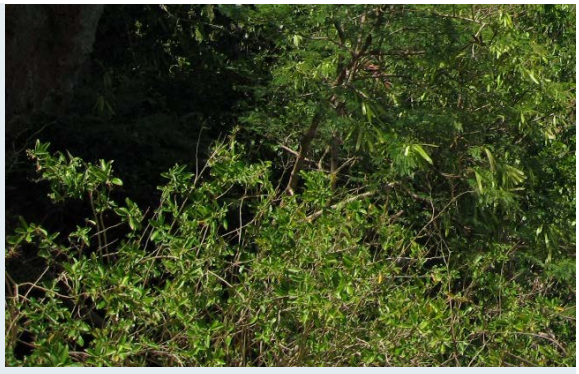
Final

SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT

FOR TINIAN DIVERT INFRASTRUCTURE IMPROVEMENTS, COMMONWEALTH OF THE NORTHERN MARIANA ISLANDS

UNITED STATES AIR FORCE



July 2020

PRIVACY ADVISORY

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Cover Sheet
Supplemental Environmental Impact Statement
for Tinian Divert Infrastructure Improvements

Responsible Agency: U.S. Air Force (USAF)

Cooperating Agencies: Federal Aviation Administration, Joint Region Marianas

Report Designation: Final Supplemental Environmental Impact Statement (SEIS)

Abstract: This SEIS addresses proposed changes since the September 2016 completion of the Environmental Impact Statement (EIS) for Divert Activities and Exercises ("2016 Divert EIS") and Record of Decision (ROD), signed December 7, 2016. The ROD announced the USAF decision to select the Modified Tinian Alternative (Final EIS, Section 2.7), and specifically the North Option (Final EIS, Section 2.5.2), as a future Divert location. The 2016 Divert ROD and 2016 Divert EIS are available for review or download from the project website at: http://pacafdivertmarianaseis.com/archive.

The 2016 Divert EIS evaluated the proposal to construct facilities and infrastructure at the Tinian International Airport to support cargo, tanker, and similar aircraft and associated support personnel for divert operations, periodic exercises, and humanitarian assistance and disaster relief (Final EIS, Section 2.5.2). This SEIS addresses USAF's supplemental proposal to construct and operate a fuel pipeline and associated infrastructure at the seaport to transport fuel from the seaport to the airport, and to improve certain existing roads between the seaport and airport to support Divert activities.

After the ROD was signed in December 2016, USAF conducted further evaluation of fuel transfer methods and associated infrastructure, including the feasibility of other alternatives that were not considered in the 2016 Divert EIS. USAF now proposes to construct and operate a fuel pipeline from the Tinian seaport to Tinian International Airport, to include a booster pump house and associated fire protection systems, a boom storage building, and necessary utility connections at the seaport. The proposed pipeline would eliminate the need for bulk fuel storage tanks at the Tinian seaport and the need for fuel tanker trucks to transport fuel from the seaport to the airport, both analyzed in the 2016 Divert EIS; however, the other components of the fuel system evaluated in the 2016 Divert EIS would not change (Final EIS, Section 2.5.2). USAF also proposes to improve certain existing roads between the seaport and airport that would be used to support Divert activities. No other actions associated with the Divert Activities and Exercise project would differ from what was presented for the Modified Tinian Alternative, North Option, in the 2016 Divert EIS. The No Action Alternative for the pipeline and roadway proposals are the conditions described as the Modified Tinian Alternative, North Option, in the 2016 Divert EIS, the potential impacts of which are presented in this SEIS.

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SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT

FOR

TINIAN DIVERT INFRASTRUCTURE IMPROVEMENTS

HEADQUARTERS PACIFIC AIR FORCES (HQ PACAF)

JOINT BASE PEARL HARBOR-HICKAM, HAWAIʻI

JULY 2020

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Abbreviations and Acronyms

ACAM	Air Conformity Applicability Model
ACHP	Advisory Council on Historic Preservation
ADT	average daily traffic
AFOSH	Air Force Occupational Safety and Health
APC	Area of Particular Concern
API	American Petroleum Institute
APE	Area of Potential Effect
AQCR	air quality control region
ARFF	Aircraft Rescue and Firefighting
AST	aboveground storage tank
bbl	barrel
BECQ	Bureau of Environmental and Coastal Quality
BMP	best management practice
CAA	Clean Air Act
CEDS	Comprehensive Economic Development Strategic
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CGP	Construction General Permit
CJMT	Commonwealth of the Northern Mariana Islands Joint Military Training
CNMI	Commonwealth of the Northern Mariana Islands
CO	carbon monoxide
COC	community of comparison
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
CPA	Commonwealth Ports Authority
CRM	Coastal Resources Management
CUC	Commonwealth Utilities Corporation
CW	conditional worker
CWA	Clean Water Act
CZMA	Coastal Zone Management Act
dB	decibel
dBA	A-weighted decibel
DCRM	Division of Coastal Resources Management
DNL	day-night sound level
DOD	Department of Defense
DPS	Department of Public Safety
DPL	Department of Public Lands
EFH	Essential Fish Habitat
EIAP	Environmental Impact Analysis Process
EIS	Environmental Impact Statement
EISA	Energy Independence and Security Act
EO	Executive Order
ESA	Endangered Species Act
ESCP	erosion and sediment control plan
FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FPPA	Farmland Protection Policy Act
FR	Federal Register
GDP	gross domestic product
GEPA	Guam Environmental Protection Agency
GHG	greenhouse gas
gpd	gallons per day
gpm	gallons per minute
HAP	hazardous air pollutant
HIES	Household Income and Expenditure Survey
HUD	U.S. Department of Housing and Urban Development
IBB	International Broadcasting Bureau
ICS	Incident Command System
ILS	instrument landing system
LOS	level of service
$\mu g/m^3$	micrograms per cubic meter
MBTA	Migratory Bird Treaty Act

mg/m^3	milligrams per cubic meter
MIRC	Mariana Islands Range Complex
MITT	Mariana Island Testing and Training Activities
MLA	Military Lease Area
mph	miles per hour
MSFCMA	Magnuson-Stevens Fishery Conservation and Management Act
MSL	mean sea level
MW	megawatt
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NKK	Nanʻyō Kōhatsu Kaisha
NMFS	National Marine Fisheries Service
NMTIT	Northern Marianas territorial income tax
NO_2	nitrogen dioxide
NO_x	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NRHP	National Register of Historic Places
NSR	noise sensitive receptor
O_3	ozone
OSHA	Occupational Safety and Health Administration
P.L.	Public Law
PA	Programmatic Agreement
Pb	lead
PIM Plan	Pipeline Integrity Management Plan
$PM_{2.5}$	particulate matter equal to or less than 2.5 microns in diameter
PM_{10}	particulate matter equal to or less than 10 microns in diameter
ppb	parts per billion
PPE	personal protective equipment
ppm	parts per million
PSD	Prevention of Significant Deterioration
RCRA	Resource Conservation and Recovery Act
ROD	Record of Decision
ROI	Region of Influence
ROW	right-of-way
RPZ	Runway Protection Zone
RTA	range and training area
SDWA	Safe Drinking Water Act
SEIS	Supplemental Environmental Impact Statement
SHPO	State Historic Preservation Officer
SIP	State Implementation Plan
SO_2	sulfur dioxide
SPCC	Spill Prevention, Control, and Countermeasure
SWPPP	Storm Water Pollution Prevention Plan
TCP	Traditional Cultural Property
tpy	tons per year
TR	Tinian Route
UFC	Unified Facilities Criteria
USACE	U.S. Army Corps of Engineers
USAF	U.S. Air Force
USC	United States Code
USCB	U.S. Census Bureau
USEPA	U.S. Environmental Protection Agency
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
UXO	unexploded ordnance
VOC	volatile organic compound
vs.	versus
WPRFMC	Western Pacific Region Fishery Management Council

1. Purpose of and Need for the Proposed Actions

1.1 Introduction

This Supplemental Environmental Impact Statement (SEIS) addresses proposed changes since the September 2016 completion of the Environmental Impact Statement (EIS) for Divert Activities and Exercises ("2016 Divert EIS") and Record of Decision (ROD), signed December 7, 2016. The ROD announced the U.S. Air Force (USAF) decision to select the Modified Tinian Alternative (Final EIS, Section 2.7), and specifically the North Option (Final EIS, Section 2.5.2), as a future Divert location. The 2016 Divert ROD and 2016 Divert EIS are available for review or download from the project website at: http://pacafdivertmarianaseis.com/archive.

