122
Honolulu, Hawaii 96850

In Reply Refer To:
01EPIF00-2020-I-0497

November 19, 2020

Justin N. Fujimoto
Natural Resource Specialist
Naval Facilities Engineering Command Pacific
808-472-1407
Honolulu, Hawaii

Subject: Naval Base Guam Fuel Tie In MILCON P661

Dear Mr. Fujimoto:

Thank you for your letter of September 18, 2020, asking for concurrence on your determination that the Naval Base Guam (NBG) Fuel Tie In MILCON P661 project, may affect, but is not likely to adversely affect the threatened Mariana common moorhen, *Gallinula chloropus guami* pursuant to the Endangered Species Act (ESA) of 1973 [16 U.S.C. 1531-1544 *et seq*.], as amended.

Project Description
The Proposed Action (MILCON P-661) would replace an existing [redacted] Navy/Commercial petroleum, oil, and lubricant POL tie-in. The new tie-in facility would be located to the southeast of the existing tie-in within the pipeline easement causeway between Highway 18 and Highway 1, in the vicinity of Apra Harbor, Guam. The current Navy/Commercial tie-in was identified [redacted] due to its location and visibility directly adjacent to Highway 18, the public roadway that leads out to Dry Dock Island. This new location would [redacted] provide sufficient setbacks from public roadways. The new tie-in would be constructed in sheltered vaults to further reduce its visibility. The Proposed Action is part of a broader Navy initiative to [redacted] increase the resilience of critical infrastructure serving installations.

Action Location
The existing Navy/Commercial tie-in is [redacted] sited along the south side of Highway 18, where the Highway intersects with the Navy and Commercial pipeline easement causeway. The proposed hardened tie-in facility (preferred alternative) would be located [redacted] to the southeast on the causeway. The project area for the proposed action includes the entire causeway from Highway

18 to Highway 1 due to the supporting infrastructure that would be located along the causeway (Figure 1).

To the east side of the project there is breeding habitat for the Mariana common moorhen, *Gallinula chloropus guami* and to the west side of the leveed road is a tidal mangrove forest which drains into Sasa bay.

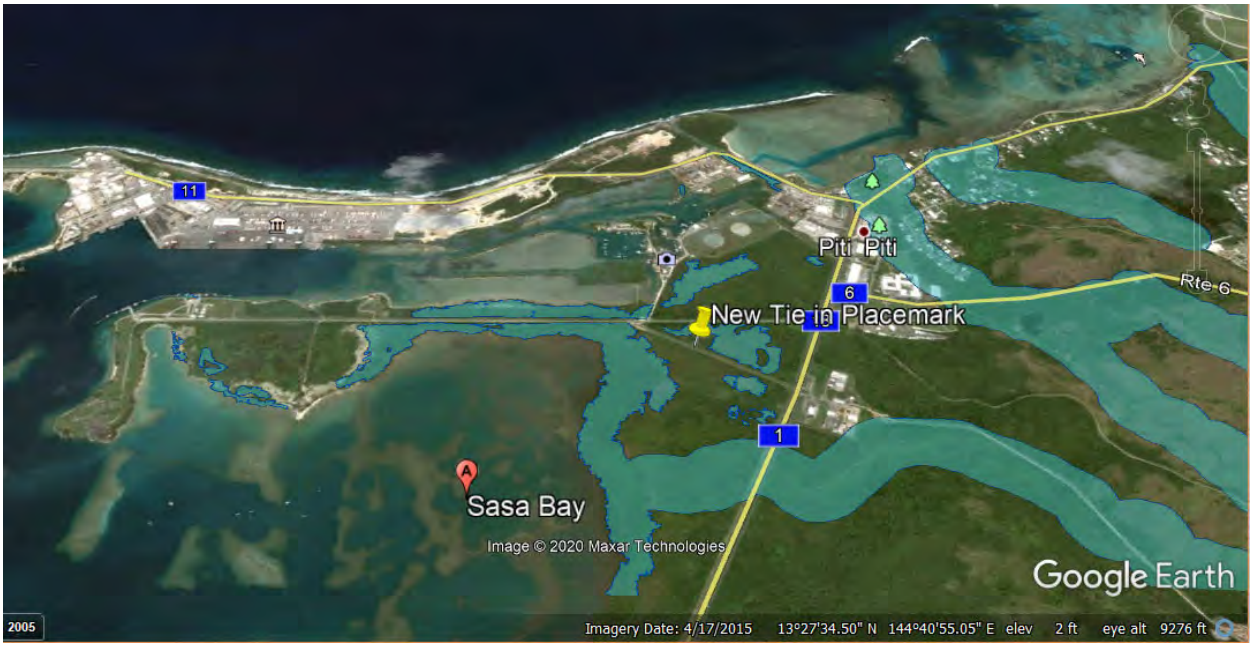

Figure 1. The blue area indicates Mariana common moorhen habitat


Figure 2. Project Vicinity Map and construction elements.

Avoidance and Minimization Measures
The following conservation measures will be implemented at the project site to avoid and minimize effects to the species.

General construction conservation measures:
1. The Service will be notified prior to project initiation and provided with the results of pre-construction waterbird surveys.
2. The contractor will have a biological monitor on site for the duration of construction to ensure protected wildlife will be avoided during the construction phase of the project.
3. The biological monitor will be provided a fact sheet with color photographs of threatened or endangered species in the action area, and a number to call if a sighting occurs. The biological monitor would keep track of contractors on site, potential Threatened and Endangered species sightings, and make weekly reports to NAVFAC Marianas.
4. If a severe weather event occurs that could potentially disperse wildlife to the area, surveys will be conducted prior to resuming construction.

Specific measures for the Mariana common moorhen:
5. A biological monitor will conduct surveys for moorhen adults, juveniles, and nests at the project site prior to project initiation. Repeat surveys again within 3 days of project initiation and after any subsequent delay of work of 3 or more days.
6. If a nest and/or brood is present, construction activities will cease and the US Fish and Wildlife Service (USFWS) will be contacted immediately. Activities may not begin without USFWS assessing the situation.
7. A 100-foot (30 meter) buffer will be established and maintained around all active nests and/or broods until the chicks/ducklings have fledged. No potentially disruptive activities or habitat alteration should occur within this buffer. A biological monitor(s) will be present on the project site during all construction or earth moving activities to ensure that individual moorhens and their nests are not adversely impacted.
8. If a moorhen is observed within the project site, or flies into the site while activities are occurring, the biological monitor shall halt all activities within 100 feet (30 meters) of the individual(s). Work should not resume until the listed waterbird(s) leave the area on their own accord.
9. Temporary fencing will be erected around construction sites to deter moorhens from entering. Silt fences will also be used around excavated and cleared sites for erosion control and to deter moorhens.
10. No pre-construction vegetation clearing, grubbing, groundwork, or commencement of construction activities that may impact the wetland areas during the peak Mariana moorhen nesting season (July to November)
11. A post-construction report will be submitted to the Service with 30 days of the completion of the project. The report will include the results of the moorhen surveys, the location and outcome of documented nests, and any other relevant information.

In the past five years there have been three different oil spills on Guam one that happened in August of 2017 at the Sasa Valley Fuel Farm of which had 8 different spill locations and was similar in project description to NBG Fuel Tie In MILCON P661. The Sasa Valley Fuel Farm spill was not reported for several months after the incident occurred.

Because of the recent history of oil spills on Guam the following assurances have been added to protect the habitat and wildlife from oil and contaminate spills:

-An absorbent barrier for oil/petroleum product will be used to contain the construction site from entering the wetland and shoreline long the berm.

- Methods to remove petroleum in the existing pipe will be provided to the Service. The current plan is to use a pigging that will push the remaining material within the pipe to the other end before plugging. At either end of the close off valve, containment barrier will be established and any material caught will be disposed at on upland disposal site.

-Draft plans of the spill plans, specifically the 404 permit and individual permit will be sent to the FWS contaminant specialist for review.

-The EA will be available for the Services review during the public review period. A notice of the review period will be provided to the Service before the EA is available.

Consequences of the Action
Mariana common moorhen: Because the species are adjacent to the work site, construction work will be halted or postponed in that area; construction workers will be instructed not to harm or harass the species; work will be halted if the bird is present within a 100 feet of the worksite; a barrier to oil spills and a fence be installed to deter birds from entering the work site; along with further cooperation with USFWS on specific spill mitigation and prevention methods will be done to minimize impacts, impacts to the bird are expected to be extremely unlikely to occur. Because adverse effects are extremely unlikely to occur; they are discountable and therefore not likely to adversely affect the Mariana common moorhen.

Conclusion
Based on the proposed action, our analysis indicates impacts of the proposed action, to the Mariana common moorhen are discountable as described above. The USFWS therefore concurs with your determination that the proposed project NBG Fuel Tie In MILCON P661 Guam, may affect, but is not likely to adversely affect the Mariana common moorhen, *Gallinula chloropus guami.*

Thank you for your time and working towards conserving threatened and endangered species. We look forward to coordinating with you on the Storm Water Pollution Prevention Plan (SWPPP) to facilitate ease of response and minimize impact to the species. The Pacific Islands Fish and Wildlife Office is available to assist in the evaluation of specific project documentation related to compliance with the ESA requirements. If you need further assistance, please contact Heather Benedict at heather_benedict@fws.gov.

Sincerely,

JACQUELINE FLORES

Digitally signed by JACQUELINE FLORES
Date: 2020.11.19 14:52:53 +10'00'

Jacqueline Flores
Mariana Islands Team Manager

Cc: Jay Gutierrez, Division of Aquatics and Wildlife Resources

Appendix B
Coastal Consistency Determination

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DEPARTMENT OF THE NAVY
U.S. NAVAL BASE GUAM
PSC 455 BOX 152
FPO AP 96540-1000

5090
Ser EV/0630
September 9, 2021

Mr. Tyrone J. Taitano
Director
Guam Coastal Management Program
P.O. Box 2950
Hagåtña, Guam 96932

Subject: NOTIFICATION OF CONSISTENCY DETERMINATION FOR NAVY/COMMERCIAL TIE-IN HARDENING (MILCON P-661), NAVAL BASE GUAM

Dear Mr. Taitano,

U.S. Naval Base Guam is proposing to replace an existing Navy/Commercial Petroleum, Oil, and Lubricant (POL) tie-in with a new hardened tie-in facility. The new tie-in facility would be located to the southeast of the existing tie-in within the pipeline easement causeway between Highway 18 and Highway 1, in the vicinity of Apra Harbor, Guam.

The tie-in facility serves a network of POL facilities and users including lines connecting terminal facilities at the commercial wharf and the Navy wharves, Piti Power Plant, and the Sasa Valley Tank Farm. The new tie-in would be constructed in sheltered vaults to further reduce its visibility. The Proposed Action is part of a broader Navy initiative to increase the resilience of critical infrastructure serving installations. The Navy has determined that the proposed activity will be consistent to the maximum extent practicable with mitigating any unintended effects on the Guam Coastal Zone, per 15 CFR 930 Section 930.35.

The purpose of the Proposed Action is to continue to facilitate the safe and adequate supply of POL commodity from Navy and commercial fueling ports to Navy and commercial storage facilities. The tie-in serves as an alternate fuel supply source between the Navy and commercial systems and it will increase the resilience of the POL infrastructure to ensure the capability of distributing and dispensing fuel during a contingency.

Pursuant to Section 7 of the Endangered Species Act, the Navy has consulted with the U.S. Fish and Wildlife Service (USFWS) regarding the Preferred Alternative. The Navy determined that Preferred Alternative may affect, but is not likely to adversely affect the Mariana Common Moorhen in a letter to the USFWS dated September 17, 2020. The USFWS concurred with the Navy's determination in a return letter dated November 19, 2020.

In July 2008, the Commander, Navy Region Marianas entered into a Programmatic Agreement (PA) with the Advisory Council on Historic Preservation and the Guam Historic Preservation Officer regarding Navy undertakings on Guam. Per Stipulation VII.A of the PA, the Preferred Alternative was reviewed by Navy Personnel and they determined that the

undertaking is located in an area identified as having a low probability for archaeological resources, and that it does not have the potential to cause effects to historic properties. Therefore, no further review under the PA or Section 106 of the National Historic Preservation Act is required. In addition, the Navy is preparing a Draft Environmental Assessment (EA). The Draft EA will be made available for public review and comment.

The Navy has completed an effects test per 15 CFR Part 930 Section 930.33(a)(1). The Navy assessed reasonably foreseeable direct and indirect effects on Guam's coastal use or resources, reviewed relevant management program enforceable policies, and determined that the project has foreseeable coastal effects to Guam's defined coastal zone per 15 CFR 930, Section 930.35. This notification of consistency determination is based on:

1. The proposed federal development is consistent with existing land uses as military mission support.

2. The use of Best Management Practices would be implemented to minimize potential environmental effects.

3. The proposed activities are similar to previous Navy activities that have been determined to be either consistent with, or have no effects, on coastal resources.

We are hopeful that a response from Bureau of Statistics and Plans can occur within 30 days or less from receipt of this package. However, if no response is received from your office within 60 days, the Navy shall presume concurrence with the consistency determination per 16 CFR Section 930.35(c).

Should you have any questions or require additional information about this proposed project, please contact Mr. Jeffrey Lambrecht, Environmental Planner, NAVFAC Marianas at (671) 339-2587 or email: jeffrey.lambrecht@fe.navy.mil.

Sincerely,

Ed Moon

E.E. Moon
Installation Environmental Program Director
By Direction of the Commanding Officer

Enclosures: 1. Project Description
2. Guam CZM Program Assessment Form
3. USFWS Response Letter, Endangered Species Act Consultation (11-19-20)

Navy-Commercial Tie-In Hardening (MILCON P-661)

Joint Region Marianas, Guam

Project Description

Navy Base Guam (NGB) proposes to replace an existing Navy/Commercial petroleum, oil, and lubricant (POL) tie-in, with a new, hardened tie-in facility. The new tie-in facility would be located to the southeast of the existing tie-in within the pipeline easement causeway between Highway 18 and Highway 1, in the vicinity of Apra Harbor, Guam (Figure 1).

Background

The Proposed Action is part of a broader Navy initiative to increase the resilience of critical infrastructure serving U.S. Department of Defense (DoD) installations on Guam. The existing Navy/Commercial tie-in was identified due to its location and visibility directly adjacent to Highway 18, the public roadway that leads out to Dry Dock Island. The Navy/Commercial Tie-In facility serves a network of Petroleum Oil Lubricant (POL) facilities and users including lines connecting terminal facilities at the commercial wharf and the Navy wharves, Government of Guam's (GovGuam) Piti Power Plant, and the Navy's Sasa Valley Tank Farm. The Navy proposes to harden the infrastructure to make it less susceptible to damage from a Design Basis Threat (DBT). The project would also provide Anti-Terrorism Force Protection (ATFP) features in accordance with DoD Minimum Anti-Terrorism Standards for Buildings.

The existing Navy/Commercial tie-in is located along the south side of Highway 18, where the Highway intersects with the Navy and Commercial pipeline easement causeway. The proposed hardened tie-in facility would be located to the southeast on the causeway. The project area for the Proposed Action includes the entire causeway from Highway 18 to Highway 1 due to the supporting infrastructure that would be located along the causeway (Figure 2). The proposed new hardened tie-in facility would replace the Navy-owned tie-in piping at the existing tie-in facility. Once the construction of the new tie-in facility is completed, the Navy-owned piping at the existing tie-in facility would be capped and buried or removed.

The Proposed Action would be constructed on land that is currently owned by GovGuam. The use of the causeway for POL pipelines is provided by two separate but parallel easements. The 40-foot wide Navy pipeline easement runs along the north side of the causeway, and the 30-foot wide commercial (TriStar) pipeline easement runs along the south side of the causeway. The Navy and commercial easements are separated by a 5-foot wide gap of GovGuam-owned land that is not encumbered by an existing easement. The Proposed Action includes infrastructure and site improvements that will be constructed on both easements and the unencumbered GovGuam land. Therefore, the construction of the Proposed Action and future access to the facilities will require additional rights-of-entry, easements, and/or other agreements between the GovGuam, the Navy, and TriStar.

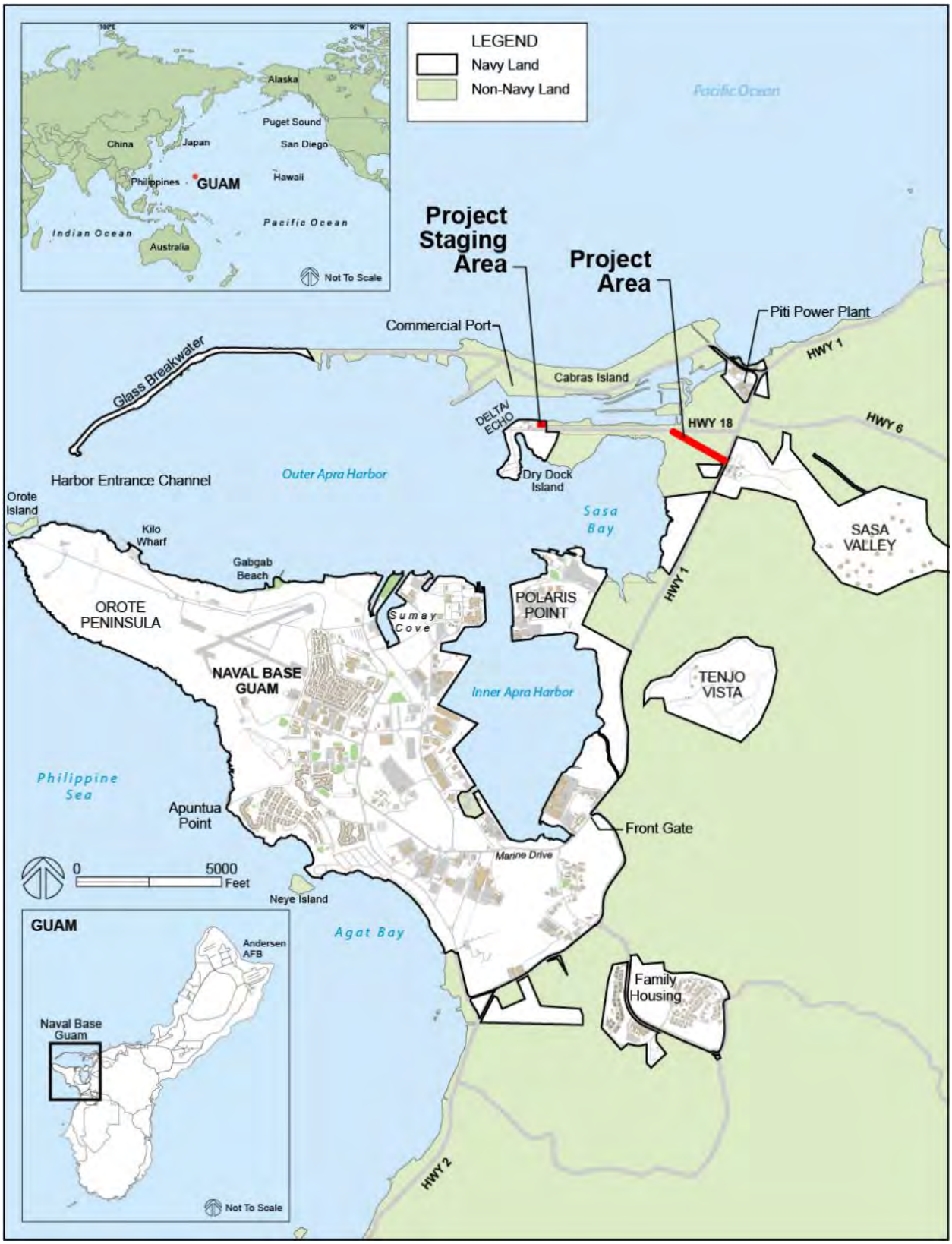

Figure 1: Location Map

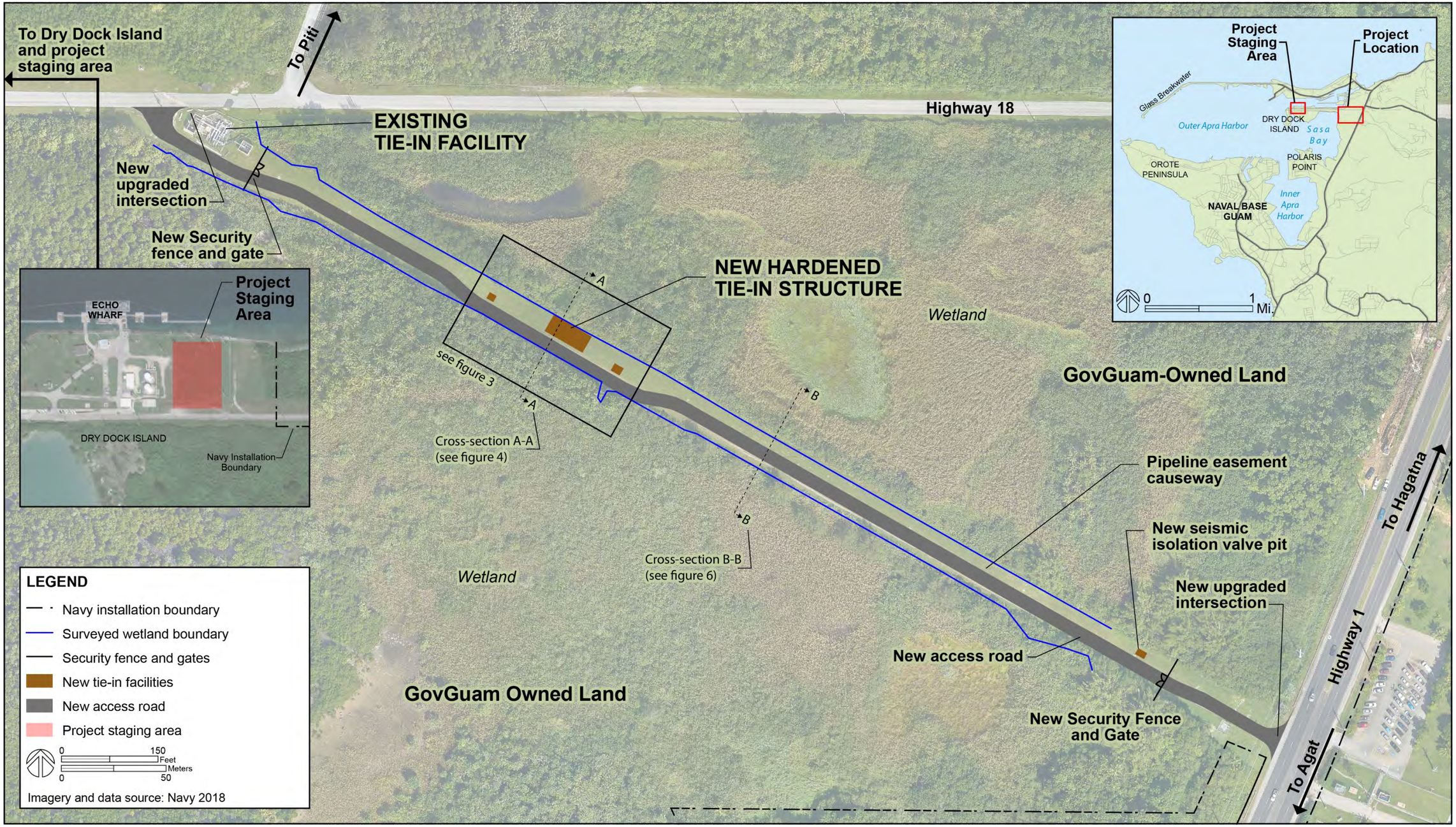

Figure 2: Project Vicinity Map

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Project Components

Temporary Bypass of Navy-Owned Pipeline

During the initial stage of construction, the Navy would install bypass pipelines to route the existing Navy pipelines around the proposed new hardened tie-in facility. This would ensure that there would be minimal impact to POL service during construction. The bypass pipelines would be routed along the southern portion of the causeway to avoid the area required for the construction of the new hardened tie-in facility.

Construction of the new hardened tie/in facility

The new hardened tie-in facility would be located southeast along the causeway from the existing tie-in. The new hardened tie-in structure would house the valve vault and tie-in equipment to the Navy pipelines and would span approximately half of the causeway (Figures 3 and 4). The new structure has exterior dimensions of approximately 56 feet by 26 feet with a floor area of approximately 1,456 square feet. The structure will be approximately 25.5 feet tall, and the valve vault would have a pit depth of approximately six feet below finished grade (approximately six feet above mean sea level). The new hardened tie-in structure would be constructed with reinforced concrete roof slabs and walls supported on concrete piles. Openings for the facility will consist of a system of hardened doors and louvers.

Seismic Isolation Valve Pit

An additional seismic isolation valve pit would be constructed on the POL causeway near Highway 1. The seismic isolation valves would serve Navy-owned lines, so the pit would be located within the Navy easement. Construction of these valves may occur concurrently with other project tie-ins to minimize pipeline shutdowns.

Burial of Navy piping and demolition of select structures at the existing tie-in facility

The existing tie-in facility consists of two concrete block, open-topped vaults that are approximately 17 feet by 28 feet and 17 feet by 18 feet respectively. The entire complex is approximately 60 feet by 80 feet and has site walls and a perimeter fence. The proposed new hardened tie-in facility would replace the Navy-owned tie-in piping at the existing tie-in facility. Once the construction of the new tie-in facility is completed, the concrete walls of the existing Navy tie-in facility would be removed, and the existing valves would be replaced with straight pipe and then buried.

Site improvements

A 20-foot wide (minimum) paved access road would be provided for the entire length of the fuel easement causeway, from its intersection with Highway 18 to Highway 1 (Figures 5 and 6). The access road would allow for the safe operation and maintenance of the project site as well as providing fire department access. Construction of the road would require earthwork, fill, and grading. Newly graded areas and areas disturbed during construction would be revegetated with grass. The road section would be developed in a way that stormwater runoff drains to vegetated swale areas. The new access road would include new upgraded intersections at Highway 18 and Highway 1, which would require the associated approvals and coordination with GovGuam Department of Public Works.

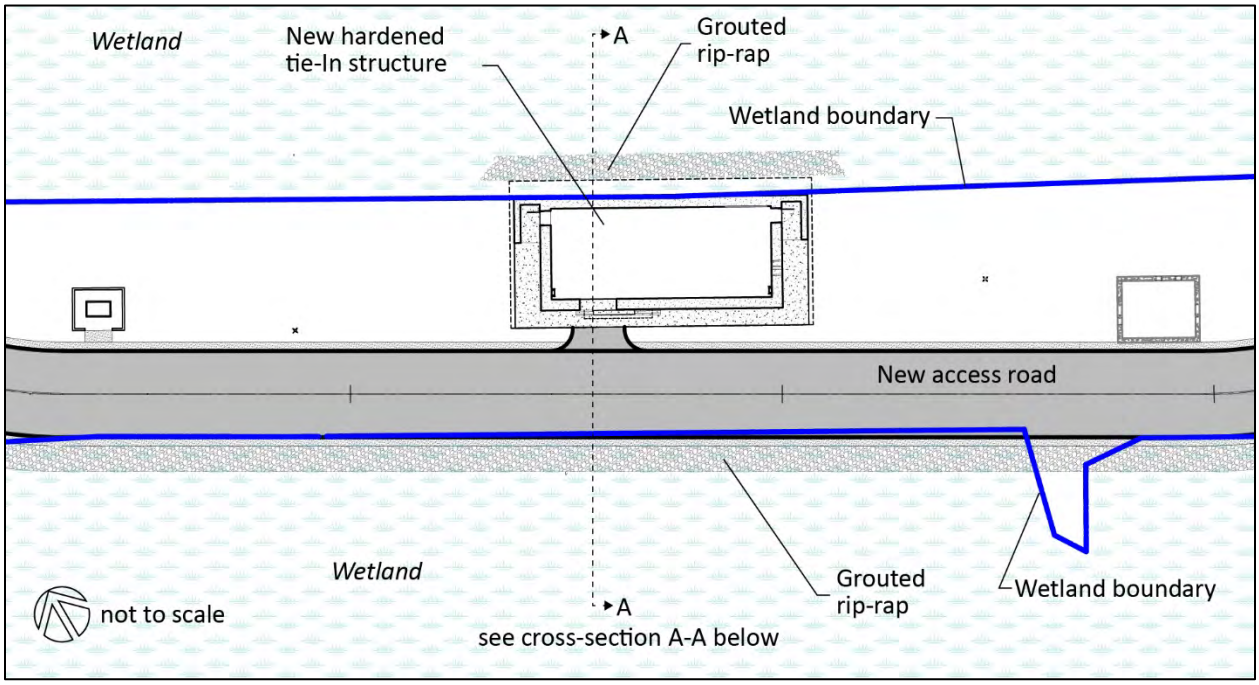

Figure 3: Site plan at the new hardened tie-in facility

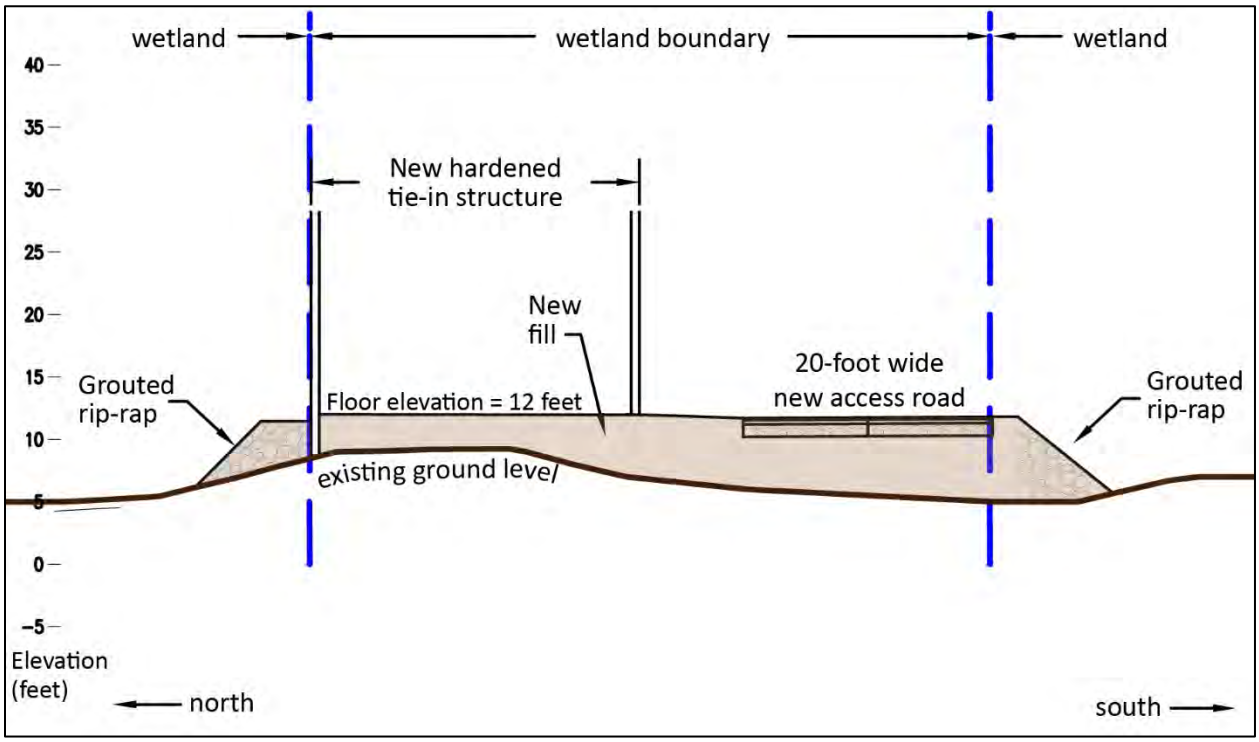

Figure 4: Cross-section A-A at the new hardened tie-in facility

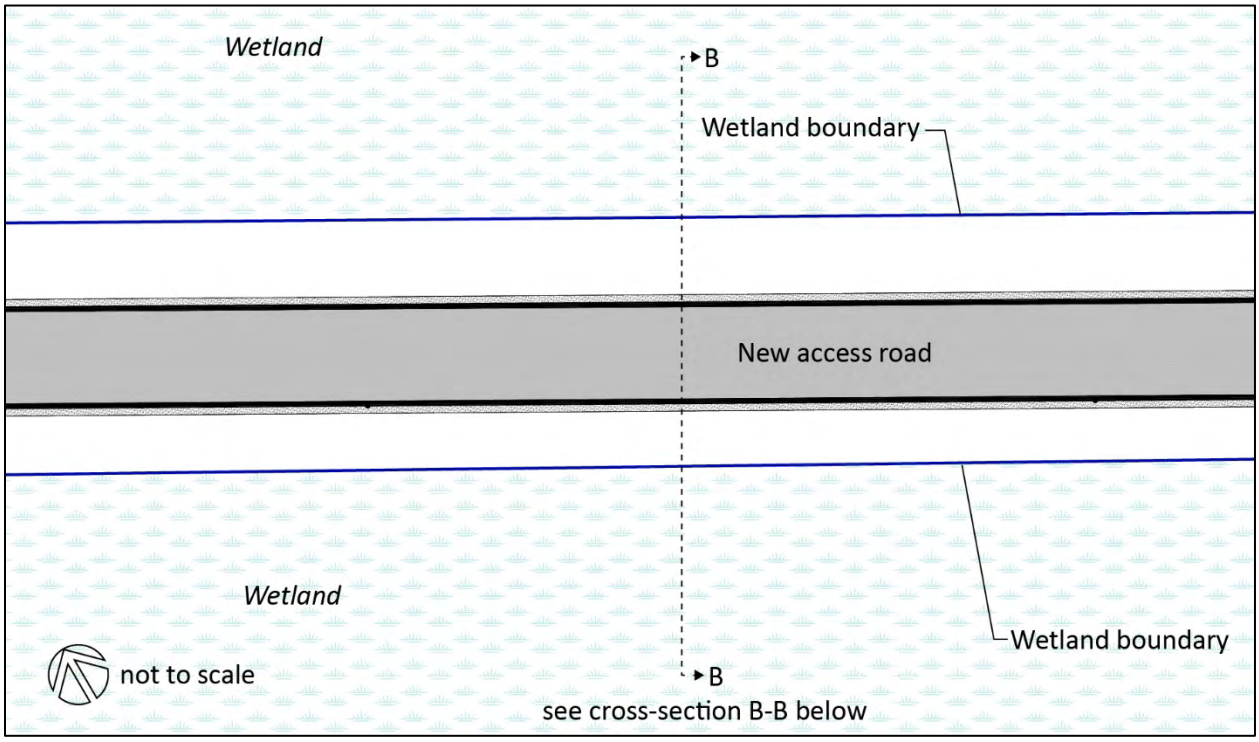

Figure 5: Typical site plan for the new access road

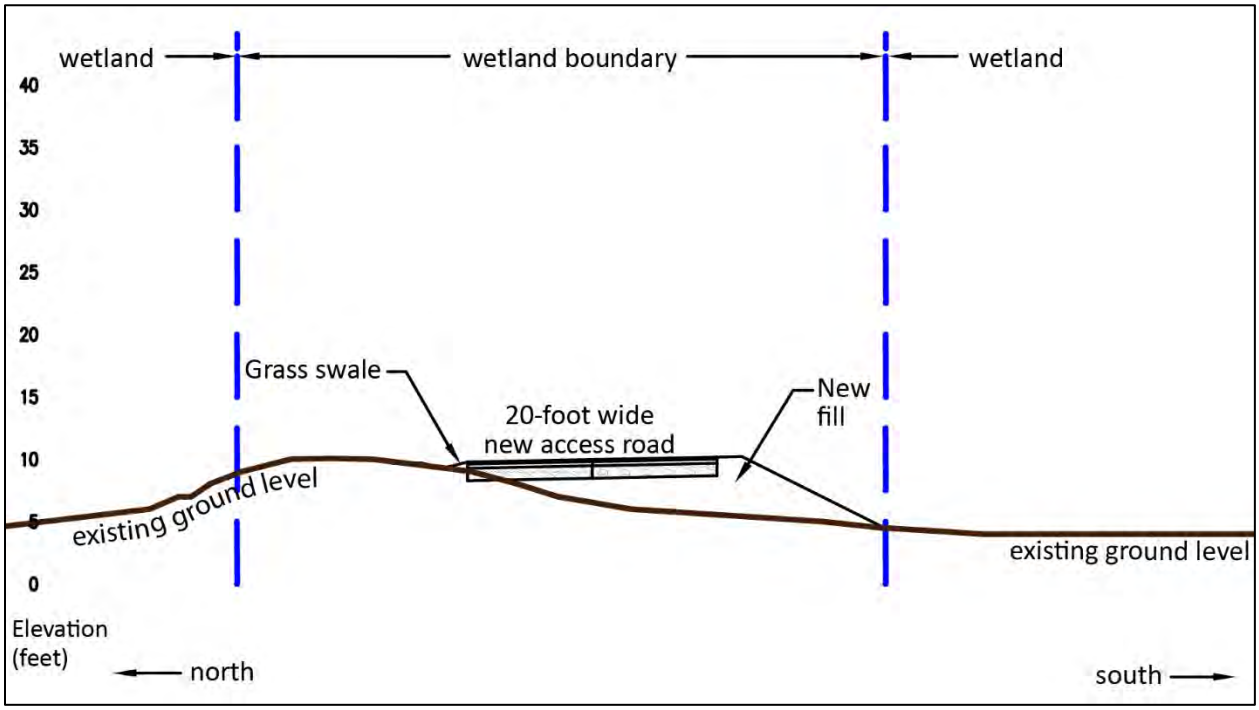

Figure 6: Cross-section B-B, typical cross-section for the new access road

For most of the causeway, the access road would run along the middle of the causeway. However, the road would be required to run along the south side of the causeway in the vicinity of the new hardened tie-in structure (Figures 3 and 4). Due to the limited width of the causeway in total, and the finished floor elevation requirements of the new Navy valve vault, the embankments along both the roadway and the hardened tie-in structure would be stabilized in this location. This would include the installation of approximately 400 linear feet of grouted rip rap along the southern causeway embankment (along the road), and 100 linear feet of grouted rip-rap along the northern causeway embankment (along the hardened tie-in structure). Construction of the grouted rip-rap embankment would extend into the adjacent wetland areas.

The access road would also be required to run along the south side of the causeway in the vicinity of the existing tie-in facility near Route 18. The southern causeway embankment (adjacent to the proposed access road) would need to be stabilized at this location with approximately 150 linear feet of grouted rip-rap. In this area, the adjacent wetland is not located directly adjacent to the causeway, so the construction of the grouted rip-rap embankment would not extend into the wetland areas.

To provide the necessary security for the new tie-in facility, a vehicle crash-resistant fence and lockable gate would be provided at each entry point of the access road. One security fence and gate would be located approximately 150 feet southeast of the intersection of the causeway and Highway 18. The other security fence and gate would be located approximately 200 feet northwest of the intersection of the causeway and Highway 1. The security fence and gate would be at least seven feet above finished grade. Footings for the fence and gate would extend approximately 3.5 feet below grade. Fencing would be extended 5 feet past the last footing on either edge of the causeway into the adjacent vegetation. Extending the fence would provide adequate security but avoid the need to place footings in the adjacent wetland. No fencing and gate will be provided around the hardened structure itself. Pole-mounted roadway lighting shall be provided from the two entrance gates to the hardened structure. Security lighting would be fully-shielded and downward facing to minimize impacts to birds.

Utility infrastructure

A new 8-inch water service line will be provided to serve the new hardened tie-in structure. This waterline will supply two fire hydrants, an internal fire sprinkler system, and water needs of the facility. The new waterline would be buried under the new access road, and would be connected to an existing waterline along Route 18. Since the end of the line near the proposed hardened tie-in structure is considered a dead-end, an automatic flushing device would be needed at the end of the line. Water supply to the building would be provided with a water meter and backflow preventer.