In the 2016 Divert EIS, USAF proposed to construct facilities and infrastructure at the Tinian International Airport (North Option) to support cargo, tanker, and similar aircraft and associated support personnel for divert operations, periodic exercises, and humanitarian assistance and disaster relief (Final EIS, Section 2.5.2). The 2016 Divert EIS evaluated construction of fuel infrastructure at the Tinian airport and seaport, and also evaluated fuel transport from the seaport to the airport by tanker truck (Final EIS, Section 2.5.2). After the ROD was signed in December 2016, USAF conducted further evaluation of fuel transfer methods and associated infrastructure, including the feasibility of different alternatives that were not considered in the 2016 Divert EIS. USAF now proposes to construct and operate a fuel pipeline, and associated infrastructure at the seaport, to transport fuel from the seaport to the airport. The proposed pipeline would eliminate the need for bulk fuel storage tanks at the Tinian seaport and the need for fuel tanker trucks to transport fuel from the seaport to the airport, both analyzed in the 2016 Divert EIS; however, the other components of the fuel system evaluated in the 2016 Divert EIS would not change (Final EIS, Section 2.5.2). USAF also proposes to improve certain existing roads between the seaport and airport to support Divert activities. **Table 2.1-1** (see **Section 2.1**) provides a comparison of the actions proposed in the 2016 Divert EIS and those proposed in this SEIS.

This SEIS was developed from the Draft SEIS, which was prepared for public distribution prior to landfall of Typhoon Yutu on Tinian in October 2018. USAF recognizes that Typhoon Yutu caused island-wide damage on Tinian and altered the manmade and natural environment on the island. USAF conducted visual inspections on Tinian post-Typhoon Yutu and examined areas proposed for infrastructure in support of the Tinian Divert Infrastructure Improvements. During these inspections, USAF determined that no changes were necessary to the Tinian Divert Infrastructure Improvements that were proposed during scoping in May 2018, and which are presented in **Section 2** of this SEIS. USAF also gathered information regarding the existing conditions of resource areas analyzed in this SEIS. USAF reconsidered these conditions upon completion of the Draft SEIS, during review of comments on the Draft SEIS, and in finalization of this SEIS. The impact analyses presented in **Sections 2.6**, **4**, and **5** are based on the potential impacts that could result from implementation of the Proposed Actions, described in **Section 2**, on the resource conditions as they are described in **Section 3**.

1.2 Proposed Project Location

The improvements proposed by USAF and presented in this SEIS are focused on the Island of Tinian in the Commonwealth of the Northern Mariana Islands (CNMI) (see **Figure 1.2-1**). The CNMI and Mariana Islands Archipelago are an integral part of the United States and straddle the Pacific Ocean and the Philippine Sea. As a former United Nations Trust Territory, the CNMI has a unique relationship with the federal government. Although not one of the 50 states of the union, the CNMI has, by agreement with the United States, entered into a political union with the United States making it a part of the United States governed in accordance with Article IV, Section 3 of the U.S. Constitution.

The Covenant to Establish a Commonwealth of the Northern Mariana Islands in Political Union with the United States of America (Covenant) (48 United States Code [USC] § 1801 et seq.) provides the basis for the relationship between the people of the CNMI and the United States. The United States and the CNMI government, through the adoption of the Covenant and the CNMI Constitution, recognized the importance of land ownership for the culture and traditions of the people of the Northern Mariana Islands; the Covenant provides for unique property rights to protect the CNMI people against exploitation and to promote their economic advancement and self-sufficiency, while also recognizing their status as U.S. citizens subject to the sovereignty rights of the United States.

USAF recognizes that the CNMI and federal governments have established a policy concerning use of real property that includes the joint use of civilian airfields and harbors on Tinian (see Covenant Article VIII; 48 USC § 1801 et seq.). As part of the Covenant agreement, the United States retained certain use and entry rights at the civilian facilities of West Field in Tinian (i.e., Tinian International Airport), and certain lease, entry, and use rights at Tinian harbor for military purposes (Covenant Article VIII; Section 802 and 803). Furthermore, Article VIII of the Covenant recognizes the right of the United States, as a sovereign government, to acquire property for public purpose. This sovereign right is limited, by mutual agreement between the CNMI and the United States, to acquiring the minimum area necessary to accomplish the public purpose and seeking only the minimum interest in real property necessary to support such public purpose. USAF intends to continue to respect this agreement in the development of any proposed facilities or infrastructure at the Tinian seaport and Tinian International Airport in accordance with 48 USC § 1801 et seq.

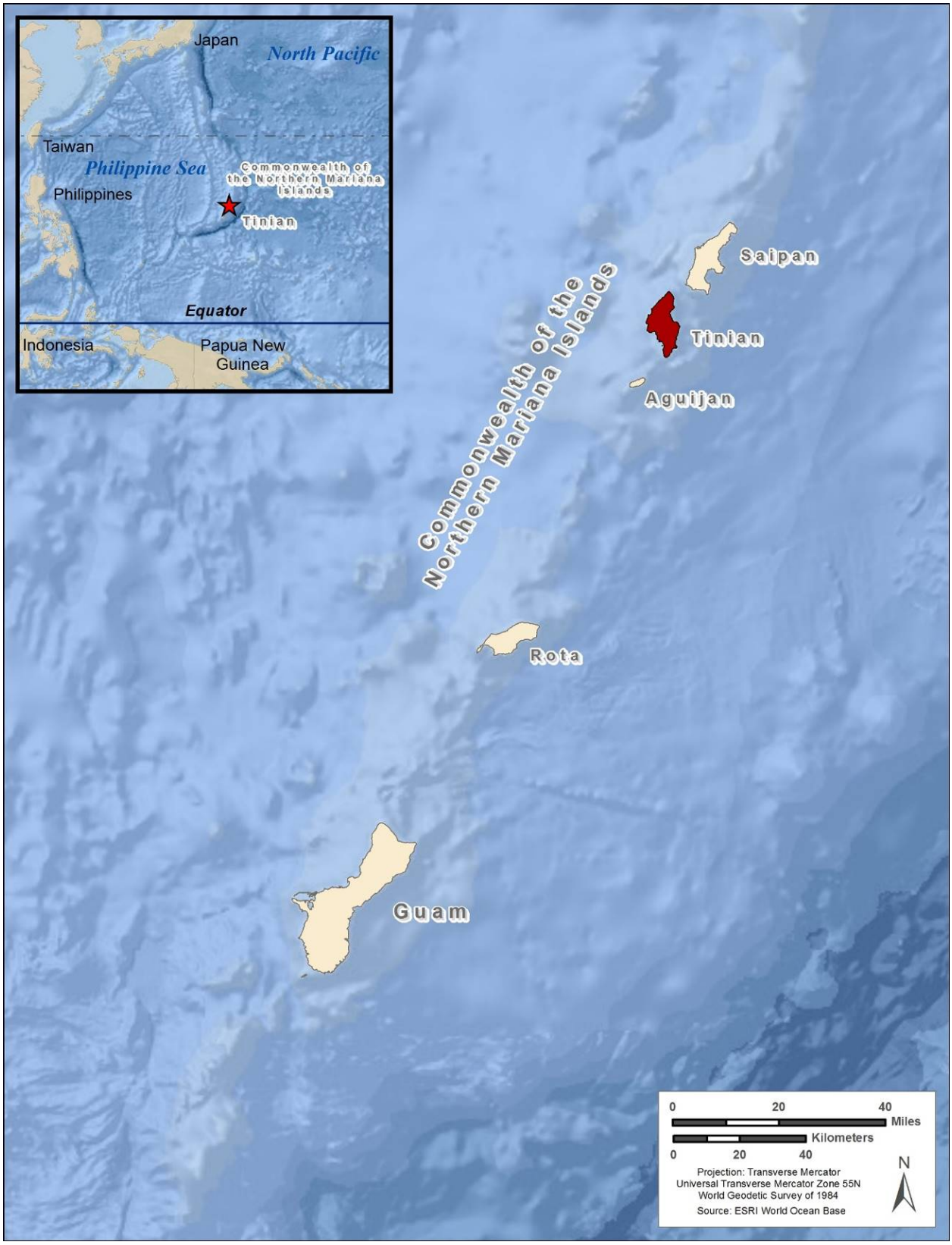

Figure 1.2-1. Tinian, CNMI Location Map

1.3 Purpose and Need

The overall purpose and need in this SEIS remain unchanged from those stated in the 2016 Divert EIS (Final EIS, Sections 1.3.1 and 1.3.2) and are described in **Section 1.3**. The purpose and need for the two Proposed Actions addressed in this SEIS are discussed in further detail in **Section 1.3.2**.

1.3.1 Purpose and Need for 2016 Divert Environmental Impact Statement

The purpose of the original Proposed Action is to establish divert capabilities to support and conduct current, emerging, and future USAF exercises, while ensuring the capability to meet mission requirements in the event that access to Andersen Air Force Base or other western Pacific locations is limited or denied.

The original Proposed Action is needed because there is no existing divert or contingency airfield on U.S. territory in the western Pacific that is designed and designated to provide strategic operational and exercise capabilities for U.S. forces when needed, or that supports humanitarian assistance and disaster relief in times of natural or man-made disasters.

1.3.2 Purpose and Need for Supplemental Environmental Impact Statement

After the ROD was signed, USAF further evaluated fuel transfer methods and surface transportation network on Tinian in consultation with the CNMI Department of Public Lands (DPL) and Commonwealth Ports Authority (CPA). USAF sought to determine, through these consultations, if there was a more safe, efficient, and secure alternative for fuel delivery to the airport than transporting via fuel tank trucks, and if the existing transportation network could support the anticipated Divert vehicles, as were studied in the 2016 Divert EIS (Final EIS, Section 2.5.2).

Pipeline and Support Infrastructure. The purpose of the proposed fuel pipeline and support infrastructure is to provide fuel from the seaport to bulk storage tanks at Tinian International Airport. The fuel pipeline would result in lower overall lifecycle costs for fuel transfer and eliminate the need for construction of fuel tanks at the seaport and transfer of fuel by tanker truck. The pipeline and support infrastructure are needed to provide a safer, more reliable, secure, efficient, and less costly method than was analyzed in the 2016 Divert EIS. According to a recent study, in terms of barrels (bbls) spilled per year, transporting oil and gasoline by truck is the least secure method of transportation. The study shows that trucks spilled more oil and gasoline than rail or pipeline, averaging around 326 bbls per million tons moved every mile by truck, 269 bbls per million tons moved every mile by pipeline, and 83 bbls per million tons moved every mile by rail (Strata 2017). When it comes to human health and safety, the same study states that pipeline is the safest method of transporting oil and gasoline. Oil and gasoline transportation by pipeline resulted in 1.7 fatalities to operators, personnel, and the general public per year in the United States. Rail transportation resulted in 2.4 fatalities and transportation by truck killed 10.2 people per year (Strata 2017).

Roadway Improvements. The purpose of the proposed surface road improvements is to facilitate heavy vehicle traffic that is anticipated under the overall Divert project, while ensuring

the roads continue to provide adequate service to the local community. The roadway improvements are needed because recent reconnaissance surveys and information received from Tinian officials indicate that roadways anticipated to be used for the overall Divert project are in varying stages of disrepair and inadequate to support the heavy vehicle traffic that will be required to build the Divert infrastructure and, if required, transfer fuel via tanker truck.

1.4 The Environmental Impact Analysis Process

The National Environmental Policy Act (NEPA) of 1969 (42 USC §§ 4321–4347) is a federal statute requiring the identification and analysis of potential environmental impacts associated with proposed federal actions before those actions are taken. The intent of NEPA is to support decision makers in making well-informed decisions based on an understanding of the potential environmental consequences, and taking actions to protect, restore, or enhance the environment. Title II of NEPA established the Council on Environmental Quality (CEQ), which was charged with the development and implementation of regulations and ensuring federal agency compliance with NEPA.

The process for implementing NEPA is codified in 40 Code of Federal Regulations (CFR) §§ 1500–1508, Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act. CEQ regulations specify that an EIS be prepared when a federal agency proposes a major action with the potential to significantly affect the quality of the human environment. As directed by 40 CFR § 1502.9, a supplement to an EIS is prepared when substantial changes are made to a proposed action relevant to environmental concerns, when there are significant new circumstances or information relevant to environmental concerns or bearing on the proposed action or its impacts, or when the purposes of NEPA will be furthered by completion of a supplement. The SEIS focuses on issues specific to the proposed fuel pipeline and support infrastructure and roadway improvements; it does not address components that have not changed from the 2016 Divert EIS and ROD.

Air Force Policy Directive 32-70, *Environmental Considerations in Programs and Activities,* states that USAF will comply with applicable federal, state, and local environmental laws and regulations, including NEPA. The USAF implementing regulation for NEPA is its Environmental Impact Analysis Process (EIAP), 32 CFR § 989, as amended.

In accordance with CEQ regulations implementing NEPA, and with the intent of reducing the potential encyclopedic nature that could result in this document, this SEIS incorporates by reference relevant material from the Divert Activities and Exercises Final EIS and ROD (USAF 2016a, USAF 2016b). These documents are also available for review or download from the project website at http://pacafdivertmarianaseis.com/archive.

Specifically, this SEIS incorporates by reference the affected environment described for CNMI and Tinian in Section 3 of the 2016 Divert EIS (Final EIS, Section 3); the affected environment described in **Sections 3.1 through 3.12** of this SEIS has been adopted from the 2016 Divert EIS to avoid repetitiveness and duplication of content. To facilitate reader review and understanding of the affected environment, **Sections 3.1 through 3.12** each provide a brief summary from the 2016 Divert EIS of the respective resource area and include updated information, where applicable and available. Resource area information in **Section 3** was

updated based on the physical areas being proposed for action, the type of action being proposed and the nature of potential impacts on that resource area, or because the resource has changed. Additionally, this SEIS incorporates by reference the cumulative projects addressed in the 2016 Divert EIS analysis of cumulative impacts (Final EIS, Sections 5.2.1 and 5.2.2) and the cumulative impacts analysis for the Modified Tinian Alternative, North Option (Final EIS, Section 5.3). The cumulative effects analysis in **Section 5** of this SEIS takes into consideration actions identified since completion of the 2016 Divert SEIS with considerable potential for cumulative impacts if implemented concurrently with the Proposed Actions. **Sections 5.2.1 through 5.2.3** describe cumulative impacts on resources areas that would differ from those presented in the 2016 Divert EIS.

1.5 Interagency and Public Involvement

Compliance with EIAP (32 CFR § 989.24) and CEQ regulations for implementing NEPA (40 CFR § 1506.6) requires several steps to ensure public and agency involvement in the process. Executive Order (EO) 12372, *Intergovernmental Review of Federal Programs*, as amended by EO 12416 of the same name, requires federal agencies to provide opportunities for consultation by elected officials of state and local governments that would be directly affected by a federal proposal.

1.5.1 Lead and Cooperating Agencies

The lead agency for the SEIS is the Department of the Air Force. Cooperating agencies include the Federal Aviation Administration (FAA) and Joint Region Marianas, as commanded by the U.S. Navy; both agencies were also cooperating agencies on the 2016 Divert EIS (Final EIS, Section 1.7.1). **Appendix A** includes copies of the cooperating agency request and acceptance correspondence.

Joint Region Marianas' role as a cooperating agency stems from its responsibilities as the executive agent for Department of Defense (DOD) in the proposed project location. FAA's role as a cooperating agency stems from its responsibilities pursuant to 49 USC § 40101 et seq. for civil aviation and regulation of air commerce in the interests of aviation safety and efficiency. FAA has special expertise and jurisdiction by law to approve proposed development at civilian airports, to include installation of the proposed fuel pipeline on airport property. To facilitate FAA review and adoption of the SEIS, **Table 1.5-1** cross-references USAF impact categories analyzed in the SEIS with FAA impact categories listed in Appendix A of FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*. Additionally, Section 4(f) of the U.S. Department of Transportation Act of 1966 is applicable to the Proposed Action because FAA, an agency in the Department of Transportation, could adopt the SEIS for their use. The Section 4(f) analysis presented in the 2016 Divert EIS (Final EIS, Section 1.7.2) for construction at the Tinian International Airport is applicable to this Proposed Action.

Table 1.5-1. FAA Impact Topics

FAA Impact Categories	SEIS Section
Air Quality	Air Quality
Coastal Resources	Land Use
Compatible Land Use	Noise, Land Use
Construction Impacts	Throughout Section 4
Department of Transportation Act: Sec. 4(f)	2016 Divert EIS (Final EIS, Section 1.7.2)
Farmlands	Geology and Soils
Fish, Wildlife, and Plants	Biological Resources
Floodplains	Water
Hazardous Materials, Pollution Prevention, and Solid Waste	Hazardous Materials and Wastes
Historical, Architectural, Archaeological, and Cultural Resources	Cultural Resources
Light Emissions and Visual Impacts	Light Emissions – Not Applicable Visual Impacts – Not Applicable
Natural Resources and Energy Supply	Infrastructure and Utilities
Noise	Noise
Secondary (Induced) Impacts	Secondary impacts are identified as "indirect" impacts
Socioeconomic Impacts, Environmental Justice, and Children's Environmental Health and Safety Risks	Socioeconomics, Environmental Justice and the Protection of Children
Water Quality	Water
Wetlands	Water, Biological Resources
Wild and Scenic Rivers	Not Applicable

1.5.2 Public Involvement

1.5.2.1 Public Scoping

Scoping is used to involve the public early in the environmental planning process and to solicit input from the public and interested agencies on the nature and extent of issues and impacts to be addressed and the methods by which potential impacts are evaluated. Scoping for the SEIS differs from that conducted for the 2016 Divert EIS (Final EIS, Section 1.7.3). According to 40 CFR § 1502.9, the agency shall prepare, circulate, and file a supplement to an EIS in the same fashion (exclusive of scoping) as a draft and final EIS, unless alternative procedures are approved by CEQ.