No wastewater service will be required at the tie-in facility. However, the Proposed Action would involve the relocation and adjustment of an existing Collection Handling and Transport (CHT) wastewater line. The relocation and adjustment of the CHT wastewater line may require the construction of a temporary by-pass line.

Electrical utilities would include primary and secondary electrical distribution and in-ground cathodic protection for the underground piping. The electrical point of connection for the new facility will be obtained from the existing overhead primary electrical system. Primary electrical facilities would consist of underground electrical distribution system consisting of traffic-rated manholes and concrete encased duct bank that would connect to a pad mounted transformer dedicated to the new facility. From the

transformer, an underground secondary service would be provided and would terminate at an enclosed circuit breaker installed within the new hardened tie-in structure. Electrical utilities would extend along the entire length of the causeway and would also provide electricity for the two entrance gates, and for the pole-mounted roadway lighting.

New communications lines would also be housed in the concrete duct bank. New communications systems would include outside plant fiber-optic, fire alarm system, cabling and infrastructure to support the installation of security systems at the project site.

Construction Methodology

The site is long and narrow, with very little space to move around the structure as it is being built. The flat section of the causeway is approximately 31 feet wide, which provides a long (2,000 feet) but narrow laydown space during construction. The flat space is wider at each end of the causeway, and the space near Route 18, where the existing Tie-In is located, may be used for staging activity that needs to move down the causeway. A larger 20,000-square foot construction staging area would be established approximately one mile west of the project site on Navy land adjacent to Echo Wharf. The staging area is relatively far from the site and Route 18 is a public road; however, the road is straight with good visibility and there is minimal public traffic.

Site preparation would include clearing, grubbing, and earthwork. The construction site for the new hardened tie-in facility would be approximately 100 feet by 80 feet, temporarily extending 10 to 20 feet beyond the current grassy area on both sides of the existing access road. Vehicle traffic through the site would not be possible while the buried pipes are exposed and the hardened structure is being constructed. Therefore, both ends of the access road would be used extensively during construction, and would be improved by adding a six-inch layer of gravel along the entire 2,000 feet and widening it from the current six feet to 10 feet. After the new tie-in facility is completed, the new hardened structure and upgraded paved access road would be constructed.

The new hardened tie-in structure would be constructed on a series of 24-inch octagonal, prestressed, concrete piles. Equipment needed for pile installation generally consists of a crawler-mounted pile driving crane with a pile driving hammer mounted on leads fixed to the crane, and a second crane to lift and position piles during the driving. Driven pile foundations are typically installed using impact hammers. For this project, it is anticipated that a hydraulic and/or diesel impact hammer would be used for pile installation.

Due to the depth of excavation required for the proposed new-tie-in facility, dewatering would be required during construction. Sheet piles would likely to be used to limit the extent of excavation. Sheets would be driven with a vibratory hammer and would remain in place for the duration of the below grade construction. Specific dewatering methods would be determined by the contractor, but they could include a well point system or sump. Well point systems consist of pipes inserted into the ground to pump the water outside the limits of excavation. A sump is a pit dug inside the excavation area with a pump hose to remove the water. Water removed from the excavation area during the dewatering process would be routed to a detention swale within the causeway.

Construction of the Proposed Action would incorporate Leadership in Energy and Environmental Design, (LEED), Low Impact Development (LID) principles, and sustainable development concepts to achieve optimum resource efficiency, sustainability, and energy conservation.

Tie-In Operations

Once construction of the Proposed Action is completed, operations of the Navy and commercial tie-in valves would continue similar to current conditions. The Proposed Action would not affect the intensity of operations or maintenance required for the facilities. Implementation of the Proposed Action would improve the resilience and security of the tie-in facilities, which would help to minimize the potential for future disruptions to POL service.

GUAM COASTAL MANAGEMENT PROGRAM

ASSESSMENT FORMAT

DATE OF APPLICATION: September 9, 2021
NAME OF APPLICANT: Jeffrey Lambrecht, Environmental Planner for Naval Base Guam
ADDRESS: Naval Facilities Engineering System Command Marianas, ATTN: EV Jeff Lambrecht PSC Box 195, FPO AP 96540-2937

TELEPHONE NO.: (671) 339-2587 Fax No. Cell No:
E-MAIL ADDRESS: Jeffrey.lambrecht@fe.navy.mil

TITLE OF PROPOSED PROJECT: Navy-Commercial Tie-in Hardening (MILCON P-661), Joint Region Marianas, Guam

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:

DP 1 is not applicable. The project is not located within Guam's Seashore Reserve.

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:

DP 2 is not applicable. The project does not involve high impact uses such as commercial, multi-family, or resort-hotel uses. It will replace existing petroleum, oil, and lubricant (POL) transmission infrastructure and will be located within existing utility easements established for POL transmission purposes.

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:

DP 3 is not applicable. The project does not involve new development in a rural district. It would increase the resilience of an existing utility function within an established utility easement.

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:

The proposed project is consistent with DP 4.The project supports the national interest by improving the security and resilience of existing Department of Defense (DoD)-owned fuel transmission infrastructure in existing fuel easements.

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:

The proposed project is consistent with DP 5. The project will continue an existing use and not involve new development in hazardous areas. According to Flood Insurance Rate Maps for the area, the project (which would continue an existing POL transmission function) would be located within Zone A Special Flood Hazard Areas Subject to Inundation by the 1% Annual Chance Flood, No Base Flood Elevations determined. In accordance with Guam Floodplain Management Ordinance of 2000 and National Flood Insurance Program Floodplain Management Guidelines, the finished floor elevation of the proposed hardened tie-in structure has been designed at two feet above the highest adjacent grade.

Due to its location within the floodplain, the project is subject to Presidential Executive Order (EO) 11988 Floodplain Management, which requires that federal agencies follow a prescribed decision-making process to help agencies evaluate projects that have potential impacts to or within the floodplain and how the impacts can be avoided or minimized. The Navy will comply with the requirements of EO 11988, which includes consideration of alternatives to avoid adverse effects and incompatible development in floodplains; minimization of potential harm to or within the floodplain through design or action modifications; and public notification.

The proposed tie-in facility is not located in air installation crash or noise zones and would not pose unreasonable risks to the health, safety, or welfare of the people of Guam.

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:

DP 6 is not applicable. The project does not involve housing 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:

The proposed project is consistent with DP 7. Although the project does not involve the construction of new public roadways, it would include upgrading an unpaved access road along the existing pipeline causeway with a new paved access road. Grouted riprap would be installed at several points on both sides of the causeway embankment for stabilization. Fill associated with the stabilization material would extend into delineated wetlands under U.S. Army Corps of Engineers (USACE) jurisdiction. Erosion control best management practices (BMPs) would be implemented, and conditions of the project's required National Pollutant Discharge Elimination System (NPDES) permit, Clean Water Act (CWA) 401 Water Quality Certification, and CWA Section 404 Nationwide permit would be complied with to avoid/minimize the potential for construction related sediments or pollutants to be transported to receiving wetlands and marine waters.

Improvements associated with the new facilities would be designed based on principles of low impact design and would not increase stormwater runoff from the project site into adjacent coastal resources.

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:

The proposed project is consistent with DP 8. As noted in DP 7 Transportation, the project would employ BMPs and comply with permit conditions of its required NPDES permit, CWA Section 401 Water Quality Certification, and CWA Section 404 Nationwide permit to avoid or minimize erosion and sedimentation resulting from construction activities. The project will be implemented in compliance with all applicable erosion, sedimentation, and land use regulations. Examples of erosion and sediment control BMPs include: protection of erodible soils; control of storm water runoff from the construction site; use of sediment basins; use of vegetation and mulch on soil exposed by grading; and use of silt fencing and barriers around excavated and cleared areas.

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 proposed project is consistent with RP 1. The project would not introduce major new air emissions sources or stationary air emissions sources. Short-term, temporarily-emitted air emissions (e.g., fugitive dust, combustion of fossil fuels) would be generated during the construction period. BMPs would be implemented to minimize fugitive dust during construction. Example BMPs include watering of active work areas, using wind screens, keeping adjacent paved roads clean, covering of open-bodied trucks, limiting the area that is disturbed at any given time and/or mulching or chemically stabilizing inactive areas that have been worked.

During the operational period, emissions would be limited to those generated from routine operations and maintenance activities. These activities would continue at the same intensity as the pre-construction period. Therefore, no increase in emissions is expected from the project during the operational period. Implementation of the project would upgrade the existing dirt access road to a paved road which is expected to reduce dust emissions from vehicle access and therefore improve air quality.

The proposed project is located within a nonattainment area for sulfur dioxide. Total construction sulfur dioxide emissions are expected to be below de minimis thresholds for Clean Air Act general conformity, and the Navy will prepare Record of Non-Applicability. Therefore, the proposed project would not trigger a general conformity determination under Section 176(c) of the Clean Air Act.

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:

The proposed project is consistent with RP 2. The project area is not located over a drinking water source. Construction period BMPs, such as erosion control measures and would be employed fueling construction vehicles and equipment at least 50 feet away from water, would be employed. Complying with the NPDES permit, CWA Section 401 Water Quality Certification, and CWA Section 404 Nationwide

permit conditions will also avoid or minimize pollution risks to nearby recreational waters and wetland areas.

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:

The proposed project is consistent with RP3 to the maximum extent practicable with the implementation of BMPs and Impact Avoidance and Minimization Measures. The individual fragile areas specifically identified in RP 3 are further addressed below.

Historical and Archaeological Sites. The project is located in an area of low probability for archaeological resources. The existing Navy/Commercial tie-in facility would be demolished, but it has been determined to be ineligible for listing on the National Register of Historic Places. The project was reviewed pursuant to Stipulation VII.A of the November 2008 Programmatic Agreement among Commander Navy Region Marianas, Advisory Council on Historic Preservation, and Guam Historic Preservation Officer regarding Navy undertakings on Guam, and no further review is required under Section 106 of the National Historic Preservation Act.

Wetlands and Marine Resources. The POL causeway is located within the Sasa Bay Marine Preserve. It was constructed of fill on top of existing tidal flats, bordered on both sides by wetlands that are part of the larger 146-acre Sasa Bay estuarine wetlands. A Wetland Delineation was prepared for the project in 2017 and USACE concurred with the delineated wetland boundary. Approximately 0.33 acres of clearing and grubbing would take place within the wetland areas adjacent to the causeway.

Construction activity has the potential to result in temporary impacts such as sediments or pollutants being transported to the adjacent wetlands and receiving marine waters of Sasa Bay. However, implementation of erosion control and other water quality protection BMPs would reduce or avoid this risk. An NPDES permit would be required for the construction activities, including the development of a Stormwater Pollution Prevention Plan (SWPPP). Conditions of the NPDES and USACE permits would be complied with to further reduce the potential for construction period project-related sediments and/or pollutants being transported to receiving wetlands and marine waters.

Vegetation. There are no plants of conservation concern or plants listed as threatened or endangered by the federal government or Government of Guam present in the project area, construction staging area, or in wetland areas within approximately 30 feet of the causeway. Construction activities are

likely to remove or damage existing vegetation, which consist of mowed grasses and weeds. The affected areas will be revegetated to prevent erosion and stormwater runoff.

In the long term, the proposed new paved access road would result in an increase in impervious surface on the causeway that would generate additional stormwater runoff. However, the access road would be designed using Low Impact Development principles to direct runoff to vegetated swales along the roadside to prevent erosion and promote infiltration and pollutant removal, and there would be no net increase in stormwater runoff from the project site into adjacent areas, including wetlands or the marine environment.

Terrestrial Wildlife. A survey of biological resources was conducted in 2019 for the project. No wildlife of any conservation concern or wildlife listed as threatened or endangered by either the federal government or the government of Guam are present on the POL causeway.

Noise and human activity associated with project construction would displace wildlife from the project area and adjacent areas. Additionally, the clearing of wetland vegetation along the causeway would permanently displace wildlife residing therein. However, the observed species using these areas are expected to use suitable nearby habitats for relocation and foraging. Displacement of these individuals from the project footprint and adjacent areas would not be expected to affect the survival of individuals or populations. In the long-term, the use and function of the POL causeway and the Navy/Commercial tie-in would be similar to current baseline conditions, and no impacts to wildlife are expected. MBTA-compliant outdoor security lighting would be utilized (e.g., fully-shielded and downward facing) to minimize impacts to birds.

Threatened and Endangered Species. The only species currently listed or proposed for Endangered Species Act listing that was recorded within or adjacent to the project area is the Mariana subspecies of the Mariana Common Moorhen (*Gallinula chloropus guami*). It is likely that this species nests in the wetland to the north of the POL causeway. Temporary construction fencing will be erected on the north side of the project site. The specifications and installation of the temporary fencing would be designed to ensure that waterbirds present in the wetland will not be able to enter construction areas.

Because moorhens could potentially become entrapped in excavated areas, construction materials, or harmed by construction equipment operating in the construction footprint, along construction right-of-way, or utilities berm, the Navy shall monitor for moorhens and implement the following avoidance and minimization measures for the duration of the construction phase (i.e. vegetation clearing, grading/grubbing, excavation, utilities placement, building construction, post-construction grading, etc.) of the Preferred Alternative:

1. The U.S. Fish and Wildlife Service (USFWS) shall be notified prior to project initiation and provided with the results of preconstruction waterbird surveys.
2. The contractor shall have a biological monitor on site for the duration of construction to ensure protected wildlife will be avoided during the construction phase of the project.
3. The biological monitor shall provide all on-site construction contractor personnel with a fact sheet containing color photographs of potential threatened or endangered species in the action area, and a number to call if a sighting occurs. The biological monitor will keep track of contractors on site, potential Threatened and Endangered species sightings, and make weekly reports to NAVFAC Marianas.

4. If a severe weather event occurs (i.e., typhoon) that could potentially disperse wildlife to the area, surveys will be conducted prior to resuming construction. If moorhens are present in the project area, work shall immediately cease to prevent disturbance, and the USFWS shall be contacted for further guidance.
5. A biological monitor will conduct surveys for moorhen adults, juveniles, and nests at the project site prior to project initiation. Repeat surveys again within 3 days of project initiation and after any subsequent delay of work of 3 or more days.
6. If a moorhen nest and/or brood is present, construction activities will immediately cease and the USFWS contacted for further guidance.
7. A 100-foot (30 meter) buffer will be established and maintained around all active moorhen nests and/or broods until the chicks have fledged. No potentially disruptive activities or habitat alteration should occur within this buffer. A biological monitor(s) will be present on the project site during all construction or earth moving activities to ensure that individual moorhens and their nests are not adversely impacted.
8. If a moorhen is observed within the project site, or flies into the site while activities are occurring, the biological monitor shall halt all activities within 100 feet (30 meters) of the individual(s). Work will not resume until the listed waterbird(s) leave the area on their own accord.
9. Temporary fencing (can be silt fence comprised of standard plastic or geotech dust fencing material between three and six feet high) shall be erected around construction sites to deter moorhens from entering. Silt fences will also be used around excavated and cleared sites for erosion control. The toe of the fence shall be weighted or buried so that moorhens cannot get under the fence.
10. No pre-construction vegetation clearing, grubbing, groundwork, or commencement of construction activities that may impact the wetland areas during the peak Mariana moorhen nesting season (July to November)
11. A post-construction report will be submitted to the Service with 30 days of the completion of the project. The report will include the results of the moorhen surveys, the location and outcome of documented nests, and any other relevant information.

Because moorhen observations were in areas adjacent to the work site, construction work will be halted or postponed should moorhen ingress into the project area during the construction phase; construction workers will be instructed not to harm or harass the species; work will be halted if the bird is present within a 100 foot radius of the worksite; a barrier to oil spills and a fence will be installed to deter birds from entering the work site; along with further cooperation with the U.S. Fish and Wildlife Service (USFWS) on specific spill mitigation and prevention methods will be done to minimize impacts, impacts to the bird are expected to be extremely unlikely to occur. Accordingly, the Navy determined that the Preferred Alternative may affect, but is not likely to adversely affect (NLAA) the Mariana Common Moorhen pursuant to section 7 of the Endangered Species Act of 1973 [16 U.S.C. 1531-1544 *et seq*.] in a letter to the USFWS dated September 17, 2020. The USFWS concurred with the Navy's NLAA determination in a return letter dated November 19, 2020 (see Appendix A).

Three migratory bird species that are protected under the Migratory Bird Treaty Act (MBTA) were recorded during biological survey (AECOS, 2019): the Pacific Golden-Plover (*Pluvialis fulva*), the Asiatic subspecies of Whimbrel (*Numenius phaeopus variegatus*), and Common Tern (*Sterna hirundo*). All three of these species could potentially loaf or use resources within the proposed construction footprint

areas. However, as none of these species are presently found to nest on Guam, disturbance from construction activities would not pose significant negative impacts to MBTA-protected species.

Coral Reefs. There are no coral reefs in the project area and none would be directly affected by the project. Increased sedimentation from the project's upland construction activities are very unlikely to be transported to coral reef resources in Apra Harbor because BMPs, erosion control measures, and compliance with USACE, SWPPP, and NPDES permit conditions would minimize or avoid the introduction of sediments and pollutants into adjacent waters, including at the construction staging area adjacent to Delta and Echo Piers. Operational period impacts to coral reefs are unlikely, as the use and maintenance of the new facility would be of the same intensity and frequency as the existing tie-in.

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:

The proposed project is consistent with RP 4. The project would not directly impact living marine resources such as fish, corals, sea turtles, and marine mammals. Access road design, employment of BMPs, and compliance with the NPDES permit, CWA Section 401 Water Quality Certification, and CWA Section 404 Nationwide permit conditions would avoid or minimize the low potential for pollutants or sediments generated at the project or construction staging areas during the construction or operational periods to affect coral reef areas in Apra Harbor.

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:

The proposed project is consistent with RP 5. The project site is generally surrounded by dense vegetation, and public views into the causeway are limited to those views gained at the causeway intersection with Highway 1 and Highway 18. The new tie-in facility would not be readily visible from public vantage points and would not impact any significant viewplanes or visual resources.

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:

RP 6 is not applicable. The project does not involve development of recreational facilities. It would not impede or otherwise affect Guam's existing recreational areas or facilities.

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:

RP 7 is not applicable. The project area is located within utility easements in a fuel pipeline corridor. The construction staging area is located on Navy-controlled land. Neither area provides public access to public beaches or other recreation areas.

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:

RP 8 is not applicable. The project is not located on agricultural lands.

FEDERAL CONSISTENCY

SUPPLEMENTAL INFORMATION FORM

Date: September 9, 2021

Project/Activity Title or Description: Navy-Commercial Tie-In Hardening (MILCON P-661)

Location: Piti, Guam

Other applicable area(s) affected, if appropriate: _____

Est. Start Date: April 2022 Est. Duration: 18 months

APPLICANT

Name & Title: Jeffrey Lambrecht, Environmental Planner for Naval Base Guam

Agency/Organization: Naval Facilities Engineering System Command Marianas

Address: ATTN: EV Jeffery Lambrecht PSC 455, Box 195, FPO AP

_____ Zip Code 96540-2937

Telephone No. during business hours:

A/C (671) 339-2587
A/C (___) _____
Fax (___) _____

E-mail Address: Jeffrey.Lambrecht@fe.navy.mil

AGENT

Name & Title: N/A

Agency/Organization Address: _____

Zip Code: _____

Telephone No. during business hours:

A/C (___) _____
A/C (___) _____
Fax (___) _____

E-mail Address: _____

CATEGORY OF APPLICATION (check one only)

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

TYPE OF STATEMENT (check one only) (x)

(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 _____

Contact Person _____

Telephone No. during business hours:
Area Code ( )_____
Area Code ( )_____

FEDERAL AUTHORITY FOR ACTIVITY

Title of Law__Title 10 – Armed Forces, United States Code_____
Section ___Subtitle A – General Military Law, Part IV Service, Supply, and Procurement_____

OTHER GUAM APPROVALS REQUIRED:

Agency	Type of Approval	Date of Application	Status
U.S. Fish and Wildlife Service (USFWS)	Completion of Endangered Species Act (ESA) Section 7 Informal Consultation	17 Sept 2020	USFWS issued a letter on 19 Nov., 2020, concurring with the Navy's determination, per Section 7 of the ESA, that project activities are "Not Likely to Adversely Affect" threatened or endangered species.
Guam Environmental Protection Agency (GEPA)	Clean Water Act 401 Water Quality Certification	Pending	Pending submittal of applications
U.S. Army Corps of Engineers	Clean Water Act 404 Nationwide Permit	Pending	Pending submittal of applications
Guam Environmental Protection Agency (GEPA)	Stormwater management permitting/plan approval	Pending	Pending submittal of applications

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Pacific Islands Fish and Wildlife Office
300 Ala Moana Boulevard, Room 3-122
Honolulu, Hawaii 96850

In Reply Refer To:
01EPIF00-2020-I-0497

November 19, 2020

Justin N. Fujimoto
Natural Resource Specialist
Naval Facilities Engineering Command Pacific
808-472-1407
Honolulu, Hawaii

Subject: Naval Base Guam Fuel Tie In MILCON P661

Dear Mr. Fujimoto:

Thank you for your letter of September 18, 2020, asking for concurrence on your determination that the Naval Base Guam (NBG) Fuel Tie In MILCON P661 project, may affect, but is not likely to adversely affect the threatened Mariana common moorhen, *Gallinula chloropus guami* pursuant to the Endangered Species Act (ESA) of 1973 [16 U.S.C. 1531-1544 *et seq*.], as amended.