USAF determined that conducting public scoping for the proposed infrastructure improvements would help inform interested stakeholders and provide transparency through a mutual exchange of information. The public scoping period for the SEIS began on April 19, 2018, with publication of the Notice of Intent in the *Federal Register,* and ended on May 31, 2018. Concurrent with the publication of the Notice of Intent, USAF published newspaper advertisements in the *Marianas Variety* and *Saipan Tribune* and distributed scoping notification letters to the distribution list from the 2016 Divert EIS. All scoping notifications provided a brief description of the Proposed Actions and alternatives and requested the public submit comments in a timely manner to

ensure consideration in the SEIS. USAF requested the public to provide comments via the project website, at the scoping meeting, or through postal mail. USAF also held one public scoping meeting on Tinian on May 17, 2018, at Tinian Elementary School, to invite public comment on the proposed infrastructure improvements. The meeting was held in an open house format where citizens could review display boards about the Proposed Actions and speak individually with USAF personnel. **Appendix B** includes materials developed in support of the public scoping period.

1.5.2.2 Public and Agency Draft SEIS Review

USAF released the Draft SEIS to the public and agencies for review and comment. The Draft SEIS public comment period was 45 days and began on the Notice of Availability publication date, May 17, 2019, and ended on July 1, 2019. The Notice of Availability was published in the *Federal Register*; in local newspapers, the *Saipan Tribune* and *Marianas Variety*; on the project website at http://www.PACAFDivertMarianasEIS.com; and in letters accompanying the direct mailing of the Draft SEIS. Copies of the Draft SEIS were sent to federal and CNMI agencies, elected officials, nongovernmental organizations, and interested individuals. One public hearing was held on Tinian from 5 p.m. until 8 p.m. on June 6, 2019.

The first 30 minutes of the public hearing were held in an open house format with poster stations where USAF representatives were available to speak with the public and answer questions. After the open house session, the military judge called the public hearing to order. The call to order was followed by a presentation, given by USAF representatives, about the Proposed Actions, alternatives, and potential impacts presented in the Draft SEIS. Formal public testimony was welcomed after the presentation until 8 p.m., when the military judge adjourned the hearing. Materials that supported the Draft SEIS public review are provided in **Appendix G**.

While all comments submitted during the Draft SEIS public review were assessed and considered by USAF, only substantive comments are addressed, either individually or collectively, in this SEIS, consistent with 40 CFR § 1503.4. Substantive comments are regarded as those comments that challenge the analysis, methodologies, or information in the Draft SEIS as being factually inaccurate or analytically inadequate and may result in revisions to the SEIS; identify impacts not analyzed or identify reasonable alternatives or feasible mitigations not considered by the agency; or offer specific information that may have a bearing on the decision such as differences in interpretations of significance, scientific data, or technical conclusions. Non-substantive comments, which do not require a USAF response, are generally considered those comments that express a conclusion, an opinion, or a vote for or against the proposal itself, or some aspect of it; state a position for or against a particular alternative; or otherwise state a personal preference or opinion. Copies of all comments received on the Draft SEIS and responses to substantive comments are provided in **Appendix G**.

1.5.3 Agency Consultation

Consultation is required with various authorities during the impact analysis process, as described in the 2016 Divert EIS (Final EIS, Section 1.7.2). **Table 1.5-2** lists consultation requirements for this SEIS and includes the status of each consultation. For consultations that

result in USAF commitment to corresponding mitigations, the USAF will fully consider these mitigations in the decision-making process, prior to signature of a ROD.

Table 1.5-2. Consultation Requirements

Agency	Consultation	Status
CNMI State Historic Preservation Officer (SHPO)	Section 106 under the National Historic Preservation Action (NHPA)	USAF conducted Section 106 consultation with the CNMI SHPO and consulting parties regarding the Undertaking, Area of Potential Effect, historic properties, and potential effects. Section 106 consultation resulted in an Amendment, executed on March 3, 2020 to the 2016 *Programmatic Agreement among the Pacific Air Forces, Directorate of the Strategy, Plans, and Programs, the Commonwealth of the Northern Mariana Islands State Historic Preservation Office, and the Advisory Council on Historic Preservation Regarding the Proposed Construction and Operation of Divert Activities and Exercises within the Commonwealth of the Northern Mariana Islands*, *by Pacific Air Forces, the CNMI Governor on behalf of the CNMI SHPO, and the Advisory Council on Historic Preservation.*
U.S. Fish and Wildlife Service (USFWS)	Section 7 under the ESA for Terrestrial Species	USAF has developed a Biological Assessment and determined that the Proposed Actions would have no effect on terrestrial threatened and endangered species. Based on this determination, neither informal nor formal consultation under Section 7 is required.
National Marine Fisheries Service (NMFS)	Section 7 under the ESA for Marine Species	USAF developed a Biological Assessment and determined that the Proposed Actions may affect, but are not likely to adversely affect, marine threatened and endangered species. On November 19, 2018, NMFS concurred with the USAF effect determinations.
NMFS	Effects on Essential Fish Habitat (EFH) under the Magnuson-Stevens Fishery Conservation and Management Act	USAF developed an EFH Assessment and determined that adverse effects on EFH from the Proposed Actions would be none to minimal. On April 29, 2019, NMFS concurred with this determination.
CNMI Division of Coastal Resources Management (DCRM)	Compliance with the Coastal Zone Management Act (CZMA)	USAF submitted a determination to CNMI DCRM that the Proposed Actions would be consistent to the maximum extent practicable with the enforceable policies of the CNMI coastal zone management program. On August 8, 2019, CNMI DCRM provided a conditional concurrence with the USAF determination.

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2. Description of the Proposed Actions and Alternatives

In accordance with CEQ regulations (40 CFR § 1502.14[d]) and the USAF EIAP (32 CFR § 989.8), this section describes the Proposed Actions and alternatives USAF is considering to fulfill its purpose of and need for action. As discussed in **Section 1.4**, the NEPA process evaluates potential environmental consequences associated with proposed actions and considers alternative courses of action. Reasonable alternatives must satisfy the purpose of and need for a proposed action, as defined in **Section 1.3**. In addition, CEQ regulations specify the inclusion of a No Action Alternative for each Proposed Action against which potential impacts can be compared. The No Action Alternatives are analyzed in detail in accordance with CEQ regulations.

2.1 Proposed Actions

To meet the purposes and needs described in **Section 1.3**, USAF proposes the following actions:

- Construct and operate a fuel pipeline from the Tinian seaport to the Tinian International Airport, to include a booster pump house and associated fire protection systems, a boom storage building, necessary utility connections at the seaport, and additional support infrastructure.
- Improve certain existing roads between the seaport and airport that were previously analyzed for Divert vehicles in the 2016 Divert EIS (Final EIS, Section 2.5.2).

Each Proposed Action is independent of the other and has standalone value for supporting the Divert Activities and Exercises project. While full implementation of each Proposed Action would result in the greatest benefit for the Divert project, each of the Proposed Actions would also benefit the Divert project if implemented alone. No other actions associated with the Divert Activities and Exercises project would differ from what was presented in the 2016 Divert EIS (Final EIS, Section 2.5.2), including but not limited to: infrastructure proposed at the airport; supporting utilities, fencing, and access roads; fuel delivery and offload; aircraft operations; operational support personnel; and mitigations for these actions including construction monitoring, stormwater management, and general road repair. **Table 2.1-1** provides a comparison of the actions proposed in the 2016 Divert EIS and those proposed in this SEIS.

Figures 2.2-1 and 2.2-4 (see **Section 2.2.1**) provide locations of the pipeline and support infrastructure proposed in this SEIS, as well as land areas that were addressed in the 2016 Divert EIS for construction and associated laydown areas, utilities, proposed mitigations, and long-term lease. **Figure 2.3-1** (see **Section 2.3.2**) identifies the existing roadways proposed for improvements.

Table 2.1-1. Comparison of 2016 Divert EIS and 2019 SEIS Proposed Action Components on Tinian

Proposed Action Element	2016 Divert EIS Modified Tinian North	2019 SEIS Pipeline and Support Infrastructure	2019 SEIS Roadway Improvements
Airport Taxiway	Included	No change	No change
Airport Parking Apron	Included	No change	No change
Airport Fuel Hydrant System	Included	No change	No change
Airport Cargo Pad	Included	No change	No change
Airport Maintenance Facility	Included	No change	No change
8th Ave (TR25) Reroute around Proposed Taxiway	Included	No change	No change
Airport Infrastructure Access Roads	Included	No change	No change
Airport Fuel Storage	Included	No change	No change
Airport Fuel Pump Tanks and Wells	Included	No change	No change
Airport Fire Pump Tanks and Wells	Included	No change	No change
Airport Utility Installation/Upgrade	Included	No change	No change
Airport Infrastructure Fencing	Included	No change	No change
Local Lodging for up to 265 Personnel	Included	No change	No change
Aircraft Operations	Included	No change	No change
Construction Workers	Included	Additional workers required to support construction of the pipeline	Additional workers required to support construction of the roadway improvements
Fuel Truck Trips from Seaport to Airport	Included	Removed from consideration	No change
Construction Truck Trips	Included	Additional trips required to support construction of the pipeline	Additional trips required to support construction of the roadway improvements
Minor Roadway Repairs on Fuel and Construction Truck Routes	Included	No change	No change
Roadway Improvements on Fuel Truck Route	Not included	Not included	Included
Seaport Fuel Storage	Included	Removed from consideration	No change
Fuel Delivery and Offload at the Seaport	Included	No change	No change
Seaport Utility Installation/Upgrade	Included	Included but adjusted for change in proposed infrastructure at seaport	No change
Seaport Infrastructure Fencing	Included	Included but adjusted for change in proposed infrastructure at seaport	No change

Proposed Action Element	2016 Divert EIS Modified Tinian North	2019 SEIS Pipeline and Support Infrastructure	2019 SEIS Roadway Improvements
Pipeline from Seaport to Airport	Not included	Included	Not included
Seaport Pipeline Support Infrastructure	Not included	Included	Not included
Mitigations from 2016 Divert EIS	Included	No change	No change

Included: Indicates the element is included as part of the analysis for that Proposed Action

Not Included: Indicates the element is not part of the analysis for that Proposed Action

No Change: Indicates the element has not changed since analysis as part of the Modified Tinian North Proposed Action in the 2016 Divert EIS

Removed from Consideration: Indicates the element would not be included as part of the Divert proposal, under that Proposed Action

2.2 Fuel Pipeline and Support Infrastructure

Fuel Pipeline Construction and Operation. The proposed fuel pipeline would eliminate the need for bulk fuel storage tanks at the Tinian seaport, and the need for fuel tanker trucks to transport fuel from the seaport to the airport, as described in the 2016 Divert EIS (Final EIS, Section 2.5.2). However, the other components of the fuel infrastructure system evaluated in the 2016 Divert EIS would not change (Final EIS, Section 2.5.2).

The proposed fuel pipeline would be designed and constructed in accordance with all appropriate federal, CNMI, DOD, and USAF regulations for petroleum fuel pipelines and facilities, including Unified Facilities Criteria (UFC) 3-460-01 *Petroleum Fuel Facilities*. As stated in UFC 3-460-01, Section 2-13.1, it is the firm policy of DOD to design and construct fueling facilities in a manner that will prevent damage to the environment by accidental discharge of fuels, their vapors, or residues.

The fuel pipeline and fuel facilities also would be constructed in accordance with seismic and tropical requirements, including those for seismic and wind loads outlined in American Society of Civil Engineers Standard 7-10 *Minimum Design Loads for Buildings and Other Structures*, UFC 3-310-04 S*eismic Design for Buildings,* UFC 3-301-01 *Structural Engineering,* and UFC 3-440-05N *Tropical Engineering*. Prior to finalizing the design for and constructing the fuel pipeline, USAF would conduct a geotechnical investigation along the pipeline route to classify the subsurface composition and identify the presence of any faults. Results of the geotechnical investigation would be incorporated into the final pipeline design, which would adhere to specifications in American Society of Mechanical Engineers Standard B31.3 *Process Piping* and B31.4 *Transportation Systems for Liquids and Slurries*. The design could include buried low friction interfaces to allow pipes to move during fault lines movement.

Portions of the proposed pipeline would be constructed at Tinian International Airport and the Tinian seaport on public land acquired or leased by USAF and proposed for construction in the 2016 Divert EIS (Final EIS, Section 2.5.2). The pipeline would also be constructed on public land within easement rights held by the U.S. federal government that allow it to install, operate, and maintain fuel infrastructure and other utilities. Appropriate routing for use of these easement rights would be coordinated with the CNMI, platted, and recorded.

The pipeline would be constructed underground to limit exposure to external factors, such as weather, environmental corrosion pressure, and foot and vehicle traffic, and prevent breaches, vandalism, sabotage, or any other means to disrupt the flow of fuel. The pipeline would be seamless along its length, and the girth of the pipeline would be welded in the field. The pipeline would be installed to a depth of approximately 3 feet; however, the pipeline could be installed deeper than 3 feet at intersection crossings. The pipeline would also be installed within a 20-foot easement; however, the impacts analysis in the SEIS will assume that an 80-foot-wide corridor could be disturbed during construction to allow for materials laydown and routing adjustments.

Once installed, the pipeline would occupy 6 feet of unencumbered space, allowing for a minimum of 2 feet on either side of the pipeline, within the 20-foot easement. The utility easement would be marked aboveground with pipeline utility markers in accordance with applicable regulations. USAF would retain the 20-foot utility easement to allow for maintenance of the pipeline when required. The easement may prevent or allow removal of certain surface plants but primary management of the surface with the utility easement is typically the responsibility of the landowner.

The pipeline would be constructed and installed in two separate sections. The first section would include a bulk receipt pipeline that would connect a new seaport turbine bulk receipt header to a booster pump house. The bulk receipt pipeline would be an approximately 14-inch diameter, externally coated, carbon steel pipe. The second section of the pipeline would be a transfer pipeline to connect the booster pump house to the Divert bulk receipt fuel tanks on the north side of the airport. The transfer pipeline would be an approximately 12-inch diameter, externally coated, carbon steel pipe. The transfer pipeline would be equipped with an impressed current cathodic protection system and would be designed to allow for cleaning and testing of the pipeline between the seaport and the airport.

Low point drains would be installed at the seaport header and approximately every 500 feet along the second section of pipeline. These points would be used to drain water or particulate matter from the pipe or to fully drain the pipe if required. Low point drains would be installed in pits lined with fiberglass to prevent infiltration to the subsurface soils or groundwater and would allow access below ground surface. Drained material would be removed from the pits via a vacuum truck, or similar process. Pits would be equipped with traffic rated covers and locked for security.

Fuel pipeline construction would occur over the course of approximately 2 to 3 years. Once the pipeline is installed, jet fuel would be delivered to and offloaded at the Tinian seaport per the existing fuel supply chain and fuel receipt protocols, as described in the 2016 Divert EIS (Final EIS, Section 2.5.2), and consistent with the No Action Alternative. Currently, fuel deliveries occur at the Tinian seaport an average of once per month and these monthly deliveries would be utilized to initially fill the fuel tanks. Once the fuel tanks are filled, monthly deliveries would be utilized on an as needed basis to “top off” the fuel tanks. Fuel deliveries and operation of the pipeline would be managed by USAF until Defense Logistics Agency capitalization of the pipeline. Once offloaded at the existing seaport bulk receipt header, the jet fuel would then enter the bulk receipt pipeline rather than being transferred to bulk fuel storage tanks. The

pipeline rate of flow would be approximately 2,000 gallons per minute (gpm). Required jet fuel volumes to support Divert activities and exercises would not change from that described in the 2016 Divert EIS (Final EIS, Section 2.5.2); approximately 220,000 bbls of jet fuel (9.24 million gallons) would be transferred through the pipeline to fill the two 60,000-bbl tanks and one 100,000-bbl tank at the airport.

For fuel infrastructure operation and maintenance, USAF and their contractors would follow UFC 3-460-03 *Operation and Maintenance: Maintenance of Petroleum Facilities*. USAF also would comply with USAF Technical Order 37-1-1 *General Operations and Inspection of Installed Fuel Storage and Dispensing Systems*, AFI 23-201 *Fuels Management,* AFI 32-1067 *Water and Fuels Systems*, and AFI 32-7044 *Storage Tank Environmental Compliance* for the operation of the fuel pipeline and support facilities. A static line pipeline leak detection system that is listed by the National Work Group On Leak Detection Evaluations would be permanently installed and would be U.S. Environmental Protection Agency (USEPA) third-party-certified. The pipeline leak detection system would comply with American Petroleum Institute (API) Recommended Practice 1130, *Computational Pipeline Monitoring,* and be able to detect a leak of 0.004 percent of the pipeline volume within one hour.