Project Description
The Proposed Action (MILCON P-661) would replace an existing [redacted] Navy/Commercial petroleum, oil, and lubricant POL tie-in. The new tie-in facility would be located to the southeast of the existing tie-in within the pipeline easement causeway between Highway 18 and Highway 1, in the vicinity of Apra Harbor, Guam. The current Navy/Commercial tie-in was identified [redacted] due to its location and visibility directly adjacent to Highway 18, the public roadway that leads out to Dry Dock Island. This new location would [redacted] provide sufficient setbacks from public roadways. The new tie-in would be constructed in sheltered vaults to further reduce its visibility. The Proposed Action is part of a broader Navy initiative to [redacted] increase the resilience of critical infrastructure serving installations.

Action Location
The existing Navy/Commercial tie-in is [redacted] sited along the south side of Highway 18, where the Highway intersects with the Navy and Commercial pipeline easement causeway. The proposed hardened tie-in facility (preferred alternative) would be located [redacted] to the southeast on the causeway. The project area for the proposed action includes the entire causeway from Highway

18 to Highway 1 due to the supporting infrastructure that would be located along the causeway (Figure 1).

To the east side of the project there is breeding habitat for the Mariana common moorhen, *Gallinula chloropus guami* and to the west side of the leveed road is a tidal mangrove forest which drains into Sasa bay.

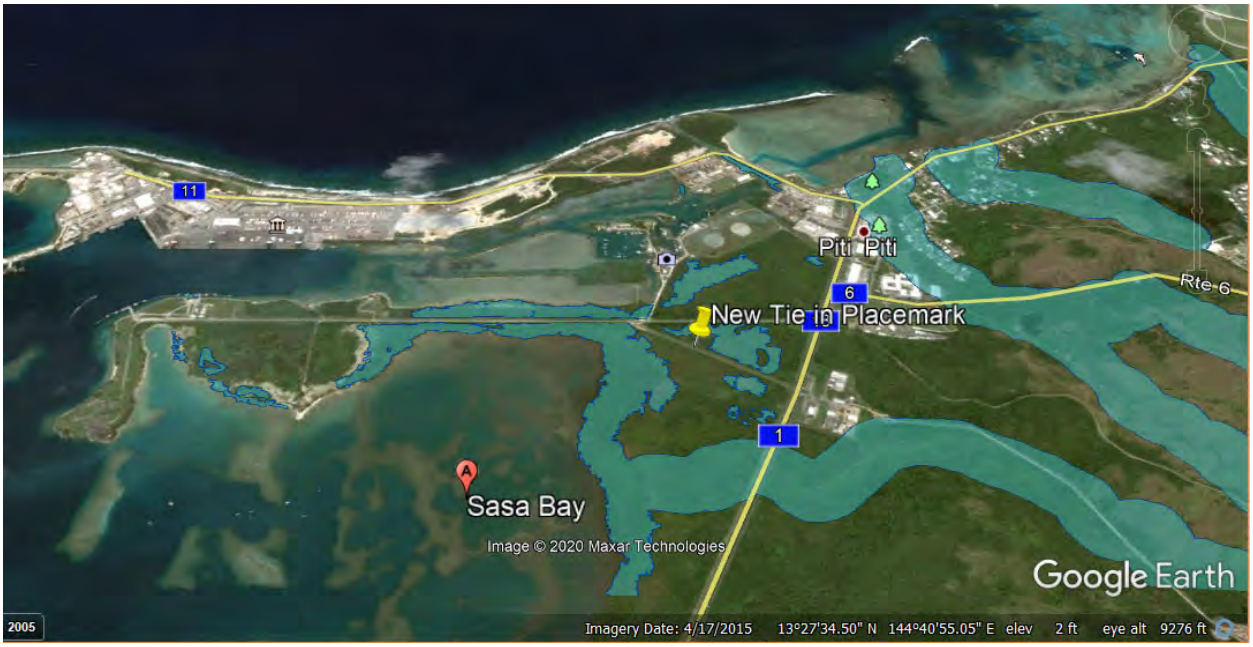

Figure 1. The blue area indicates Mariana common moorhen habitat


Figure 2. Project Vicinity Map and construction elements.

Avoidance and Minimization Measures
The following conservation measures will be implemented at the project site to avoid and minimize effects to the species.

General construction conservation measures:
1. The Service will be notified prior to project initiation and provided with the results of pre-construction waterbird surveys.
2. The contractor will have a biological monitor on site for the duration of construction to ensure protected wildlife will be avoided during the construction phase of the project.
3. The biological monitor will be provided a fact sheet with color photographs of threatened or endangered species in the action area, and a number to call if a sighting occurs. The biological monitor would keep track of contractors on site, potential Threatened and Endangered species sightings, and make weekly reports to NAVFAC Marianas.
4. If a severe weather event occurs that could potentially disperse wildlife to the area, surveys will be conducted prior to resuming construction.

Specific measures for the Mariana common moorhen:
5. A biological monitor will conduct surveys for moorhen adults, juveniles, and nests at the project site prior to project initiation. Repeat surveys again within 3 days of project initiation and after any subsequent delay of work of 3 or more days.
6. If a nest and/or brood is present, construction activities will cease and the US Fish and Wildlife Service (USFWS) will be contacted immediately. Activities may not begin without USFWS assessing the situation.
7. A 100-foot (30 meter) buffer will be established and maintained around all active nests and/or broods until the chicks/ducklings have fledged. No potentially disruptive activities or habitat alteration should occur within this buffer. A biological monitor(s) will be present on the project site during all construction or earth moving activities to ensure that individual moorhens and their nests are not adversely impacted.
8. If a moorhen is observed within the project site, or flies into the site while activities are occurring, the biological monitor shall halt all activities within 100 feet (30 meters) of the individual(s). Work should not resume until the listed waterbird(s) leave the area on their own accord.
9. Temporary fencing will be erected around construction sites to deter moorhens from entering. Silt fences will also be used around excavated and cleared sites for erosion control and to deter moorhens.
10. No pre-construction vegetation clearing, grubbing, groundwork, or commencement of construction activities that may impact the wetland areas during the peak Mariana moorhen nesting season (July to November)
11. A post-construction report will be submitted to the Service with 30 days of the completion of the project. The report will include the results of the moorhen surveys, the location and outcome of documented nests, and any other relevant information.

In the past five years there have been three different oil spills on Guam one that happened in August of 2017 at the Sasa Valley Fuel Farm of which had 8 different spill locations and was similar in project description to NBG Fuel Tie In MILCON P661. The Sasa Valley Fuel Farm spill was not reported for several months after the incident occurred.

Because of the recent history of oil spills on Guam the following assurances have been added to protect the habitat and wildlife from oil and contaminate spills:

-An absorbent barrier for oil/petroleum product will be used to contain the construction site from entering the wetland and shoreline long the berm.

- Methods to remove petroleum in the existing pipe will be provided to the Service. The current plan is to use a pigging that will push the remaining material within the pipe to the other end before plugging. At either end of the close off valve, containment barrier will be established and any material caught will be disposed at on upland disposal site.

-Draft plans of the spill plans, specifically the 404 permit and individual permit will be sent to the FWS contaminant specialist for review.

-The EA will be available for the Services review during the public review period. A notice of the review period will be provided to the Service before the EA is available.

Consequences of the Action
Mariana common moorhen: Because the species are adjacent to the work site, construction work will be halted or postponed in that area; construction workers will be instructed not to harm or harass the species; work will be halted if the bird is present within a 100 feet of the worksite; a barrier to oil spills and a fence be installed to deter birds from entering the work site; along with further cooperation with USFWS on specific spill mitigation and prevention methods will be done to minimize impacts, impacts to the bird are expected to be extremely unlikely to occur. Because adverse effects are extremely unlikely to occur; they are discountable and therefore not likely to adversely affect the Mariana common moorhen.

Conclusion
Based on the proposed action, our analysis indicates impacts of the proposed action, to the Mariana common moorhen are discountable as described above. The USFWS therefore concurs with your determination that the proposed project NBG Fuel Tie In MILCON P661 Guam, may affect, but is not likely to adversely affect the Mariana common moorhen, *Gallinula chloropus guami.*

Thank you for your time and working towards conserving threatened and endangered species. We look forward to coordinating with you on the Storm Water Pollution Prevention Plan (SWPPP) to facilitate ease of response and minimize impact to the species. The Pacific Islands Fish and Wildlife Office is available to assist in the evaluation of specific project documentation related to compliance with the ESA requirements. If you need further assistance, please contact Heather Benedict at heather_benedict@fws.gov.

Sincerely,

JACQUELINE FLORES

Digitally signed by JACQUELINE FLORES
Date: 2020.11.19 14:52:53 +10'00'

Jacqueline Flores
Mariana Islands Team Manager

Cc: Jay Gutierrez, Division of Aquatics and Wildlife Resources

Lourdes A. Leon Guerrero
Governor of Guam

Joshua F. Tenorio
Lieutenant Governor

BUREAU OF STATISTICS & PLANS
SAGAN PLANU SIHA YAN EMFOTMASION
Government of Guam
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Tyrone J. Taitano
Director
Matthew Santos
Deputy Director

NOV 08 2021

Edward E. Moon
Installation Environmental Program Director
Department of the Navy
U.S. Naval Base Guam
PSC 455 Box 152
FPO AP 96540-1000

RE: Coastal Zone Management Act (CZMA) Federal Consistency Review for Department of the Navy's proposed Navy/Commercial Petroleum, Oil, and Lubricant (POL) Tie-In Hardening (MILCON P-661) at Naval Base Guam (GCMP FC 2021-0045)

Hafa adai! The Guam Coastal Management Program of the Bureau of Statistics and Plans (Bureau) has completed its review of the Federal Consistency Determination by Department of the Navy received on September 9, 2021. The Department of the Navy ("the federal agency") has submitted its consistency determination relative to its proposed Navy/Commercial Petroleum, Oil, and Lubricant (POL) Tie-In Hardening (MILCON P-661) at Naval Base Guam.

The Bureau coordinated this review with partnering agencies, provided Public Notice, and received comments from the Guam Waterworks Authority. Furthermore, the Bureau hereby concurs with the federal agency's determination that the proposal is consistent with the enforceable policies of the Bureau's Guam Coastal Management Program (GCMP) based upon the following comments and conditions:

Development Policy 5. Hazardous Areas. *Identified hazardous lands, including floodplains, 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.*

The federal agency represents that the project site is within Zone "A" Special Flood Hazard Areas Subject to Inundation by the 1% Annual Chance Flood. This is under the National Flood Insurance Program. 18 GAR Chapter 3 Article 4 establishes standards for Flood Hazard Area Management for development within flood hazard areas. Under 18 GAR §3404, development includes "placement or erection of any solid material or structure" and a number of other activities, and flood hazard areas are defined as "Any land area subject to flood- conditions or susceptible to inundation, including wetlands, and areas subject to one percent (1%) or greater chance of flooding in any given year (100-year flood), as designated on the official map of Flood Hazard Areas."

Development in Flood Hazard areas are subject to a number of requirements under 18 GAR §3406, Standards for Flood Hazard Area Management. The most relevant requirements are listed below

as conditions, including compliance with water quality, erosion and sedimentation control standards established by the Guam Environmental Protection Agency (GEPA). As represented by the federal agency, it will seek Clean Water Act 401 Water Quality Certification and stormwater management permitting from GEPA, which will help to ensure that the proposed action will be conducted in compliance with such standards.

The federal agency represents that it will install silt fencing as an erosion control measure.

Pursuant to Development Policy 5, Hazardous Areas, the federal agency shall:

(a) comply with water quality, erosion, and sediment control standards promulgated by the Guam Environmental Protection Agency, in accordance with 18 GAR §3406(a).
(b) not grade, dredge, or fill in the Flood Hazard Area such that natural topographic drain ways are altered unless issued a Flood Hazard Area Permit by the Department of Public Works, in accordance with 18 GAR §3406(b).
(c) ensure that the design of the proposed development maintains the natural flow during flood conditions, to the maximum extent practicable, as provided in 18 GAR §3406(c).
(d) ensure that fill materials are not discarded into flood hazard areas such as to impede the natural flood flow or velocity by creating an accumulation of loose debris, as provided in 18 GAR §3406(h).
(e) not store toxic chemicals, fertilizers, pesticides, biological wastes or other contaminant substances which would be subject to dispersal into flood waters during periods of inundation within the flood hazard areas, as provided in 18 GAR §3406(j).
(f) avoid excessive removal of natural vegetation in the flood hazard area unless demonstrated to the satisfaction of GEPA that erosion control measures would satisfactorily prevent erosion and sedimentation, as provided in 18 GAR §3406(k).
(g) ensure that all approved flood control measures and structures will be periodically maintained and immediately repaired in cases of failure. Flood control measures shall not increase flood heights in upstream areas or cause erosion of lands not previously subject to a higher flood level or increased flood velocity. This shall ensure compliance with 18 GAR §3406(l).
(h) ensure that flood control measures or development does not reduce the water supply or biological productivity of a wetland habitat, as provided in 18 GAR §3406(m).
(i) ensure that all electrical equipment and the lowest flood or approved structures will be elevated above the maximum known flood elevation, as provided in 18 GAR §3406(s).
(j) implement appropriate Erosion and Sediment Control BMPs in accordance with the CNMI & Guam Stormwater Management Manual and the Guam Soil Erosion and Sediment Control Regulations, 22 GAR Chapter 10. As required in the regulations, permits must be secured prior to the start of the project.
(k) not use wetlands as a stockpiling site without first obtaining permits, as required by 22 GAR §10103(c)(8).
(l) inspect and ensure the proper maintenance of work vehicles and construction equipment to ensure that there are no leaks of oil or other hazardous liquids. A spill prevention kit must be readily available at the site. Proper housekeeping must be strictly implemented, to avoid contaminants being carried by stormwater runoff or spills to the ground surface, which would impact the water quality in the area.

(m) comply with the Guam Soil Erosion and Sediment Control Regulations, 22 GAR Chapter 10, the Water Pollution Control Act, 10 GCA Chapter 47, and the Guam Water Quality Standards, 22 GAR Chapter 5.

Resource Policy 3. Fragile Areas. *Development in the following types of fragile areas shall be regulated to protect their unique character.*

- *historical and archeological sites*
- *wildlife habitats*
- *pristine marine and terrestrial communities*

The Mariana common moorhen, *Gallinula chloropus guami*, is a federally and locally protected species under the Endangered Species Act. The moorhen is known to occur in wetlands that occur adjacent to part of the project site. The federal agency represents that it is likely that the species nests in the wetland to the north of the POL causeway. The federal agency states that it will install temporary fencing to ensure that waterbirds present in the wetland will not enter construction areas.

The federal agency states that a biological monitor will conduct surveys for moorhen adults, juveniles, and nests at the project site prior to the start of the project and will repeat the surveys within 3 days of its start and after any delay of work of 3 days or more.

The federal agency represents that its silt fencing will be weighted or buried so that moorhens cannot get under the fence. The agency further represents that it will not undertake pre-construction vegetation clearing, grubbing, or groundwork, or commence construction activities that may impact the wetland areas during the moorhen's nesting season of July to November.

A post-construction report will be submitted to the Fish and Wildlife Service within 30 days of the completion of the project, which will include the results of the moorhen surveys, the location and outcome of documented nests, and any other relevant information.

Pursuant to Resource Policy 3, Fragile Areas, the federal agency shall:

(a) be advised to provide the Department of Agriculture Division of Aquatic and Wildlife Resources (DoAg-DAWR) the results from the preconstruction waterbird surveys.
(b) cease construction activities if the Mariana common moorhen occurs on the project site until it leaves the area of its own volition.
(c) be advised to provide DoAg-DAWR with a copy of the post-construction report provided to the Fish and Wildlife Service.

Therefore, based on the conditional concurrence stated above and the Bureau's review of all other information submitted, we find the application to be consistent with the approved development and resource policies of the Guam Coastal Management Program (GCMP), in accordance with the Coastal Zone Management Act of 1972, (P.L. 92-583) as amended, (P.L. 94-370). The Federal Consistency concurrence, however, does not preclude the need for securing other federal and Government of Guam permits, clearances and approvals prior to the start of this project.

Per 15 CFR §930.4(b), if the requirements for conditional concurrences specified in 15 CFR §930.4(a), (1) through (3), are not met, then all parties shall treat this conditional concurrence letter

as an objection pursuant to 15 CFR Part 930 subpart D. Furthermore, if an objection is determined, you are hereby notified that, pursuant to 15 CFR §930.63(e) and 15 CFR Part 930, subpart H, you have the opportunity to appeal an objection resulting from not meeting the requirements of 15 CFR §930.4(a), (1) through (3), to the Secretary of Commerce within 30 days after receiving this conditional concurrence letter, or 30 days after receiving notice from the Federal agency that your application will not be approved as amended by the conditions required by this concurrence.

The proposed action shall be operated and completed as represented in the Coastal Zone Management (CZM) federal consistency determination. Significant changes to the subject proposal shall be submitted to the Bureau for review and approval and may require a full CZM federal consistency review, including publication of a public notice and provision for public review and comment. This condition is necessary to ensure that the proposed actions are implemented as reviewed for consistency with the enforceable policies of GCMP. Guam Land Use policies (E.O. 78-37), are the federally approved enforceable policies of GCMP that applies to this condition.

Please do not hesitate to contact Mr. Julian Janssen, Federal Activities Planner at 475-9664 or email julian.janssen@bsp.guam.gov or Mr. Edwin Reyes, Coastal Program Administrator at 475-9672 or email edwin.reyes@bsp.guam.gov. *Si Yu'os Ma'åse'.*

Sincerely,

TYRONE J. TAITANO
Director

Cc: NOAA-OCM
DoAgr-DAWR
DLM
DPR-SHPO
DPW
GEPA
GWA

Appendix C
Air Quality - Emission Calculations

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Appendix A
Air Quality - Emission Calculations

Emissions Summary										
	Emissions (tpy)									
Year	CO	NOx	PM10	PM2.5	SO2	VOC	CO2	CH4	N2O	CO2e
2022	0.60	0.67	0.03	0.03	0.001	0.07	160.12	0.004	0.0003	160.31
2023	0.92	1.18	0.05	0.05	0.002	0.11	305.16	0.006	0.0003	305.40
2024	0.39	0.55	0.02	0.02	0.001	106.45	146.61	0.003	0.0003	146.76

Appendix A
Air Quality - Emission Calculations

Equipment	Category	CO Emission Factor				CO Emissions (lb/yr)		
		2022	2023	2024	units	2022	2023	2024
GOVERNMENT OVERSIGHT								
Passenger Truck	Passenger Truck - idle[1]	8.05	6.61	6.61	g/hr	17.29	15.82	15.82
	Passenger Truck - 25 mph[1]	3.95	3.63	3.63	g/mi			
	Passenger Truck - start[1]	16.44	14.97	14.97	g/start			
CONSTRUCTION								
Passenger Vehicle (Light Pickup)	Passenger Truck - idle[1]	8.05	6.61	6.61	g/hr	68.87	62.87	62.87
	Passenger Truck - 25 mph[1]	3.95	3.63	3.63	g/mi			
	Passenger Truck - start[1]	16.44	14.97	14.97	g/start			
Passenger Vehicle (SUV)	Passenger Truck - idle[1]	8.05	6.61	6.61	g/hr	68.87	62.87	62.87
	Passenger Truck - 25 mph[1]	3.95	3.63	3.63	g/mi			
	Passenger Truck - start[1]	16.44	14.97	14.97	g/start			
Passenger Truck	Passenger Truck - idle[1]	8.05	6.61	6.61	g/hr	68.87	62.87	62.87
	Passenger Truck - 25 mph[1]	3.95	3.63	3.63	g/mi			
	Passenger Truck - start[1]	16.44	14.97	14.97	g/start			
Full-sized Pickup Truck	Passenger Truck - idle[1]	8.05	6.61	6.61	g/hr	68.87	62.87	62.87
	Passenger Truck - 25 mph[1]	3.95	3.63	3.63	g/mi			
	Passenger Truck - start[1]	16.44	14.97	14.97	g/start			
Flatbed Truck (semi-trailer)	Single Unit Short-Haul Truck - idle[1]	12.75	11.71	11.71	g/hr	9.74	9.24	9.24
	Single Unit Short-Haul Truck - 25 mph[1]	1.69	1.53	1.53	g/mi			
	Single Unit Short-Haul Truck - start[1]	7.69	7.64	7.64	g/start			
Excavator	Excavators (100 < hp <= 175)[2]	11.59	8.84	8.84	g/hr	0.77	1.52	0.35
Crawler Crane (pile driver)	Excavators (750 < hp <= 1000)[2]	182.19	160.51	160.51	g/hr	32.13	31.85	14.86
Light Crane (piping)	Cranes (75 < hp <= 100)[2]	19.45	16.16	-	g/hr	0.86	2.14	-
Air Compressor	Air Compressors (100 < hp <= 175)[2]	12.12	10.80	10.80	g/hr	2.67	4.76	2.38
Backhoe	Tractors/Loaders/Backhoes (75 < hp <= 100)[2]	48.00	38.46	38.46	g/hr	6.35	6.78	5.09
Concrete Pump	Pumps (300 < hp <= 600)[2]	126.68	113.41	113.41	g/hr	5.03	7.50	3.00
Dewatering Pump	Pumps (50 < hp <= 75)[2]	1211.92	1057.27	-	g/hr	213.75	372.94	-
Dozer	Crawler Tractor/Dozers (175 < hp <= 300)[2]	18.15	13.12	-	g/hr	1.20	1.16	-
Extension Forklift	Forklifts (100 < hp <= 175)[2]	5.49	4.71	4.71	g/hr	0.36	0.69	0.21
Generator	Generator Sets (300 < hp <= 600)[2]	131.91	118.09	118.09	g/hr	267.55	520.70	239.52
Handheld Plate Compactor	Plate Compactors (6 < hp <= 11)[2]	1248.15	1247.80	-	g/hr	198.12	275.09	-
Grader	Graders (175 < hp <= 300)[2]	17.04	12.23	12.23	g/hr	1.50	1.08	1.08
Vacuum Truck (purge lines)	Other Construction Equipment (175 < hp <= 300)[2]	34.68	30.32	-	g/hr	2.29	4.41	-
Roller Compactor - drum	Rollers (100 < hp <= 175)[2]	-	16.94	16.94	g/hr	-	3.36	2.02
Truck-Mounted Striper	Other General Industrial Eqp (50 < hp <= 75)[2]	-	-	554.04	g/hr	-	-	73.29
Welder	Welders (50 < hp <= 75)[2]	595.46	560.74	560.74	g/hr	65.64	128.57	61.81
Welder	Welders (75 < hp <= 100)[2]	748.66	705.00	705.00	g/hr	82.53	161.64	77.71
Asphalt Paver	Pavers (175 < hp <= 300)[2]	-	-	17.55	g/hr	-	-	2.09
Concrete Mixer	Cement & Mortar Mixers (300 < hp <= 600)[2]	130.52	119.10	119.10	g/hr	8.63	15.75	6.30
End Dump Truck	Single Unit Short-Haul Truck - idle[1]	12.75	11.71	11.71	g/hr	4.07	4.42	4.01
	Single Unit Short-Haul Truck - 25 mph[1]	1.69	1.53	1.53	g/mi			
	Single Unit Short-Haul Truck - start[1]	7.69	7.64	7.64	g/start			
Loader	Tractors/Loaders/Backhoes (175 < hp <= 300)[2]	41.38	33.38	33.38	g/hr	10.95	10.30	9.13
				TOTAL (lb/yr)		1206.92	1831.23	779.40
				TOTAL (tpy)		0.60	0.92	0.39

NOTES:

[1] Onroad - U.S. EPA MOtor Vehicle Emission Simulator (MOVES) 2014b; January, Hour 08:00-08:59, Weekdays; Virgin Islands St. Thomas; Rural Unrestricted Access, Off-Network; Non-Extended Idle Processes; Soak Time ≥ 720 minutes; assume all idle when only operating hours available (no VMT data);
Idle Emissions (lb/yr) = [Emission Factor (g/hr) x activity (hr/yr)]/(453.59 g/lb);
Running (25 mph) Emissions (lb/yr) = Emission Factor (g/mi) x activity (mi/yr)]/(453.59 g/lb);
Start Emissions (lb/yr) = Emission Factor (g/start) x 2 starts/trips x activity (trips/yr)]/(453.59 g/lb); activity (trips/yr) = No. of Trips x annual VMT/project total VMT;
2024 emission factors = 2023 emission factors.

[2] Nonroad - U.S. EPA MOtor Vehicle Emission Simulator (MOVES) 2014b; Weekdays, All Months; Virgin Islands St. Thomas except Honolulu Hawaii for Other General Industrial Eqp; All Processes; Maximum Monthly;
Emissions (lb/yr) = [Emission Factor (g/hr) x activity (hr/yr)]/(453.59 g/lb); 2024 emission factors = 2023 emission factors.

Appendix A
Air Quality - Emission Calculations

Equipment	Category	NOx Emission Factor				NOx Emissions (lb/yr)		
		2022	2023	2024	units	2022	2023	2024
GOVERNMENT OVERSIGHT								
Passenger Truck	Passenger Truck - idle[1]	0.81	0.66	0.66	g/hr	0.96	0.83	0.83
	Passenger Truck - 25 mph[1]	0.24	0.20	0.20	g/mi			
	Passenger Truck - start[1]	0.86	0.76	0.76	g/start			
CONSTRUCTION								
Passenger Vehicle (Light Pickup)	Passenger Truck - idle[1]	0.81	0.66	0.66	g/hr	3.74	3.24	3.24
	Passenger Truck - 25 mph[1]	0.24	0.20	0.20	g/mi			
	Passenger Truck - start[1]	0.86	0.76	0.76	g/start			
Passenger Vehicle (SUV)	Passenger Truck - idle[1]	0.81	0.66	0.66	g/hr	3.74	3.24	3.24
	Passenger Truck - 25 mph[1]	0.24	0.20	0.20	g/mi			
	Passenger Truck - start[1]	0.86	0.76	0.76	g/start			
Passenger Truck	Passenger Truck - idle[1]	0.81	0.66	0.66	g/hr	3.74	3.24	3.24
	Passenger Truck - 25 mph[1]	0.24	0.20	0.20	g/mi			
	Passenger Truck - start[1]	0.86	0.76	0.76	g/start			
Full-sized Pickup Truck	Passenger Truck - idle[1]	0.81	0.66	0.66	g/hr	3.74	3.24	3.24
	Passenger Truck - 25 mph[1]	0.24	0.20	0.20	g/mi			
	Passenger Truck - start[1]	0.86	0.76	0.76	g/start			
Flatbed Truck (semi-trailer)	Single Unit Short-Haul Truck - idle[1]	27.93	24.95	24.95	g/hr	11.42	10.31	10.31
	Single Unit Short-Haul Truck - 25 mph[1]	3.65	3.27	3.27	g/mi			
	Single Unit Short-Haul Truck - start[1]	0.92	0.93	0.93	g/start			
Excavator	Excavators (100 < hp <= 175)[2]	35.57	28.23	28.23	g/hr	2.35	4.86	1.12
Crawler Crane (pile driver)	Excavators (750 < hp <= 1000)[2]	1371.71	1331.43	1331.43	g/hr	241.93	264.18	123.28
Light Crane (piping)	Cranes (75 < hp <= 100)[2]	60.85	55.60	-	g/hr	2.68	7.35	-
Air Compressor	Air Compressors (100 < hp <= 175)[2]	58.31	51.51	51.51	g/hr	12.86	22.71	11.36
Backhoe	Tractors/Loaders/Backhoes (75 < hp <= 100)[2]	52.41	44.75	44.75	g/hr	6.93	7.89	5.92
Concrete Pump	Pumps (300 < hp <= 600)[2]	431.10	391.24	391.24	g/hr	17.11	25.88	10.35
Dewatering Pump	Pumps (50 < hp <= 75)[2]	113.92	98.25	-	g/hr	20.09	34.66	-
Dozer	Crawler Tractor/Dozers (175 < hp <= 300)[2]	54.24	42.09	-	g/hr	3.59	3.71	-
Extension Forklift	Forklifts (100 < hp <= 175)[2]	17.15	14.99	14.99	g/hr	1.13	2.18	0.66
Generator	Generator Sets (300 < hp <= 600)[2]	453.93	411.96	411.96	g/hr	920.68	1816.43	835.56
Handheld Plate Compactor	Plate Compactors (6 < hp <= 11)[2]	7.78	7.77	-	g/hr	1.23	1.71	-
Grader	Graders (175 < hp <= 300)[2]	51.07	39.54	39.54	g/hr	4.50	3.49	3.49
Vacuum Truck (purge lines)	Other Construction Equipment (175 < hp <= 300)[2]	112.75	98.70	-	g/hr	7.46	14.36	-
Roller Compactor - drum	Rollers (100 < hp <= 175)[2]	-	63.12	63.12	g/hr	-	12.52	7.51
Truck-Mounted Striper	Other General Industrial Eqp (50 < hp <= 75)[2]	-	-	54.02	g/hr	-	-	7.15
Welder	Welders (50 < hp <= 75)[2]	49.98	47.79	47.79	g/hr	5.51	10.96	5.27
Welder	Welders (75 < hp <= 100)[2]	62.84	60.09	60.09	g/hr	6.93	13.78	6.62
Asphalt Paver	Pavers (175 < hp <= 300)[2]	-	-	52.62	g/hr	-	-	6.26
Concrete Mixer	Cement & Mortar Mixers (300 < hp <= 600)[2]	509.85	468.29	468.29	g/hr	33.72	61.94	24.78
End Dump Truck	Single Unit Short-Haul Truck - idle[1]	27.93	24.95	24.95	g/hr	1.43	2.20	1.32
	Single Unit Short-Haul Truck - 25 mph[1]	3.65	3.27	3.27	g/mi			
	Single Unit Short-Haul Truck - start[1]	0.92	0.93	0.93	g/start			
Loader	Tractors/Loaders/Backhoes (175 < hp <= 300)[2]	87.36	70.50	70.50	g/hr	23.11	21.76	19.27
				TOTAL (lb/yr)		1340.61	2356.70	1094.05
				TOTAL (tpy)		0.67	1.18	0.55

NOTES:

[1] Onroad - U.S. EPA MOtor Vehicle Emission Simulator (MOVES) 2014b; January, Hour 08:00-08:59, Weekdays; Virgin Islands St. Thomas; Rural Unrestricted Access, Off-Network; Non-Extended Idle Processes; Soak Time ≥ 720 minutes; assume all idle when only operating hours available (no VMT data);
Idle Emissions (lb/yr) = [Emission Factor (g/hr) x activity (hr/yr)]/(453.59 g/lb);
Running (25 mph) Emissions (lb/yr) = Emission Factor (g/mi) x activity (mi/yr)]/(453.59 g/lb);
Start Emissions (lb/yr) = Emission Factor (g/start) x 2 starts/trips x activity (trips/yr)]/(453.59 g/lb); activity (trips/yr) = No. of Trips x annual VMT/project total VMT;
2024 emission factors = 2023 emission factors.

[2] Nonroad - U.S. EPA MOtor Vehicle Emission Simulator (MOVES) 2014b; Weekdays, All Months; Virgin Islands St. Thomas except Honolulu Hawaii for Other General Industrial Eqp; All Processes; Maximum Monthly;
Emissions (lb/yr) = [Emission Factor (g/hr) x activity (hr/yr)]/(453.59 g/lb); 2024 emission factors = 2023 emission factors.

Appendix A
Air Quality - Emission Calculations

Equipment	Category	PM10 Emission Factor				PM10 Emissions (lb/yr)		
		2022	2023	2024	units	2022	2023	2024
GOVERNMENT OVERSIGHT								
Passenger Truck	Passenger Truck - idle[1]	0.02	0.02	0.02	g/hr	0.15	0.15	0.15
	Passenger Truck - 25 mph[1]	0.08	0.08	0.08	g/mi			
	Passenger Truck - start[1]	0.01	0.01	0.01	g/start			
CONSTRUCTION								
Passenger Vehicle (Light Pickup)	Passenger Truck - idle[1]	0.02	0.02	0.02	g/hr	0.35	0.35	0.35
	Passenger Truck - 25 mph[1]	0.08	0.08	0.08	g/mi			
	Passenger Truck - start[1]	0.01	0.01	0.01	g/start			
Passenger Vehicle (SUV)	Passenger Truck - idle[1]	0.02	0.02	0.02	g/hr	0.35	0.35	0.35
	Passenger Truck - 25 mph[1]	0.08	0.08	0.08	g/mi			
	Passenger Truck - start[1]	0.01	0.01	0.01	g/start			
Passenger Truck	Passenger Truck - idle[1]	0.02	0.02	0.02	g/hr	0.35	0.35	0.35
	Passenger Truck - 25 mph[1]	0.08	0.08	0.08	g/mi			
	Passenger Truck - start[1]	0.01	0.01	0.01	g/start			
Full-sized Pickup Truck	Passenger Truck - idle[1]	0.02	0.02	0.02	g/hr	0.35	0.35	0.35
	Passenger Truck - 25 mph[1]	0.08	0.08	0.08	g/mi			
	Passenger Truck - start[1]	0.01	0.01	0.01	g/start			
Flatbed Truck (semi-trailer)	Single Unit Short-Haul Truck - idle[1]	3.04	2.72	2.72	g/hr	1.44	1.34	1.34
	Single Unit Short-Haul Truck - 25 mph[1]	0.48	0.45	0.45	g/mi			
	Single Unit Short-Haul Truck - start[1]	0.05	0.04	0.04	g/start			
Excavator	Excavators (100 < hp <= 175)[2]	2.96	2.22	2.22	g/hr	0.20	0.38	0.09
Crawler Crane (pile driver)	Excavators (750 < hp <= 1000)[2]	31.19	28.34	28.34	g/hr	5.50	5.62	2.62
Light Crane (piping)	Cranes (75 < hp <= 100)[2]	3.54	2.96	-	g/hr	0.16	0.39	-
Air Compressor	Air Compressors (100 < hp <= 175)[2]	2.97	2.66	2.66	g/hr	0.66	1.17	0.59
Backhoe	Tractors/Loaders/Backhoes (75 < hp <= 100)[2]	8.00	6.30	6.30	g/hr	1.06	1.11	0.83
Concrete Pump	Pumps (300 < hp <= 600)[2]	19.78	17.68	17.68	g/hr	0.79	1.17	0.47
Dewatering Pump	Pumps (50 < hp <= 75)[2]	2.83	2.82	-	g/hr	0.50	1.00	-
Dozer	Crawler Tractor/Dozers (175 < hp <= 300)[2]	3.80	2.85	-	g/hr	0.25	0.25	-
Extension Forklift	Forklifts (100 < hp <= 175)[2]	1.33	1.12	1.12	g/hr	0.09	0.16	0.05
Generator	Generator Sets (300 < hp <= 600)[2]	19.96	17.83	17.83	g/hr	40.48	78.63	36.17
Handheld Plate Compactor	Plate Compactors (6 < hp <= 11)[2]	0.52	0.52	-	g/hr	0.08	0.11	-
Grader	Graders (175 < hp <= 300)[2]	3.59	2.69	2.69	g/hr	0.32	0.24	0.24
Vacuum Truck (purge lines)	Other Construction Equipment (175 < hp <= 300)[2]	6.93	6.07	-	g/hr	0.46	0.88	-
Roller Compactor - drum	Rollers (100 < hp <= 175)[2]	-	4.26	4.26	g/hr	-	0.84	0.51
Truck-Mounted Striper	Other General Industrial Eqp (50 < hp <= 75)[2]	-	-	3.42	g/hr	-	-	0.45
Welder	Welders (50 < hp <= 75)[2]	2.98	2.98	2.98	g/hr	0.33	0.68	0.33
Welder	Welders (75 < hp <= 100)[2]	3.74	3.75	3.75	g/hr	0.41	0.86	0.41
Asphalt Paver	Pavers (175 < hp <= 300)[2]	-	-	3.65	g/hr	-	-	0.43
Concrete Mixer	Cement & Mortar Mixers (300 < hp <= 600)[2]	17.87	16.37	16.37	g/hr	1.18	2.17	0.87
End Dump Truck	Single Unit Short-Haul Truck - idle[1]	3.04	2.72	2.72	g/hr	0.13	0.21	0.12
	Single Unit Short-Haul Truck - 25 mph[1]	0.48	0.45	0.45	g/mi			
	Single Unit Short-Haul Truck - start[1]	0.05	0.04	0.04	g/start			
Loader	Tractors/Loaders/Backhoes (175 < hp <= 300)[2]	8.01	6.51	6.51	g/hr	2.12	2.01	1.78
CONSTRUCTION - FUGITIVE DUST								
Excavator	Bulldozing[3]	2.47	2.47	2.47	lb/hr	0.16	0.42	0.10
Backhoe	Bulldozing[3]	2.47	2.47	2.47	lb/hr	0.33	0.44	0.33
Dozer	Bulldozing[3]	2.47	2.47	-	lb/hr	0.16	0.22	-
Handheld Plate Compactor	Bulldozing[3]	2.47	2.47	-	lb/hr	0.39	0.54	-
Grader	Grading[3]	0.57	0.57	0.57	lb/mi	0.001	0.001	0.001
Roller Compactor - drum	Bulldozing[3]	-	2.47	2.47	lb/hr	-	0.49	0.29
Concrete Mixer	Material Handling[3]	0.0003	0.0003	0.0003	lb/ton	0.0001	0.0003	0.0001
End Dump Truck	Material Handling[3]	0.0003	0.0003	0.0003	lb/ton	0.004	0.008	0.004
Loader	Material Handling[3]	0.0003	0.0003	0.0003	lb/ton	0.002	0.002	0.002
				TOTAL (lb/yr)		58.74	102.90	49.55
				TOTAL (tpy)		0.03	0.05	0.02

NOTES:

[1] Onroad - U.S. EPA MOtor Vehicle Emission Simulator (MOVES) 2014b; January, Hour 08:00-08:59, Weekdays; Virgin Islands St. Thomas; Rural Unrestricted Access, Off-Network; Non-Extended Idle Processes; Soak Time ≥ 720 minutes; assume all idle when only operating hours available (no VMT data);
Idle Emissions (lb/yr) = [Emission Factor (g/hr) x activity (hr/yr)]/(453.59 g/lb);
Running (25 mph) Emissions (lb/yr) = Emission Factor (g/mi) x activity (mi/yr)]/(453.59 g/lb);
Start Emissions (lb/yr) = Emission Factor (g/start) x 2 starts/trips x activity (trips/yr)]/(453.59 g/lb); activity (trips/yr) = No. of Trips x annual VMT/project total VMT;
2024 emission factors = 2023 emission factors.