USAF would develop a memorandum of understanding with U.S. Coast Guard and USEPA to define the "point of demarcation" to facilitate compliance with applicable sections of 40 CFR § 112 *Oil Pollution Prevention*, 33 CFR § 154 *Facilities Transferring Oil or Hazardous Materials in Bulk*, and 33 CFR § 156 *Oil and Hazardous Material Transfer Operations*. Additionally, a Spill Prevention, Control, and Countermeasure (SPCC) Plan and a Facility Response Plan would be implemented in compliance with the Clean Water Act (CWA) and the regulations contained in 40 CFR § 112.

The safe, efficient, and economical operation of petroleum storage, dispensing systems, and associated infrastructure depends largely on an effective and proactive recurring maintenance program. USAF would follow UFC 3-460-03 for pipeline maintenance, which establishes the required frequency intervals for the recurring maintenance. Operation and maintenance of the pipeline would be managed by a Pipeline Integrity Management Plan (PIM Plan) to assist with and guide pipeline integrity maintenance. PIM Plans improve the integrity management of piping systems and help prevent leaks or pipeline failures. The plans are developed based on the principles of API Standard 570, *Inspection, Repair, Alteration, and Rerating of In-Service Piping Systems*, and federal and local regulations. Additional information on compliance actions and industry standards is included in **Appendix F**.

USAF would complete the final detailed design for the fuel pipeline, to include operation and maintenance planning, after issuance of the ROD for this SEIS, and completion of the geotechnical investigation. The final detailed design for the fuel pipeline would comply with applicable regulations and industry standards that direct pipeline design, construction, maintenance, and operation and are outlined in **Appendix F.** These design standards and requirements provide an adequate baseline for determining impacts under NEPA in this SEIS. As noted previously in this Section and in UFC 3-460-01, Section 2-13.1, it is the firm policy of the DOD to design and construct fueling facilities in a manner that will prevent damage to the environment by accidental discharge.

Support Infrastructure Construction and Operation. A booster pump house and boom storage building would be constructed near the seaport to support the fuel pipeline operations. The booster pump house and boom storage building would be co-located with a construction laydown yard, biosecurity area, parking area, sanitary sewer septic tank system with leach field, water storage tanks for fire suppression, bioinfiltration swales, and utility lines and connections within the area shown in **Figure 2.2-1**. Gravel pedestrian pathways and access roads would also be created or widened within this area; all existing roads would remain open to the public. Two diesel generators would also be installed to operate the support facilities during an outage. Up to 8.23 acres could be utilized and disturbed for development of all seaport support infrastructure.

As described for the fuel pipeline, all petroleum fuel support facilities would be designed and constructed in accordance with all appropriate federal, CNMI, DOD, and USAF regulations for petroleum fuel facilities, including UFC 3-460-01 *Petroleum Fuel Facilities*. Additionally, all applicable permits required from 2016 Divert EIS would be obtained (Final EIS, Section 4.16). The booster pump house would contain the leak detection monitoring system and be sized to fit three pumps and include a pump room, control room, mechanical room, and toilet. The pump house would be approximately 3,750 square feet and constructed with an automatic fire suppression system. The pump house would contain three electric 350-horsepower motors to transfer the fuel to the Divert bulk receipt fuel tanks at the airport. During fuel transfer operations, only two of the motors would operate, while the third would be kept idle as a spare. The pump house would also require installation of water and electric utilities, underground or overhead, which would be extended from existing service lines and along the utility easement.

The boom storage building would be constructed in proximity to the booster pump house for the storage of fuel spill containment booms and fuel transfer hose supplies. The building would require overhead door access for ease of loading/unloading. The estimated size of the storage building would be approximately 800 square feet.

The proposed seaport support infrastructure would be constructed in the same location at the Tinian seaport as the location proposed in the 2016 Divert EIS for the two 50,000-bbl fuel storage tanks (Final EIS, Section 2.5.2). The proposed fuel pipeline would eliminate the need for these bulk fuel storage tanks at the seaport proposed in the 2016 Divert EIS. The combined impervious surface footprint of the support infrastructure proposed in this SEIS (4,550 square feet) would be approximately half the size of the fuel storage tanks and support structures (7,534 square feet) proposed in the 2016 Divert EIS at the same location. Additionally, the combined area of potential disturbance proposed at the seaport in this SEIS (8.23 acres) is in the same area as the fuel storage tank area (5.29 acres) proposed in the 2016 Divert EIS. Therefore, much of the analysis presented in the 2016 Divert EIS (Final EIS, Section 4) for construction of the fuel storage tanks is applicable to the proposed construction of the support infrastructure at the seaport, including the booster pump house and boom storage building. **Figure 2.2-1** presents the support infrastructure location at the seaport compared to the previously analyzed footprint of the seaport bulk fuel tanks. Both support facilities would be enclosed within a secure fenced area (see **Figure 2.2-1**).

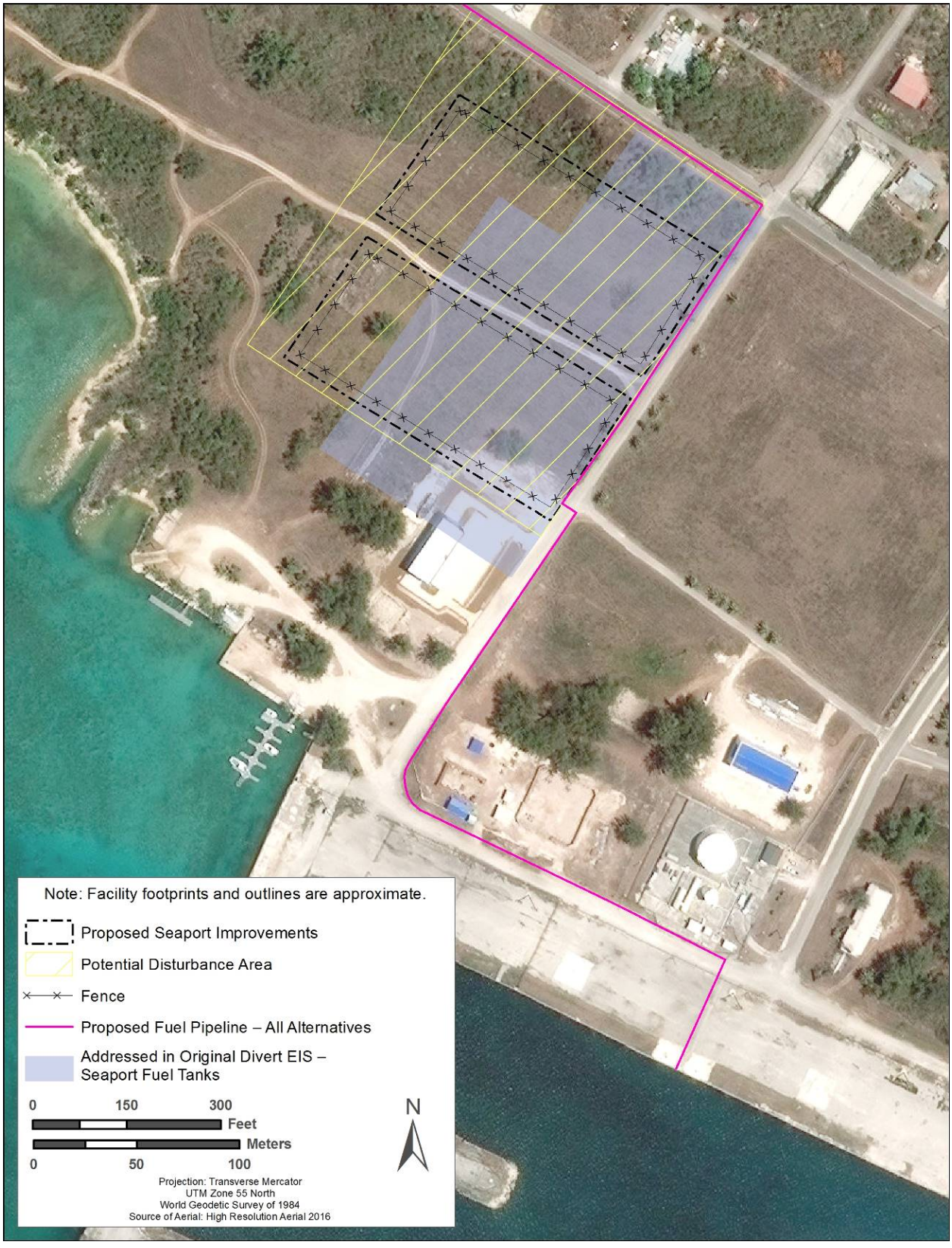

Figure 2.2-1. Proposed Support Infrastructure at the Tinian Seaport

Construction of the support infrastructure would occur concurrently with the pipeline construction over approximately 2 to 3 years. As described for the fuel pipeline operation and maintenance, USAF would follow Technical Order 37-1-1, UFC 3-460-03, and AFI 23-201 for the operation and maintenance of the support facilities.