[2] Nonroad - U.S. EPA MOtor Vehicle Emission Simulator (MOVES) 2014b; Weekdays, All Months; Virgin Islands St. Thomas except Honolulu Hawaii for Other General Industrial Eqp; All Processes; Maximum Monthly;
Emissions (lb/yr) = [Emission Factor (g/hr) x activity (hr/yr)]/(453.59 g/lb); 2024 emission factors = 2023 emission factors.

[3] U.S. EPA AP-42 Chapter 13.2.3 Heavy Construction Operations: Bulldozing (Table 11.9-1), material silt content (s) = 23%, moisture content (M) = 10%; Grading (Table 11.9-1), mean vehicle speed (S) = 5 mph; Material Handling (13.2.4, equation 1), k(PM10) = 0.35, k(PM2.5)=0.053, moisture content (M) = 10%, mean wind speed (U) =

Appendix A
Air Quality - Emission Calculations

Equipment	Category	PM2.5 Emission Factor				PM2.5 Emissions (lb/yr)		
		2022	2023	2024	units	2022	2023	2024
GOVERNMENT OVERSIGHT								
Passenger Truck	Passenger Truck - idle[1]	0.02	0.02	0.02	g/hr	0.03	0.03	0.03
	Passenger Truck - 25 mph[1]	0.01	0.01	0.01	g/mi			
	Passenger Truck - start[1]	0.01	0.01	0.01	g/start			
CONSTRUCTION								
Passenger Vehicle (Light Pickup)	Passenger Truck - idle[1]	0.02	0.02	0.02	g/hr	0.10	0.09	0.09
	Passenger Truck - 25 mph[1]	0.01	0.01	0.01	g/mi			
	Passenger Truck - start[1]	0.01	0.01	0.01	g/start			
Passenger Vehicle (SUV)	Passenger Truck - idle[1]	0.02	0.02	0.02	g/hr	0.10	0.09	0.09
	Passenger Truck - 25 mph[1]	0.01	0.01	0.01	g/mi			
	Passenger Truck - start[1]	0.01	0.01	0.01	g/start			
Passenger Truck	Passenger Truck - idle[1]	0.02	0.02	0.02	g/hr	0.10	0.09	0.09
	Passenger Truck - 25 mph[1]	0.01	0.01	0.01	g/mi			
	Passenger Truck - start[1]	0.01	0.01	0.01	g/start			
Full-sized Pickup Truck	Passenger Truck - idle[1]	0.02	0.02	0.02	g/hr	0.10	0.09	0.09
	Passenger Truck - 25 mph[1]	0.01	0.01	0.01	g/mi			
	Passenger Truck - start[1]	0.01	0.01	0.01	g/start			
Flatbed Truck (semi-trailer)	Single Unit Short-Haul Truck - idle[1]	2.80	2.50	2.50	g/hr	0.85	0.76	0.76
	Single Unit Short-Haul Truck - 25 mph[1]	0.27	0.24	0.24	g/mi			
	Single Unit Short-Haul Truck - start[1]	0.04	0.04	0.04	g/start			
Excavator	Excavators (100 < hp <= 175)[2]	2.87	2.16	2.16	g/hr	0.19	0.37	0.09
Crawler Crane (pile driver)	Excavators (750 < hp <= 1000)[2]	30.26	27.49	27.49	g/hr	5.34	5.45	2.55
Light Crane (piping)	Cranes (75 < hp <= 100)[2]	3.43	2.87	-	g/hr	0.15	0.38	-
Air Compressor	Air Compressors (100 < hp <= 175)[2]	2.88	2.58	2.58	g/hr	0.64	1.14	0.57
Backhoe	Tractors/Loaders/Backhoes (75 < hp <= 100)[2]	7.76	6.11	6.11	g/hr	1.03	1.08	0.81
Concrete Pump	Pumps (300 < hp <= 600)[2]	19.19	17.15	17.15	g/hr	0.76	1.13	0.45
Dewatering Pump	Pumps (50 < hp <= 75)[2]	2.60	2.60	-	g/hr	0.46	0.92	-
Dozer	Crawler Tractor/Dozers (175 < hp <= 300)[2]	3.68	2.77	-	g/hr	0.24	0.24	-
Extension Forklift	Forklifts (100 < hp <= 175)[2]	1.29	1.08	1.08	g/hr	0.09	0.16	0.05
Generator	Generator Sets (300 < hp <= 600)[2]	19.36	17.30	17.30	g/hr	39.26	76.27	35.09
Handheld Plate Compactor	Plate Compactors (6 < hp <= 11)[2]	0.48	0.47	-	g/hr	0.08	0.10	-
Grader	Graders (175 < hp <= 300)[2]	3.48	2.60	2.60	g/hr	0.31	0.23	0.23
Vacuum Truck (purge lines)	Other Construction Equipment (175 < hp <= 300)[2]	6.72	5.89	-	g/hr	0.44	0.86	-
Roller Compactor - drum	Rollers (100 < hp <= 175)[2]	-	4.13	4.13	g/hr	-	0.82	0.49
Truck-Mounted Striper	Other General Industrial Eqp (50 < hp <= 75)[2]	-	-	3.15	g/hr	-	-	0.42
Welder	Welders (50 < hp <= 75)[2]	2.74	2.74	2.74	g/hr	0.30	0.63	0.30
Welder	Welders (75 < hp <= 100)[2]	3.44	3.45	3.45	g/hr	0.38	0.79	0.38
Asphalt Paver	Pavers (175 < hp <= 300)[2]	-	-	3.54	g/hr	-	-	0.42
Concrete Mixer	Cement & Mortar Mixers (300 < hp <= 600)[2]	17.34	15.88	15.88	g/hr	1.15	2.10	0.84
End Dump Truck	Single Unit Short-Haul Truck - idle[1]	2.80	2.50	2.50	g/hr	0.12	0.20	0.11
	Single Unit Short-Haul Truck - 25 mph[1]	0.27	0.24	0.24	g/mi			
	Single Unit Short-Haul Truck - start[1]	0.04	0.04	0.04	g/start			
Loader	Tractors/Loaders/Backhoes (175 < hp <= 300)[2]	7.77	6.31	6.31	g/hr	2.06	1.95	1.73
CONSTRUCTION - FUGITIVE DUST								
Excavator	Bulldozing[3]	0.97	0.97	0.97	lb/hr	0.06	0.17	0.04
Backhoe	Bulldozing[3]	0.97	0.97	0.97	lb/hr	0.13	0.17	0.13
Dozer	Bulldozing[3]	0.97	0.97	-	lb/hr	0.06	0.09	-
Handheld Plate Compactor	Bulldozing[3]	0.97	0.97	-	lb/hr	0.15	0.21	-
Grader	Grading[3]	0.05	0.05	0.05	lb/mi	0.0001	0.0001	0.0001
Roller Compactor - drum	Bulldozing[3]	-	0.97	0.97	lb/hr	-	0.19	0.12
Concrete Mixer	Material Handling[3]	0.00004	0.00004	0.00004	lb/ton	0.00002	0.00004	0.00002
End Dump Truck	Material Handling[3]	0.00004	0.00004	0.00004	lb/ton	0.0006	0.0012	0.0006
Loader	Material Handling[3]	0.00004	0.00004	0.00004	lb/ton	0.0002	0.0003	0.0002
				TOTAL (lb/yr)		54.65	96.81	45.95
				TOTAL (tpy)		0.03	0.05	0.02

NOTES:

[1] Onroad - U.S. EPA MOtor Vehicle Emission Simulator (MOVES) 2014b; January, Hour 08:00-08:59, Weekdays; Virgin Islands St. Thomas; Rural Unrestricted Access, Off-Network; Non-Extended Idle Processes; Soak Time ≥ 720 minutes; assume all idle when only operating hours available (no VMT data);
Idle Emissions (lb/yr) = [Emission Factor (g/hr) x activity (hr/yr)]/(453.59 g/lb);
Running (25 mph) Emissions (lb/yr) = Emission Factor (g/mi) x activity (mi/yr)]/(453.59 g/lb);
Start Emissions (lb/yr) = Emission Factor (g/start) x 2 starts/trips x activity (trips/yr)]/(453.59 g/lb); activity (trips/yr) = No. of Trips x annual VMT/project total VMT;
2024 emission factors = 2023 emission factors.

[2] Nonroad - U.S. EPA MOtor Vehicle Emission Simulator (MOVES) 2014b; Weekdays, All Months; Virgin Islands St. Thomas except Honolulu Hawaii for Other General Industrial Eqp; All Processes; Maximum Monthly;
Emissions (lb/yr) = [Emission Factor (g/hr) x activity (hr/yr)]/(453.59 g/lb); 2024 emission factors = 2023 emission factors.

[3] U.S. EPA AP-42 Chapter 13.2.3 Heavy Construction Operations: Bulldozing (Table 11.9-1), material silt content (s) = 23%, moisture content (M) = 10%; Grading (Table 11.9-1), mean vehicle speed (S) = 5 mph; Material Handling (13.2.4, equation 1), k(PM10) = 0.35, k(PM2.5)=0.053, moisture content (M) = 10%, mean wind speed (U) =

Appendix A
Air Quality - Emission Calculations

Equipment	Category	SO2 Emission Factor				SO2 Emissions (lb/yr)		
		2022	2023	2024	units	2022	2023	2024
GOVERNMENT OVERSIGHT								
Passenger Truck	Passenger Truck - idle[1]	0.02	0.02	0.02	g/hr	0.01	0.01	0.01
	Passenger Truck - 25 mph[1]	0.003	0.003	0.003	g/mi			
	Passenger Truck - start[1]	0.002	0.001	0.001	g/start			
CONSTRUCTION								
Passenger Vehicle (Light Pickup)	Passenger Truck - idle[1]	0.02	0.02	0.02	g/hr	0.02	0.02	0.02
	Passenger Truck - 25 mph[1]	0.003	0.003	0.003	g/mi			
	Passenger Truck - start[1]	0.002	0.001	0.001	g/start			
Passenger Vehicle (SUV)	Passenger Truck - idle[1]	0.02	0.02	0.02	g/hr	0.02	0.02	0.02
	Passenger Truck - 25 mph[1]	0.003	0.003	0.003	g/mi			
	Passenger Truck - start[1]	0.002	0.001	0.001	g/start			
Passenger Truck	Passenger Truck - idle[1]	0.02	0.02	0.02	g/hr	0.02	0.02	0.02
	Passenger Truck - 25 mph[1]	0.003	0.003	0.003	g/mi			
	Passenger Truck - start[1]	0.002	0.001	0.001	g/start			
Full-sized Pickup Truck	Passenger Truck - idle[1]	0.02	0.02	0.02	g/hr	0.02	0.02	0.02
	Passenger Truck - 25 mph[1]	0.003	0.003	0.003	g/mi			
	Passenger Truck - start[1]	0.002	0.001	0.001	g/start			
Flatbed Truck (semi-trailer)	Single Unit Short-Haul Truck - idle[1]	0.07	0.07	0.07	g/hr	0.03	0.03	0.03
	Single Unit Short-Haul Truck - 25 mph[1]	0.01	0.01	0.01	g/mi			
	Single Unit Short-Haul Truck - start[1]	0.002	0.002	0.002	g/start			
Excavator	Excavators (100 < hp <= 175)[2]	0.29	0.29	0.29	g/hr	0.02	0.05	0.01
Crawler Crane (pile driver)	Excavators (750 < hp <= 1000)[2]	1.99	1.97	1.97	g/hr	0.35	0.39	0.18
Light Crane (piping)	Cranes (75 < hp <= 100)[2]	0.16	0.15	-	g/hr	0.01	0.02	-
Air Compressor	Air Compressors (100 < hp <= 175)[2]	0.21	0.21	0.21	g/hr	0.05	0.09	0.05
Backhoe	Tractors/Loaders/Backhoes (75 < hp <= 100)[2]	0.10	0.09	0.09	g/hr	0.01	0.02	0.01
Concrete Pump	Pumps (300 < hp <= 600)[2]	0.71	0.70	0.70	g/hr	0.03	0.05	0.02
Dewatering Pump	Pumps (50 < hp <= 75)[2]	0.18	0.18	-	g/hr	0.03	0.06	-
Dozer	Crawler Tractor/Dozers (175 < hp <= 300)[2]	0.51	0.50	-	g/hr	0.03	0.04	-
Extension Forklift	Forklifts (100 < hp <= 175)[2]	0.28	0.28	0.28	g/hr	0.02	0.04	0.01
Generator	Generator Sets (300 < hp <= 600)[2]	0.75	0.74	0.74	g/hr	1.53	3.28	1.51
Handheld Plate Compactor	Plate Compactors (6 < hp <= 11)[2]	0.03	0.03	-	g/hr	0.005	0.01	-
Grader	Graders (175 < hp <= 300)[2]	0.50	0.49	0.49	g/hr	0.04	0.04	0.04
Vacuum Truck (purge lines)	Other Construction Equipment (175 < hp <= 300)[2]	0.52	0.52	-	g/hr	0.03	0.08	-
Roller Compactor - drum	Rollers (100 < hp <= 175)[2]	-	0.29	0.29	g/hr	-	0.06	0.03
Truck-Mounted Striper	Other General Industrial Eqp (50 < hp <= 75)[2]	-	-	0.21	g/hr	-	-	0.03
Welder	Welders (50 < hp <= 75)[2]	0.18	0.18	0.18	g/hr	0.02	0.04	0.02
Welder	Welders (75 < hp <= 100)[2]	0.23	0.23	0.23	g/hr	0.03	0.05	0.03
Asphalt Paver	Pavers (175 < hp <= 300)[2]	-	-	0.48	g/hr	-	-	0.06
Concrete Mixer	Cement & Mortar Mixers (300 < hp <= 600)[2]	0.73	0.72	0.72	g/hr	0.05	0.10	0.04
End Dump Truck	Single Unit Short-Haul Truck - idle[1]	0.07	0.07	0.07	g/hr	0.004	0.006	0.004
	Single Unit Short-Haul Truck - 25 mph[1]	0.01	0.01	0.01	g/mi			
	Single Unit Short-Haul Truck - start[1]	0.002	0.002	0.002	g/start			
Loader	Tractors/Loaders/Backhoes (175 < hp <= 300)[2]	0.20	0.19	0.19	g/hr	0.05	0.06	0.05
				TOTAL (lb/yr)		2.42	4.59	2.20
				TOTAL (tpy)		0.001	0.002	0.001

NOTES:

[1] Onroad - U.S. EPA MOtor Vehicle Emission Simulator (MOVES) 2014b; January, Hour 08:00-08:59, Weekdays; Virgin Islands St. Thomas; Rural Unrestricted Access, Off-Network; Non-Extended Idle Processes; Soak Time ≥ 720 minutes; assume all idle when only operating hours available (no VMT data);
Idle Emissions (lb/yr) = [Emission Factor (g/hr) x activity (hr/yr)]/(453.59 g/lb);
Running (25 mph) Emissions (lb/yr) = Emission Factor (g/mi) x activity (mi/yr)]/(453.59 g/lb);
Start Emissions (lb/yr) = Emission Factor (g/start) x 2 starts/trips x activity (trips/yr)]/(453.59 g/lb); activity (trips/yr) = No. of Trips x annual VMT/project total VMT;
2024 emission factors = 2023 emission factors.

[2] Nonroad - U.S. EPA MOtor Vehicle Emission Simulator (MOVES) 2014b; Weekdays, All Months; Virgin Islands St. Thomas except Honolulu Hawaii for Other General Industrial Eqp; All Processes; Maximum Monthly;
Emissions (lb/yr) = [Emission Factor (g/hr) x activity (hr/yr)]/(453.59 g/lb); 2024 emission factors = 2023 emission factors.

Appendix A
Air Quality - Emission Calculations

Equipment	Category	VOC Emission Factor				VOC Emissions (lb/yr)		
		2022	2023	2024	units	2022	2023	2024
GOVERNMENT OVERSIGHT								
Passenger Truck	Passenger Truck - idle[1]	1.30	1.16	1.16	g/hr	1.32	1.17	1.17
	Passenger Truck - 25 mph[1]	0.17	0.15	0.15	g/mi			
	Passenger Truck - start[1]	1.65	1.46	1.46	g/start			
CONSTRUCTION								
Passenger Vehicle (Light Pickup)	Passenger Truck - idle[1]	1.30	1.16	1.16	g/hr	6.01	5.32	5.32
	Passenger Truck - 25 mph[1]	0.17	0.15	0.15	g/mi			
	Passenger Truck - start[1]	1.65	1.46	1.46	g/start			
Passenger Vehicle (SUV)	Passenger Truck - idle[1]	1.30	1.16	1.16	g/hr	6.01	5.32	5.32
	Passenger Truck - 25 mph[1]	0.17	0.15	0.15	g/mi			
	Passenger Truck - start[1]	1.65	1.46	1.46	g/start			
Passenger Truck	Passenger Truck - idle[1]	1.30	1.16	1.16	g/hr	6.01	5.32	5.32
	Passenger Truck - 25 mph[1]	0.17	0.15	0.15	g/mi			
	Passenger Truck - start[1]	1.65	1.46	1.46	g/start			
Full-sized Pickup Truck	Passenger Truck - idle[1]	1.30	1.16	1.16	g/hr	6.01	5.32	5.32
	Passenger Truck - 25 mph[1]	0.17	0.15	0.15	g/mi			
	Passenger Truck - start[1]	1.65	1.46	1.46	g/start			
Flatbed Truck (semi-trailer)	Single Unit Short-Haul Truck - idle[1]	6.05	5.36	5.36	g/hr	1.67	1.49	1.49
	Single Unit Short-Haul Truck - 25 mph[1]	0.53	0.47	0.47	g/mi			
	Single Unit Short-Haul Truck - start[1]	0.05	0.05	0.05	g/start			
Excavator	Excavators (100 < hp <= 175)[2]	1.75	1.35	1.35	g/hr	0.12	0.23	0.05
Crawler Crane (pile driver)	Excavators (750 < hp <= 1000)[2]	42.54	38.28	38.28	g/hr	7.50	7.59	3.54
Light Crane (piping)	Cranes (75 < hp <= 100)[2]	2.24	1.79	-	g/hr	0.10	0.24	-
Air Compressor	Air Compressors (100 < hp <= 175)[2]	3.41	2.92	2.92	g/hr	0.75	1.29	0.64
Backhoe	Tractors/Loaders/Backhoes (75 < hp <= 100)[2]	9.10	7.12	7.12	g/hr	1.20	1.26	0.94
Concrete Pump	Pumps (300 < hp <= 600)[2]	27.76	24.91	24.91	g/hr	1.10	1.65	0.66
Dewatering Pump	Pumps (50 < hp <= 75)[2]	82.06	72.58	-	g/hr	14.47	25.60	-
Dozer	Crawler Tractor/Dozers (175 < hp <= 300)[2]	3.64	2.87	-	g/hr	0.24	0.25	-
Extension Forklift	Forklifts (100 < hp <= 175)[2]	0.88	0.77	0.77	g/hr	0.06	0.11	0.03
Generator	Generator Sets (300 < hp <= 600)[2]	29.17	26.18	26.18	g/hr	59.16	115.42	53.09
Handheld Plate Compactor	Plate Compactors (6 < hp <= 11)[2]	28.57	28.54	-	g/hr	4.536	6.29	-
Grader	Graders (175 < hp <= 300)[2]	3.46	2.72	2.72	g/hr	0.31	0.24	0.24
Vacuum Truck (purge lines)	Other Construction Equipment (175 < hp <= 300)[2]	7.81	6.76	-	g/hr	0.52	0.98	-
Roller Compactor - drum	Rollers (100 < hp <= 175)[2]	-	2.67	2.67	g/hr	-	0.53	0.32
Truck-Mounted Striper	Other General Industrial Eqp (50 < hp <= 75)[2]	-	-	36.28	g/hr	-	-	4.80
Welder	Welders (50 < hp <= 75)[2]	39.45	37.83	37.83	g/hr	4.35	8.67	4.17
Welder	Welders (75 < hp <= 100)[2]	48.32	46.42	46.42	g/hr	5.33	10.64	5.12
Asphalt Paver	Pavers (175 < hp <= 300)[2]	-	-	3.55	g/hr	-	-	0.42
Concrete Mixer	Cement & Mortar Mixers (300 < hp <= 600)[2]	28.42	26.09	26.09	g/hr	1.88	3.45	1.38
End Dump Truck	Single Unit Short-Haul Truck - idle[1]	6.05	5.36	5.36	g/hr	0.24	0.40	0.21
	Single Unit Short-Haul Truck - 25 mph[1]	0.53	0.47	0.47	g/mi			
	Single Unit Short-Haul Truck - start[1]	0.05	0.05	0.05	g/start			
Loader	Tractors/Loaders/Backhoes (175 < hp <= 300)[2]	13.55	10.75	10.75	g/hr	3.58	3.32	2.94
CONSTRUCTION - FUGITIVE								
Asphalt Paver	Asphalt Paving[3]	-	-	0.14	% by wt.	-	-	212800
				TOTAL (lb/yr)		132.46	212.11	212902.51
				TOTAL (tpy)		0.07	0.11	106.45

NOTES:

[1] Onroad - U.S. EPA MOtor Vehicle Emission Simulator (MOVES) 2014b; January, Hour 08:00-08:59, Weekdays; Virgin Islands St. Thomas; Rural Unrestricted Access, Off-Network; Non-Extended Idle Processes; Soak Time ≥ 720 minutes; assume all idle when only operating hours available (no VMT data);
Idle Emissions (lb/yr) = [Emission Factor (g/hr) x activity (hr/yr)]/(453.59 g/lb);
Running (25 mph) Emissions (lb/yr) = Emission Factor (g/mi) x activity (mi/yr)]/(453.59 g/lb);
Start Emissions (lb/yr) = Emission Factor (g/start) x 2 starts/trips x activity (trips/yr)]/(453.59 g/lb); activity (trips/yr) = No. of Trips x annual VMT/project total VMT;
2024 emission factors = 2023 emission factors.

[2] Nonroad - U.S. EPA MOtor Vehicle Emission Simulator (MOVES) 2014b; Weekdays, All Months; Virgin Islands St. Thomas except Honolulu Hawaii for Other General Industrial Eqp; All Processes; Maximum Monthly;
Emissions (lb/yr) = [Emission Factor (g/hr) x activity (hr/yr)]/(453.59 g/lb); 2024 emission factors = 2023 emission factors.

[3] U.S. EPA AP-42 Chapter 4.5 Asphalt Paving Operations; Table 4.5-1, assume medium cure, equivalent to 25% by volume of diluent in cutback.

Appendix A
Air Quality - Emission Calculations

Equipment	Category	CO2 Emission Factor				CO2 Emissions (lb/yr)		
		2022	2023	2024	units	2022	2023	2024
GOVERNMENT OVERSIGHT								
Passenger Truck	Passenger Truck - idle[1]	3730	3595	3595	g/hr	952	920	920
	Passenger Truck - 25 mph[1]	443	427	427	g/mi			
	Passenger Truck - start[1]	227	223	223	g/start			
CONSTRUCTION								
Passenger Vehicle (Light Pickup)	Passenger Truck - idle[1]	3730	3595	3595	g/hr	2519	2440	2440
	Passenger Truck - 25 mph[1]	443	427	427	g/mi			
	Passenger Truck - start[1]	227	223	223	g/start			
Passenger Vehicle (SUV)	Passenger Truck - idle[1]	3730	3595	3595	g/hr	2519	2440	2440
	Passenger Truck - 25 mph[1]	443	427	427	g/mi			
	Passenger Truck - start[1]	227	223	223	g/start			
Passenger Truck	Passenger Truck - idle[1]	3730	3595	3595	g/hr	2519	2440	2440
	Passenger Truck - 25 mph[1]	443	427	427	g/mi			
	Passenger Truck - start[1]	227	223	223	g/start			
Full-sized Pickup Truck	Passenger Truck - idle[1]	3730	3595	3595	g/hr	2519	2440	2440
	Passenger Truck - 25 mph[1]	443	427	427	g/mi			
	Passenger Truck - start[1]	227	223	223	g/start			
Flatbed Truck (semi-trailer)	Single Unit Short-Haul Truck - idle[1]	8174	8136	8136	g/hr	3998	3979	3979
	Single Unit Short-Haul Truck - 25 mph[1]	1300	1293	1293	g/mi			
	Single Unit Short-Haul Truck - start[1]	293	292	292	g/start			
Excavator	Excavators (100 < hp <= 175)[2]	43577	43578	43578	g/hr	2882	7494	1729
Crawler Crane (pile driver)	Excavators (750 < hp <= 1000)[2]	279869	279881	279881	g/hr	49361	55533	25916
Light Crane (piping)	Cranes (75 < hp <= 100)[2]	22369	22370	-	g/hr	986	2959	-
Air Compressor	Air Compressors (100 < hp <= 175)[2]	29493	29494	29494	g/hr	6502	13005	6502
Backhoe	Tractors/Loaders/Backhoes (75 < hp <= 100)[2]	12714	12720	12720	g/hr	1682	2243	1683
Concrete Pump	Pumps (300 < hp <= 600)[2]	90711	90719	90719	g/hr	3600	6000	2400
Dewatering Pump	Pumps (50 < hp <= 75)[2]	30146	29926	-	g/hr	5317	10556	-
Dozer	Crawler Tractor/Dozers (175 < hp <= 300)[2]	74580	74582	-	g/hr	4933	6577	-
Extension Forklift	Forklifts (100 < hp <= 175)[2]	42946	42946	42946	g/hr	2840	6249	1894
Generator	Generator Sets (300 < hp <= 600)[2]	95662	95671	95671	g/hr	194029	421839	194046
Handheld Plate Compactor	Plate Compactors (6 < hp <= 11)[2]	4735	4735	-	g/hr	752	1044	-
Grader	Graders (175 < hp <= 300)[2]	73218	73220	73220	g/hr	6457	6457	6457
Vacuum Truck (purge lines)	Other Construction Equipment (175 < hp <= 300)[2]	73997	74001	-	g/hr	4894	10768	-
Roller Compactor - drum	Rollers (100 < hp <= 175)[2]	-	41864	41864	g/hr	-	8307	4984
Truck-Mounted Striper	Other General Industrial Eqp (50 < hp <= 75)[2]	-	-	34826	g/hr	-	-	4607
Welder	Welders (50 < hp <= 75)[2]	30289	30269	30269	g/hr	3339	6940	3337
Welder	Welders (75 < hp <= 100)[2]	38081	38056	38056	g/hr	4198	8726	4195
Asphalt Paver	Pavers (175 < hp <= 300)[2]	-	-	70019	g/hr	-	-	8336
Concrete Mixer	Cement & Mortar Mixers (300 < hp <= 600)[2]	91782	91789	91789	g/hr	6070	12142	4857
End Dump Truck	Single Unit Short-Haul Truck - idle[1]	8174	8136	8136	g/hr	430	714	427
	Single Unit Short-Haul Truck - 25 mph[1]	1300	1293	1293	g/mi			
	Single Unit Short-Haul Truck - start[1]	293	292	292	g/start			
Loader	Tractors/Loaders/Backhoes (175 < hp <= 300)[2]	26276	26284	26284	g/hr	6951	8113	7185
				TOTAL (lb/yr)		320247	610323	293212
				TOTAL (tpy)		160.12	305.16	146.61

NOTES:

[1] Onroad - U.S. EPA MOtor Vehicle Emission Simulator (MOVES) 2014b; January, Hour 08:00-08:59, Weekdays; Virgin Islands St. Thomas; Rural Unrestricted Access, Off-Network; Non-Extended Idle Processes; Soak Time ≥ 720 minutes; assume all idle when only operating hours available (no VMT data);
Idle Emissions (lb/yr) = [Emission Factor (g/hr) x activity (hr/yr)]/(453.59 g/lb);
Running (25 mph) Emissions (lb/yr) = Emission Factor (g/mi) x activity (mi/yr)]/(453.59 g/lb);
Start Emissions (lb/yr) = Emission Factor (g/start) x 2 starts/trips x activity (trips/yr)]/(453.59 g/lb); activity (trips/yr) = No. of Trips x annual VMT/project total VMT;
2024 emission factors = 2023 emission factors.

[2] Nonroad - U.S. EPA MOtor Vehicle Emission Simulator (MOVES) 2014b; Weekdays, All Months; Virgin Islands St. Thomas except Honolulu Hawaii for Other General Industrial Eqp; All Processes; Maximum Monthly;
Emissions (lb/yr) = [Emission Factor (g/hr) x activity (hr/yr)]/(453.59 g/lb); 2024 emission factors = 2023 emission factors.

Appendix A
Air Quality - Emission Calculations

Equipment	Category	CH4 Emission Factor				CH4 Emissions (lb/yr)		
		2022	2023	2024	units	2022	2023	2024
GOVERNMENT OVERSIGHT								
Passenger Truck	Passenger Truck - idle[1]	0.02	0.02	0.02	g/hr	0.06	0.05	0.05
	Passenger Truck - 25 mph[1]	0.004	0.004	0.004	g/mi			
	Passenger Truck - start[1]	0.08	0.07	0.07	g/start			
CONSTRUCTION								
Passenger Vehicle (Light Pickup)	Passenger Truck - idle[1]	0.02	0.02	0.02	g/hr	0.27	0.24	0.24
	Passenger Truck - 25 mph[1]	0.004	0.004	0.004	g/mi			
	Passenger Truck - start[1]	0.08	0.07	0.07	g/start			
Passenger Vehicle (SUV)	Passenger Truck - idle[1]	0.02	0.02	0.02	g/hr	0.27	0.24	0.24
	Passenger Truck - 25 mph[1]	0.004	0.004	0.004	g/mi			
	Passenger Truck - start[1]	0.08	0.07	0.07	g/start			
Passenger Truck	Passenger Truck - idle[1]	0.02	0.02	0.02	g/hr	0.27	0.24	0.24
	Passenger Truck - 25 mph[1]	0.004	0.004	0.004	g/mi			
	Passenger Truck - start[1]	0.08	0.07	0.07	g/start			
Full-sized Pickup Truck	Passenger Truck - idle[1]	0.02	0.02	0.02	g/hr	0.27	0.24	0.24
	Passenger Truck - 25 mph[1]	0.004	0.004	0.004	g/mi			
	Passenger Truck - start[1]	0.08	0.07	0.07	g/start			
Flatbed Truck (semi-trailer)	Single Unit Short-Haul Truck - idle[1]	0.58	0.61	0.61	g/hr	0.19	0.20	0.20
	Single Unit Short-Haul Truck - 25 mph[1]	0.06	0.06	0.06	g/mi			
	Single Unit Short-Haul Truck - start[1]	0.03	0.03	0.03	g/start			
Excavator	Excavators (100 < hp <= 175)[2]	0.15	0.11	0.11	g/hr	0.01	0.02	0.00
Crawler Crane (pile driver)	Excavators (750 < hp <= 1000)[2]	3.39	3.15	3.15	g/hr	0.60	0.62	0.29
Light Crane (piping)	Cranes (75 < hp <= 100)[2]	0.18	0.15	-	g/hr	0.01	0.02	-
Air Compressor	Air Compressors (100 < hp <= 175)[2]	0.26	0.23	0.23	g/hr	0.06	0.10	0.05
Backhoe	Tractors/Loaders/Backhoes (75 < hp <= 100)[2]	0.27	0.22	0.22	g/hr	0.04	0.04	0.03
Concrete Pump	Pumps (300 < hp <= 600)[2]	1.14	1.07	1.07	g/hr	0.05	0.07	0.03
Dewatering Pump	Pumps (50 < hp <= 75)[2]	6.92	5.78	-	g/hr	1.22	2.04	-
Dozer	Crawler Tractor/Dozers (175 < hp <= 300)[2]	0.31	0.23	-	g/hr	0.02	0.02	-
Extension Forklift	Forklifts (100 < hp <= 175)[2]	0.07	0.06	0.06	g/hr	0.004	0.008	0.002
Generator	Generator Sets (300 < hp <= 600)[2]	1.20	1.13	1.13	g/hr	2.43	4.96	2.28
Handheld Plate Compactor	Plate Compactors (6 < hp <= 11)[2]	3.00	3.00	-	g/hr	0.48	0.66	-
Grader	Graders (175 < hp <= 300)[2]	0.29	0.21	0.21	g/hr	0.03	0.02	0.02
Vacuum Truck (purge lines)	Other Construction Equipment (175 < hp <= 300)[2]	0.60	0.54	-	g/hr	0.04	0.08	-
Roller Compactor - drum	Rollers (100 < hp <= 175)[2]	-	0.24	0.24	g/hr	-	0.05	0.03
Truck-Mounted Striper	Other General Industrial Eqp (50 < hp <= 75)[2]	-	-	2.30	g/hr	-	-	0.30
Welder	Welders (50 < hp <= 75)[2]	2.48	2.29	2.29	g/hr	0.27	0.53	0.25
Welder	Welders (75 < hp <= 100)[2]	3.12	2.88	2.88	g/hr	0.34	0.66	0.32
Asphalt Paver	Pavers (175 < hp <= 300)[2]	-	-	0.31	g/hr	-	-	0.04
Concrete Mixer	Cement & Mortar Mixers (300 < hp <= 600)[2]	1.11	1.07	1.07	g/hr	0.07	0.14	0.06
End Dump Truck	Single Unit Short-Haul Truck - idle[1]	0.58	0.61	0.61	g/hr	0.04	0.06	0.04
	Single Unit Short-Haul Truck - 25 mph[1]	0.06	0.06	0.06	g/mi			
	Single Unit Short-Haul Truck - start[1]	0.03	0.03	0.03	g/start			
Loader	Tractors/Loaders/Backhoes (175 < hp <= 300)[2]	0.67	0.51	0.51	g/hr	0.18	0.16	0.14
				TOTAL (lb/yr)		7.20	11.47	5.10
				TOTAL (tpy)		0.004	0.006	0.003

NOTES:

[1] Onroad - U.S. EPA MOtor Vehicle Emission Simulator (MOVES) 2014b; January, Hour 08:00-08:59, Weekdays; Virgin Islands St. Thomas; Rural Unrestricted Access, Off-Network; Non-Extended Idle Processes; Soak Time ≥ 720 minutes; assume all idle when only operating hours available (no VMT data);
Idle Emissions (lb/yr) = [Emission Factor (g/hr) x activity (hr/yr)]/(453.59 g/lb);
Running (25 mph) Emissions (lb/yr) = Emission Factor (g/mi) x activity (mi/yr)]/(453.59 g/lb);
Start Emissions (lb/yr) = Emission Factor (g/start) x 2 starts/trips x activity (trips/yr)]/(453.59 g/lb); activity (trips/yr) = No. of Trips x annual VMT/project total VMT;
2024 emission factors = 2023 emission factors.

[2] Nonroad - U.S. EPA MOtor Vehicle Emission Simulator (MOVES) 2014b; Weekdays, All Months; Virgin Islands St. Thomas except Honolulu Hawaii for Other General Industrial Eqp; All Processes; Maximum Monthly;
Emissions (lb/yr) = [Emission Factor (g/hr) x activity (hr/yr)]/(453.59 g/lb); 2024 emission factors = 2023 emission factors.

Appendix A
Air Quality - Emission Calculations

Equipment	Category	N2O Emission Factor				N2O Emissions (lb/yr)		
		2022	2023	2024	units	2022	2023	2024
GOVERNMENT OVERSIGHT								
Passenger Truck	Passenger Truck - idle[1]	-	-	-	-	0.03	0.03	0.03
	Passenger Truck - 25 mph[1]	-	-	-	-			
	Passenger Truck - start[1]	0.05	0.04	0.04	g/start			
CONSTRUCTION								
Passenger Vehicle (Light Pickup)	Passenger Truck - idle[1]	-	-	-	-	0.15	0.14	0.14
	Passenger Truck - 25 mph[1]	-	-	-	-			
	Passenger Truck - start[1]	0.05	0.04	0.04	g/start			
Passenger Vehicle (SUV)	Passenger Truck - idle[1]	-	-	-	-	0.15	0.14	0.14
	Passenger Truck - 25 mph[1]	-	-	-	-			
	Passenger Truck - start[1]	0.05	0.04	0.04	g/start			
Passenger Truck	Passenger Truck - idle[1]	-	-	-	-	0.15	0.14	0.14
	Passenger Truck - 25 mph[1]	-	-	-	-			
	Passenger Truck - start[1]	0.05	0.04	0.04	g/start			
Full-sized Pickup Truck	Passenger Truck - idle[1]	-	-	-	-	0.15	0.14	0.14
	Passenger Truck - 25 mph[1]	-	-	-	-			
	Passenger Truck - start[1]	0.05	0.04	0.04	g/start			
Flatbed Truck (semi-trailer)	Single Unit Short-Haul Truck - idle[1]	-	-	-	-	0.003	0.003	0.003
	Single Unit Short-Haul Truck - 25 mph[1]	-	-	-	-			
	Single Unit Short-Haul Truck - start[1]	0.01	0.01	0.01	g/start			
Excavator	Excavators (100 < hp <= 175)[2]	-	-	-	-	-	-	-
Crawler Crane (pile driver)	Excavators (750 < hp <= 1000)[2]	-	-	-	-	-	-	-
Light Crane (piping)	Cranes (75 < hp <= 100)[2]	-	-	-	-	-	-	-
Air Compressor	Air Compressors (100 < hp <= 175)[2]	-	-	-	-	-	-	-
Backhoe	Tractors/Loaders/Backhoes (75 < hp <= 100)[2]	-	-	-	-	-	-	-
Concrete Pump	Pumps (300 < hp <= 600)[2]	-	-	-	-	-	-	-
Dewatering Pump	Pumps (50 < hp <= 75)[2]	-	-	-	-	-	-	-
Dozer	Crawler Tractor/Dozers (175 < hp <= 300)[2]	-	-	-	-	-	-	-
Extension Forklift	Forklifts (100 < hp <= 175)[2]	-	-	-	-	-	-	-
Generator	Generator Sets (300 < hp <= 600)[2]	-	-	-	-	-	-	-
Handheld Plate Compactor	Plate Compactors (6 < hp <= 11)[2]	-	-	-	-	-	-	-
Grader	Graders (175 < hp <= 300)[2]	-	-	-	-	-	-	-
Vacuum Truck (purge lines)	Other Construction Equipment (175 < hp <= 300)[2]	-	-	-	-	-	-	-
Roller Compactor - drum	Rollers (100 < hp <= 175)[2]	-	-	-	-	-	-	-
Truck-Mounted Striper	Other General Industrial Eqp (50 < hp <= 75)[2]	-	-	-	-	-	-	-
Welder	Welders (50 < hp <= 75)[2]	-	-	-	-	-	-	-
Welder	Welders (75 < hp <= 100)[2]	-	-	-	-	-	-	-
Asphalt Paver	Pavers (175 < hp <= 300)[2]	-	-	-	-	-	-	-
Concrete Mixer	Cement & Mortar Mixers (300 < hp <= 600)[2]	-	-	-	-	-	-	-
End Dump Truck	Single Unit Short-Haul Truck - idle[1]	-	-	-	-	0.002	0.002	0.002
	Single Unit Short-Haul Truck - 25 mph[1]	-	-	-	-			
	Single Unit Short-Haul Truck - start[1]	0.005	0.005	0.005	g/start			
Loader	Tractors/Loaders/Backhoes (175 < hp <= 300)[2]	-	-	-	-	-	-	-
				TOTAL (lb/yr)		0.65	0.61	0.61
				TOTAL (tpy)		0.0003	0.0003	0.0003

NOTES:

[1] Onroad - U.S. EPA MOtor Vehicle Emission Simulator (MOVES) 2014b; January, Hour 08:00-08:59, Weekdays; Virgin Islands St. Thomas; Rural Unrestricted Access, Off-Network; Non-Extended Idle Processes; Soak Time ≥ 720 minutes; assume all idle when only operating hours available (no VMT data);
Idle Emissions (lb/yr) = [Emission Factor (g/hr) x activity (hr/yr)]/(453.59 g/lb);
Running (25 mph) Emissions (lb/yr) = Emission Factor (g/mi) x activity (mi/yr)]/(453.59 g/lb);
Start Emissions (lb/yr) = Emission Factor (g/start) x 2 starts/trips x activity (trips/yr)]/(453.59 g/lb); activity (trips/yr) = No. of Trips x annual VMT/project total VMT;
2024 emission factors = 2023 emission factors.