As described for the fuel pipeline, USAF would complete the final detailed design for the support infrastructure, to include operation and maintenance planning, after issuance of the ROD for this SEIS, and completion of the geotechnical investigation. The final detailed design for the support infrastructure would comply with applicable regulations and industry standards that direct pipeline design, construction, maintenance, and operation and are outlined in **Appendix F.** These design standards and requirements provide an adequate baseline for determining impacts under NEPA in this SEIS. As noted previously in this Section and in UFC 3-460-01, Section 2-13.1, it is the firm policy of the DOD to design and construct fueling facilities in a manner that will prevent damage to the environment by accidental discharge..

Construction Materials. All materials would be transported to or produced on Tinian as described in the 2016 Divert EIS (Final EIS, Section 2.5.2). Transport of materials on Tinian to support construction of the fuel pipeline would not exceed the amount of fuel truck traffic analyzed in the 2016 Divert EIS (1,800 one-way trips); however, fuel truck traffic was included in the 2016 Divert EIS during the Divert implementation phase and transport of construction materials would occur along the pipeline route and during the construction phase (Final EIS, Section 2.5.2 and Section 4.11.2.2). Construction materials could also be transported to the site by construction workers as part of their daily commute to the construction site.

Details regarding construction worker support are provided in the ***Construction Workers*** section. Movement of construction personnel, equipment, and supplies could result in the movement and spread of invasive plant and animal species to Tinian. In order to prevent the spread of invasive species, the routing of shipments through Guam would be minimized and redundant inspection of materials that must be shipped from that island (both before they arrive on Tinian and when they arrive) would be conducted. USAF would also conduct risk analyses, develop and implement procedures, and participate in regional planning to reduce or eliminate the spread of invasive species.

Transport of construction materials to the seaport was addressed in the 2016 Divert EIS for construction of the fuel tanks (Final EIS, Section 2.5.2). Fewer volumes of construction materials would be needed for development of the seaport support infrastructure than the fuel tanks due to the smaller impervious surface footprint of the support infrastructure. Therefore, transport of construction materials to the seaport is addressed in the 2016 Divert EIS and will not be analyzed further in this SEIS.

Construction Workers and Support Personnel. USAF personnel and their contractors would be subject to applicable CNMI, DOD, and federal regulations while on or off-duty. Approximately 75 construction workers, in addition to those analyzed in the 2016 Divert EIS (Final EIS, Section 2.5.2), could be required to support construction of the pipeline during the course of the 2- to 3-year construction period. It is anticipated that the peak number of workers would only be needed during shorter duration intensive or critical construction periods. In 2016, the construction workforce of Tinian was 122 people and it is assumed that this entire workforce

would support the construction proposed in the 2016 Divert EIS. Therefore, for purposes of analysis in this SEIS, it is assumed the entire workforce to support pipeline construction would be from off-island. The impact analysis in **Section 4** assumes all construction workers would be needed during the 2- to 3-year construction period to determine the maximum effect of construction workers.

Personnel required for maintenance and operation of the pipeline and fuels infrastructure would be supported by the exercise and support personnel (e.g., security guards) analyzed in the 2016 Divert EIS (Final EIS, Section 4.14.2.2). The impact analysis in **Section 4** assumes that any additional personnel required to inspect and maintain the pipeline would be negligible (e.g., 0 to 5 personnel) and would be from on-island.

2.2.1 Pipeline and Support Infrastructure Selection of Alternatives

Identification and analysis of alternatives is one of the core elements of the environmental impact analysis process under NEPA and USAF's implementing regulations. USAF may expressly eliminate alternatives from detailed analysis based on reasonable selection standards (32 CFR § 989.8(c)). To be considered reasonable, an alternative must be suitable for decision making, capable of implementation, and able to meet the purpose of and need for the action.

USAF initially considered multiple means of fuel transport via pipeline, including use of aboveground or temporary pipelines. However, both of these pipeline types are susceptible to breaches, vandalism, sabotage, and corrosion, and do not meet the need of the Proposed Action to provide a safe, reliable, and secure means of fuel transport. Therefore, only alternatives for placement of an underground pipeline were developed, which would limit exposure to external factors such as weather and foot and vehicle traffic. Additionally, a belowground pipeline would reduce the potential for exposure to severe environmental corrosion pressure present in the Mariana Islands. To maximize efficiency in pipeline construction and fuel transfer, USAF focused consideration of pipeline routes on those that would be as direct as possible from the Tinian seaport to the airport, with minimal deviation.

The following selection standards were developed based on USAF requirements for the proposed underground pipeline and applied to possible pipeline routes to select those considered reasonable for implementing the Proposed Action. Reasonable alternatives will be carried forward for detailed analysis in the SEIS. The following selection standards are required for placement of the underground pipeline:

1. Utilize easement rights based on the 1994 *Naval Facilities Assets Database Real property Inventory; End of Year Processing and Disposal Agreement* (Common Name: 1994 Leaseback and Disposal Agreement) and the 1999 *Partial Release of Leasehold Interest between CNMI and USA* [Common Name: 1999 Partial Release of Leasehold Interest]. Formerly leased lands in the seaport area and in and around the Tinian International Airport are subject to blanket easements within these documents, which provide the federal government the right to install, operate, and maintain fuel infrastructure and other utilities.

2. Minimize disturbance within established Tinian communities and to any existing infrastructure to ensure the pipeline can be efficiently constructed, operated, and maintained.
3. Minimize pipeline route distance and road/utility crossings.

USAF identified four possible routes from the Tinian seaport to the Divert bulk receipt fuel tanks at the airport: the Runway route, West route, East route, and Broadway route. These possible alternatives were evaluated against the selection standards. The detailed evaluation of each alternative is provided in the following paragraphs and in **Table 2.2-1**, and a summary of the evaluation and selection of alternatives for analysis in the SEIS is provided in **Section 2.2.1**.

Table 2.2-1. Pipeline Route Alternatives Screened Against Selection Standards

Alternative	Selection Standards		
	Utilize Easement Rights	**Minimize Disturbance**	**Minimize Distance**
Runway Route	Entirely within lands with easement rights	Extensive disturbance to existing infrastructure; cannot be efficiently constructed or maintained	Approximately 3.70 miles
West Route	Entirely within lands with easement rights	Minimal disturbance	Approximately 4.08 miles
East Route	Entirely within lands with easement rights	Minimal disturbance	Approximately 4.94 miles
Broadway Route	Partially outside of lands with easement rights	Disturbance to the community and infrastructure	Approximately 4.16 miles

Runway Route. The Runway route travels north from the Tinian seaport until it intersects Tinian Route (TR) 26 (i.e., West Avenue) and then stays on a northwestern path by following TR26 and 6th Avenue until it reaches TR24 (i.e., 42nd Street) where it turns east (see **Figure 2.2-2** for a map of the Runway route). The route then continues east on TR24 until due south of the airport, where it turns north and continues north underneath the existing Tinian International Airport taxiway and runway to approach the Divert fuel storage tanks from the south (see **Figure 2.2-3** for the TR locations and names). This route falls entirely within lands with easement rights; however, construction of this route underneath the existing airport taxiway and runway would cause extensive disturbance to existing infrastructure and could not be efficiently constructed, operated, or maintained, as confirmed through coordination with FAA. This route is approximately 3.70 miles long.