[2] Nonroad - U.S. EPA MOtor Vehicle Emission Simulator (MOVES) 2014b; Weekdays, All Months; Virgin Islands St. Thomas except Honolulu Hawaii for Other General Industrial Eqp; All Processes; Maximum Monthly;
Emissions (lb/yr) = [Emission Factor (g/hr) x activity (hr/yr)]/(453.59 g/lb); 2024 emission factors = 2023 emission factors.

Appendix A
Air Quality - Emission Calculations

Equipment	Fuel	hp	Operating Hours			No. of Trips	Vehicle Miles Traveled (mi)			Onsite Idling (hr) ---------- Material Handled* (ton/yr)		
			2022	2023	2024		2022	2023	2024	2022	2023	2024
GOVERNMENT OVERSIGHT												
Passenger Truck	GASOLINE	270	-	-	-	416	832	832	832	-	-	-
CONSTRUCTION												
Passenger Vehicle (Light Pickup)	GASOLINE	270	-	-	-	2192	1827	1827	1827	-	-	-
Passenger Vehicle (SUV)	GASOLINE	300	-	-	-	2192	1827	1827	1827	-	-	-
Passenger Truck	GASOLINE	285	-	-	-	2192	1827	1827	1827	-	-	-
Full-sized Pickup Truck	GASOLINE	355	-	-	-	2192	1827	1827	1827	-	-	-
Flatbed Truck (semi-trailer)	DIESEL	410	-	-	-	417	1251	1251	1251	13	13	13
Excavator	DIESEL	120	30	78	18	-	-	-	-	-	-	-
Crawler Crane (pile driver)	DIESEL	850	80	90	42	-	-	-	-	-	-	-
Light Crane (piping)	DIESEL	100	20	60	-	-	-	-	-	-	-	-
Air Compressor	DIESEL	145	100	200	100	-	-	-	-	-	-	-
Backhoe	DIESEL	80	60	80	60	-	-	-	-	-	-	-
Concrete Pump	DIESEL	380	18	30	12	-	-	-	-	-	-	-
Dewatering Pump	GASOLINE	50	80	160	-	-	-	-	-	-	-	-
Dozer	DIESEL	225	30	40	-	-	-	-	-	-	-	-
Extension Forklift	DIESEL	175	30	66	20	-	-	-	-	-	-	-
Generator	DIESEL	350	920	2000	920	-	-	-	-	-	-	-
Handheld Plate Compactor	GASOLINE	11	72	100	-	-	-	-	-	-	-	-
Grader	DIESEL	300	40	40	40	-	1.14	1.14	1.14	-	-	-
Vacuum Truck (purge lines)	DIESEL	300	30	66	-	-	-	-	-	-	-	-
Roller Compactor - drum	DIESEL	175	-	90	54	-	-	-	-	-	-	-
Truck-Mounted Striper	GASOLINE	75	-	-	60	-	-	-	-	-	-	-
Welder	GASOLINE	75	50	104	50	-	-	-	-	-	-	-
Welder	GASOLINE	100	50	104	50	-	-	-	-	-	-	-
Asphalt Paver*	DIESEL	300	-	-	54	-	-	-	-	-	-	-
										-	-	760
Concrete Mixer*	DIESEL	600	30	60	24	-	-	-	-	-	-	-
										198	395	158
End Dump Truck*	DIESEL	400	-	-	-	320	1.14	1.14	1.14	16	32	16
										6000	12000	6000
Loader*	DIESEL	300	120	140	124	-	-	-	-	-	-	-
										2300	2700	2400

Appendix A
Air Quality - Emission Calculations

Equipment	
Nonroad	**Onroad**
Excavators (100 < hp <= 175)	Passenger Truck - 25 mph
Excavators (750 < hp <= 1000)	Passenger Truck - idle
Cranes (75 < hp <= 100)	Passenger Truck - start
Air Compressors (100 < hp <= 175)	Single Unit Short-Haul Truck - 25 mph
Pavers (175 < hp <= 300)	Single Unit Short-Haul Truck - idle
Tractors/Loaders/Backhoes (75 < hp <= 100)	Single Unit Short-Haul Truck - start
Cement & Mortar Mixers (300 < hp <= 600)	
Pumps (300 < hp <= 600)	
Pumps (50 < hp <= 75)	
Crawler Tractor/Dozers (175 < hp <= 300)	
Forklifts (100 < hp <= 175)	
Generator Sets (300 < hp <= 600)	
Plate Compactors (6 < hp <= 11)	
Tractors/Loaders/Backhoes (175 < hp <= 300)	
Graders (175 < hp <= 300)	
Other Construction Equipment (175 < hp <= 300)	
Rollers (100 < hp <= 175)	
Other General Industrial Eqp (50 < hp <= 75)	
Welders (50 < hp <= 75)	
Welders (75 < hp <= 100)	

Appendix D
Record of Non-Applicability for Clean Air Act Conformity

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Record of Non-Applicability for Clean Air Act Conformity

Naval Base Guam
NAVY-COMMERCIAL TIE-IN HARDENING (MILCON P-661)

The Proposed Action falls under the Record of Non-Applicability (RONA) category and is documented with this RONA.

Proposed Action

Action Proponent: Commanding Officer, Naval Base Guam, Guam

Location: Pipeline Easement Causeway between Highway 18 & Highway 1, Apra Harbor, Guam

Proposed Action Name: Navy-Commercial Tie-In Hardening (MILCON P-661)

Proposed Action and Emissions Summary:

For the Proposed Action (MILCON P-661), the United States Navy (Navy), Navy Base Guam (NGB) proposes to replace an existing Navy/Commercial petroleum, oil, and lubricant (POL) tie-in, with a new, hardened tie-in facility. The new tie-in facility would be located to the southeast of the existing tie-in within the pipeline easement causeway between Highway 18 and Highway 1, in the vicinity of Apra Harbor, Guam. The use of the causeway for POL pipelines includes a 40-foot wide Navy pipeline easement that is separated from the 30-foot wide commercial (TriStar) pipeline easement by a 5-foot wide gap of GovGuam-owned land. The Preferred Alternative includes infrastructure and site improvements that will be constructed on both easements and the unencumbered GovGuam land.

Site preparation would include clearing, grubbing, and earthwork. The construction site would be approximately 100 feet by 80 feet. Both ends of the access road would be improved by adding a six-inch layer of gravel along the entire 2,000 feet and widening it from the current six feet to 10 feet.

During the initial stage of construction, bypass pipelines would be installed to route the existing Navy pipelines around the proposed new hardened tie-in facility. Dewatering would be required during construction and sheet piles would likely to be used to limit the extent of excavation. Sheets would be driven with a vibratory hammer and would remain in place for the duration of the below grade construction.

The new hardened tie-in structure would house the valve vault and tie-in equipment to the Navy pipelines. The new structure has exterior dimensions of approximately 56 feet by 26 feet

with a gross floor area of 1,456 square feet. The structure will be approximately 25.5 feet tall, and the valve vault would have a pit depth of approximately six feet below finished grade (approximately six feet above mean sea level). An additional seismic isolation valve pit would be constructed. The new hardened tie-in structure would be constructed with reinforced concrete roof slabs and walls supported on concrete piles. Equipment needed for pile installation generally consists of a crawler-mounted pile driving crane with a pile driving hammer mounted on leads fixed to the crane, and a second crane to lift and position piles during the driving. It is anticipated that a hydraulic and/or diesel impact hammer would be used for pile installation.

After the new tie-in facility is completed, the new hardened structure and upgraded access road would be constructed, the concrete walls of the existing Navy tie-in facility would be removed, and the existing valves would be replaced with straight pipe and then buried. The existing tie-in facility consists of two concrete block, open-topped vaults that are approximately 17 feet by 28 feet and 17 feet by 18 feet, respectively.

Construction of a 20-foot wide (minimum) paved access road would require earthwork, fill, and grading. This would include the installation of approximately 650 linear feet of grouted rip rap along the causeway embankment. Pole-mounted roadway lighting shall be provided from the two entrance gates to the hardened structure. A fence and gate of at least seven feet above finished grade would be provided at each entry point of the access road. Footings for the fence and gate would extend approximately 3.5 feet below grade.

The proposed action would include the following utilities: new 8-inch water service line under the new access road; relocation and adjustment of an existing collection handling and transport wastewater line; electrical utilities along the entire length of the causeway; and new communications lines housed in the concrete duct bank.

Once construction of the proposed action is completed, operations of the Navy and commercial tie-in valves would continue similar to current conditions. The proposed action would not affect the intensity of operations or maintenance required for the facilities. Therefore, the proposed action would not affect on-base or on-island staffing levels.

The proposed action would be implemented over a three year period starting in 2022. Estimated sulfur dioxide emissions of the proposed action for each project year are presented in Table 1 below.

Table 1. Estimated Emissions for Proposed Action

Project Year	Sulfur Dioxide (ton per year)
2022	< 0.01
2023	< 0.01
2024	< 0.01
General Conformity de minimis Threshold (tpy)	*100*

Affected Air Basins: Piti Power Plant and Piti-Cabras, Guam

Date RONA Prepared: October 28, 2021

RONA prepared by: Naval Facilities Engineering Command, Pacific

Proposed Action Exemption

The proposed action is exempt from the Clean Air Act General Conformity Rule because the proposed action's projected emissions are below the applicable *de minimis* threshold.

Attainment Area Status and Emissions Evaluation Conclusions

The project area is located within the Guam Piti-Cabras and Piti Power Plant areas, which have been designated nonattainment for sulfur dioxide, unclassified for particles with an aerodynamic diameter less than or equal to a nominal 10 micrometers, and unclassifiable/attainment for carbon monoxide, ozone, nitrogen dioxide, lead, and particles with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers.

Since the proposed action's projected emissions in Table 1 do not exceed the de minimis threshold, the proposed action is exempt from the Clean Air Act General Conformity Rule.

RONA Approval:

Signature: _____

Name/Rank: Edward Moon/GS-13 Civilian Date: October 29, 2021

Position: Installation Environmental Program Director, By Direction

Activity Data

Equipment	Fuel	hp	Operating Hours			No. of Trips	Vehicle Miles Traveled (mi)			Onsite Idling (hr) ---------- Material Handled* (ton/yr)		
			2022	2023	2024		2022	2023	2024	2022	2023	2024
GOVERNMENT OVERSIGHT												
Passenger Truck	GASOLINE	270	-	-	-	416	832	832	832	-	-	-
CONSTRUCTION												
Passenger Vehicle (Light Pickup)	GASOLINE	270	-	-	-	2192	1827	1827	1827	-	-	-
Passenger Vehicle (SUV)	GASOLINE	300	-	-	-	2192	1827	1827	1827	-	-	-
Passenger Truck	GASOLINE	285	-	-	-	2192	1827	1827	1827	-	-	-
Full-sized Pickup Truck	GASOLINE	355	-	-	-	2192	1827	1827	1827	-	-	-
Flatbed Truck (semi-trailer)	DIESEL	410	-	-	-	417	1251	1251	1251	13	13	13
Excavator	DIESEL	120	30	78	18	-	-	-	-	-	-	-
Crawler Crane (pile driver)	DIESEL	850	80	90	42	-	-	-	-	-	-	-
Light Crane (piping)	DIESEL	100	20	60	-	-	-	-	-	-	-	-
Air Compressor	DIESEL	145	100	200	100	-	-	-	-	-	-	-
Backhoe	DIESEL	80	60	80	60	-	-	-	-	-	-	-
Concrete Pump	DIESEL	380	18	30	12	-	-	-	-	-	-	-
Dewatering Pump	GASOLINE	50	80	160	-	-	-	-	-	-	-	-
Dozer	DIESEL	225	30	40	-	-	-	-	-	-	-	-
Extension Forklift	DIESEL	175	30	66	20	-	-	-	-	-	-	-
Generator	DIESEL	350	920	2000	920	-	-	-	-	-	-	-
Handheld Plate Compactor	GASOLINE	11	72	100	-	-	-	-	-	-	-	-
Grader	DIESEL	300	40	40	40	-	1.14	1.14	1.14	-	-	-
Vacuum Truck (purge lines)	DIESEL	300	30	66	-	-	-	-	-	-	-	-
Roller Compactor - drum	DIESEL	175	-	90	54	-	-	-	-	-	-	-
Truck-Mounted Striper	GASOLINE	75	-	-	60	-	-	-	-	-	-	-
Welder	GASOLINE	75	50	104	50	-	-	-	-	-	-	-

Equipment	Fuel	hp	Operating Hours			No. of Trips	Vehicle Miles Traveled (mi)			Onsite Idling (hr) ---------- Material Handled* (ton/yr)		
			2022	2023	2024		2022	2023	2024	2022	2023	2024
Welder	GASOLINE	100	50	104	50	-	-	-	-	-	-	-
Asphalt Paver*	DIESEL	300	-	-	54	-	-	-	-	-	-	-
										-	-	760
Concrete Mixer*	DIESEL	600	30	60	24	-	-	-	-	-	-	-
										198	395	158
End Dump Truck*	DIESEL	400	-	-	-	320	1.14	1.14	1.14	16	32	16
										6000	12000	6000
Loader*	DIESEL	300	120	140	124	-	-	-	-	-	-	-
										2300	2700	2400

Emissions

Equipment	Category	SO2 Emission Factor				SO2 Emissions (lb/yr)		
		2022	2023	2024	units	2022	2023	2024
GOVERNMENT OVERSIGHT								
Passenger Truck	Passenger Truck - idle[1]	0.02	0.02	0.02	g/hr	0.01	0.01	0.01
	Passenger Truck - 25 mph[1]	0.003	0.003	0.003	g/mi			
	Passenger Truck - start[1]	0.002	0.001	0.001	g/start			
CONSTRUCTION								
Passenger Vehicle (Light Pickup)	Passenger Truck - idle[1]	0.02	0.02	0.02	g/hr	0.02	0.02	0.02
	Passenger Truck - 25 mph[1]	0.003	0.003	0.003	g/mi			
	Passenger Truck - start[1]	0.002	0.001	0.001	g/start			
Passenger Vehicle (SUV)	Passenger Truck - idle[1]	0.02	0.02	0.02	g/hr	0.02	0.02	0.02
	Passenger Truck - 25 mph[1]	0.003	0.003	0.003	g/mi			
	Passenger Truck - start[1]	0.002	0.001	0.001	g/start			
Passenger Truck	Passenger Truck - idle[1]	0.02	0.02	0.02	g/hr	0.02	0.02	0.02
	Passenger Truck - 25 mph[1]	0.003	0.003	0.003	g/mi			
	Passenger Truck - start[1]	0.002	0.001	0.001	g/start			
Full-sized Pickup Truck	Passenger Truck - idle[1]	0.02	0.02	0.02	g/hr	0.02	0.02	0.02
	Passenger Truck - 25 mph[1]	0.003	0.003	0.003	g/mi			
	Passenger Truck - start[1]	0.002	0.001	0.001	g/start			
Flatbed Truck (semi-trailer)	Single Unit Short-Haul Truck - idle[1]	0.07	0.07	0.07	g/hr	0.03	0.03	0.03
	Single Unit Short-Haul Truck - 25 mph[1]	0.01	0.01	0.01	g/mi			
	Single Unit Short-Haul Truck - start[1]	0.002	0.002	0.002	g/start			
Excavator	Excavators (100 < hp <= 175)[2]	0.29	0.29	0.29	g/hr	0.02	0.05	0.01
Crawler Crane (pile driver)	Excavators (750 < hp <= 1000)[2]	1.99	1.97	1.97	g/hr	0.35	0.39	0.18
Light Crane (piping)	Cranes (75 < hp <= 100)[2]	0.16	0.15	-	g/hr	0.01	0.02	-
Air Compressor	Air Compressors (100 < hp <= 175)[2]	0.21	0.21	0.21	g/hr	0.05	0.09	0.05
Backhoe	Tractors/Loaders/Backhoes (75 < hp <= 100)[2]	0.10	0.09	0.09	g/hr	0.01	0.02	0.01
Concrete Pump	Pumps (300 < hp <= 600)[2]	0.71	0.70	0.70	g/hr	0.03	0.05	0.02
Dewatering Pump	Pumps (50 < hp <= 75)[2]	0.18	0.18	-	g/hr	0.03	0.06	-
Dozer	Crawler Tractor/Dozers (175 < hp <= 300)[2]	0.51	0.50	-	g/hr	0.03	0.04	-

Equipment	Category	SO2 Emission Factor				SO2 Emissions (lb/yr)		
		2022	2023	2024	units	2022	2023	2024
Extension Forklift	Forklifts (100 < hp <= 175)[2]	0.28	0.28	0.28	g/hr	0.02	0.04	0.01
Generator	Generator Sets (300 < hp <= 600)[2]	0.75	0.74	0.74	g/hr	1.53	3.28	1.51
Handheld Plate Compactor	Plate Compactors (6 < hp <= 11)[2]	0.03	0.03	-	g/hr	0.005	0.01	-
Grader	Graders (175 < hp <= 300)[2]	0.50	0.49	0.49	g/hr	0.04	0.04	0.04
Vacuum Truck (purge lines)	Other Construction Equipment (175 < hp <= 300)[2]	0.52	0.52	-	g/hr	0.03	0.08	-
Roller Compactor - drum	Rollers (100 < hp <= 175)[2]	-	0.29	0.29	g/hr	-	0.06	0.03
Truck-Mounted Striper	Other General Industrial Eqp (50 < hp <= 75)[2]	-	-	0.21	g/hr	-	-	0.03
Welder	Welders (50 < hp <= 75)[2]	0.18	0.18	0.18	g/hr	0.02	0.04	0.02
Welder	Welders (75 < hp <= 100)[2]	0.23	0.23	0.23	g/hr	0.03	0.05	0.03
Asphalt Paver	Pavers (175 < hp <= 300)[2]	-	-	0.48	g/hr	-	-	0.06
Concrete Mixer	Cement & Mortar Mixers (300 < hp <= 600)[2]	0.73	0.72	0.72	g/hr	0.05	0.10	0.04
End Dump Truck	Single Unit Short-Haul Truck - idle[1]	0.07	0.07	0.07	g/hr	0.004	0.006	0.004
	Single Unit Short-Haul Truck - 25 mph[1]	0.01	0.01	0.01	g/mi			
	Single Unit Short-Haul Truck - start[1]	0.002	0.002	0.002	g/start			
Loader	Tractors/Loaders/Backhoes (175 < hp <= 300)[2]	0.20	0.19	0.19	g/hr	0.05	0.06	0.05
				TOTAL (lb/yr)		2.42	4.59	2.20
				TOTAL (tpy)		0.001	0.002	0.001

NOTES:

[1] Onroad - U.S. EPA MOtor Vehicle Emission Simulator (MOVES) 2014b; January, Hour 08:00-08:59, Weekdays; Virgin Islands St. Thomas; Rural Unrestricted Access, Off-Network; Non-Extended Idle Processes; Soak Time ≥ 720 minutes; assume all idle when only operating hours available (no VMT data); 2024 emission factors = 2023 emission factors;

Idle Emissions (lb/yr) = [Emission Factor (g/hr) x activity (hr/yr)]/(453.59 g/lb);

Running (25 mph) Emissions (lb/yr) = Emission Factor (g/mi) x activity (mi/yr)]/(453.59 g/lb);

Start Emissions (lb/yr) = Emission Factor (g/start) x 2 starts/trips x activity (trips/yr)]/(453.59 g/lb); activity (trips/yr) = No. of Trips x annual VMT/project total VMT.

[2] Nonroad - U.S. EPA MOtor Vehicle Emission Simulator (MOVES) 2014b; Weekdays, All Months; Virgin Islands St. Thomas except Honolulu Hawaii for Other General Industrial Eqp; All Processes; Maximum Monthly; 2024 emission factors = 2023 emission factors;

Emissions (lb/yr) = [Emission Factor (g/hr) x activity (hr/yr)]/(453.59 g/lb).