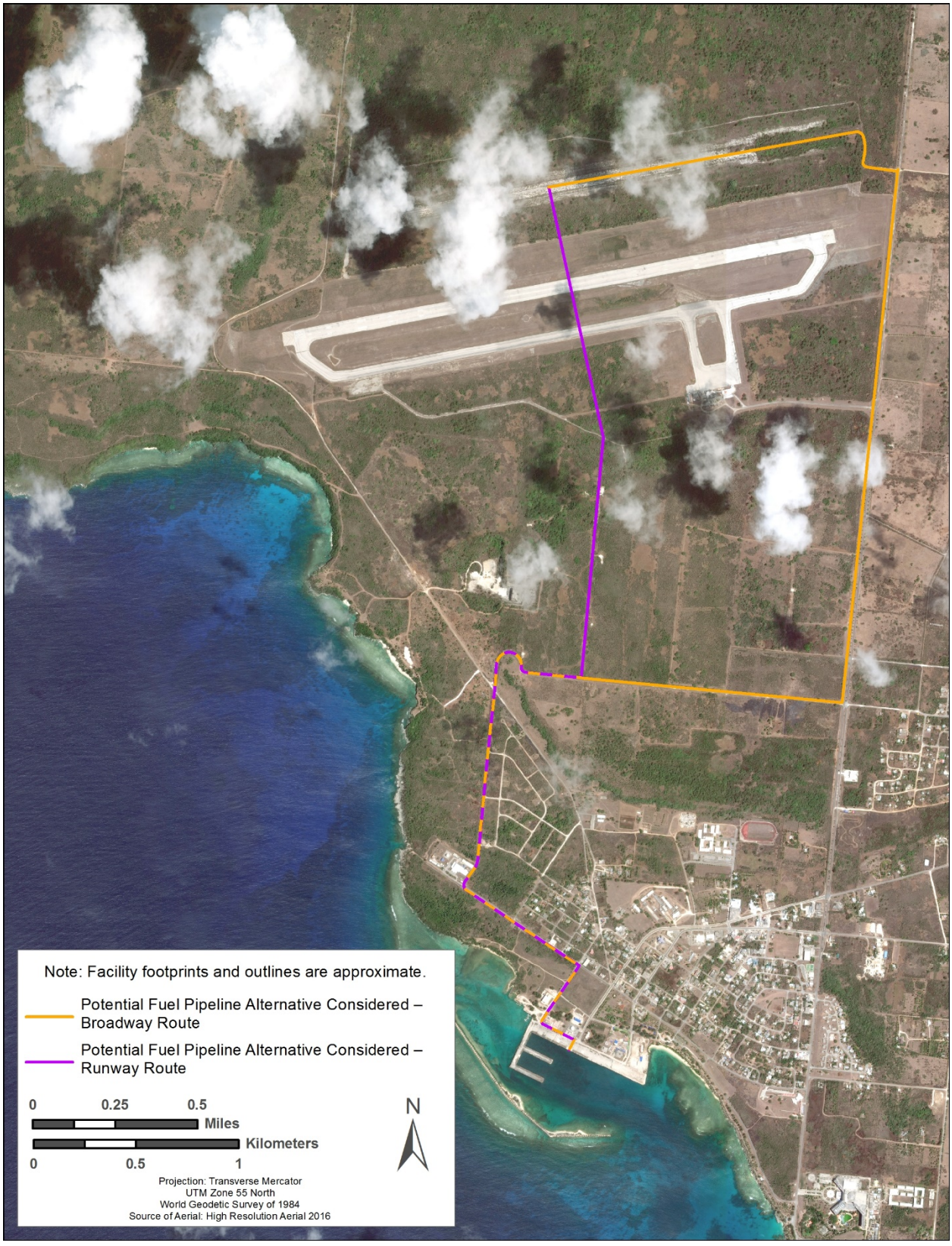

Figure 2.2-2. Runway Route and Broadway Pipeline Route Alternatives

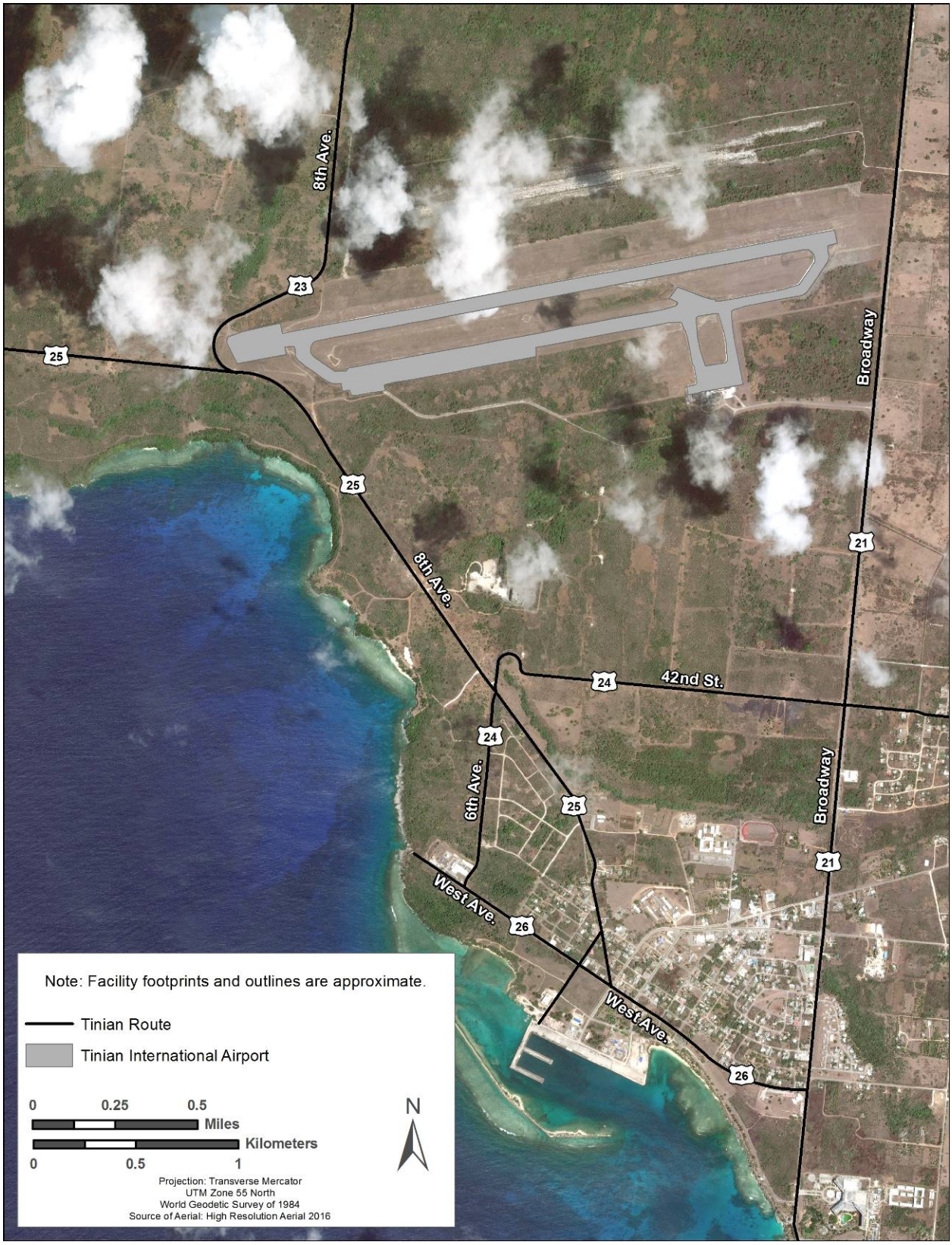

Figure 2.2-3. Roadway Map of Tinian

West Route. The West route travels north from the Tinian seaport until it intersects TR26 and then stays on a northwestern path by following TR26, 6th Avenue, and TR25 (i.e., 8th Avenue), and then turns northeast along TR23 to approach the Divert fuel storage tanks from the west side. (See **Section 2.4** for more details and **Figure 2.2-4** for a map of the West route.) This route falls entirely within lands with easement rights; does not travel extensively along any existing communities, infrastructure, or buildings; and is approximately 4.08 miles long.

East Route. The East route extends north from the Tinian seaport along the same path as the Runway route until just south of the airport runway, where it turns north towards the airport and then west and eventually reconnects with the proposed West route to approach the airport from the west (see **Section 2.4** for more details and **Figure 2.2-4** for a map of the East route.) This route falls entirely within lands with easement rights; does not travel extensively along any existing communities, infrastructure, or buildings; and is approximately 4.94 miles long.

Broadway Route. The Broadway route follows the same path as the Runway and East routes, except rather than turning north when south of the airport, it continues to travel east on TR24 until intersecting TR21 (i.e., Broadway). At TR21, this route turns north and travels alongside TR21 before turning west along an unnamed roadway to approach the Divert fuel storage tanks from the east (see **Figure 2.2-4** for a map of the Broadway route). This route partially falls outside of existing lands with easement rights and also travels along TR21, which is one of the main transportation routes on Tinian and would increase the potential to disturb the community and existing infrastructure along this route. This route is approximately 4.16 miles long.

Support Infrastructure. Based on review of the 2016 Divert EIS and consideration of technical and siting factors, USAF determined that the proposed support infrastructure should be sited in the location originally proposed for the bulk fuel storage facilities at the seaport (Final EIS, Section 2.5.2). The original site proposed for construction of the bulk fuel tanks was chosen for the following reasons:

- The original site was analyzed in the 2016 Divert EIS for construction and significant impacts were not identified (Final EIS, Section 4).
- The original site is co-located with the Divert biosecurity facility and laydown yard, condensing the total land that would be required for these facilities.
- The original site is within proximity to the seaport fuel off-load header, allowing efficient transfer of the fuel from the fuel off-load header to the pump house.

Therefore, no other site alternatives were identified or considered for construction of the support infrastructure at the seaport. The proposed support infrastructure would be constructed in the location presented in **Figure 2.2-1**, regardless of the pipeline route alternative proposed for construction.

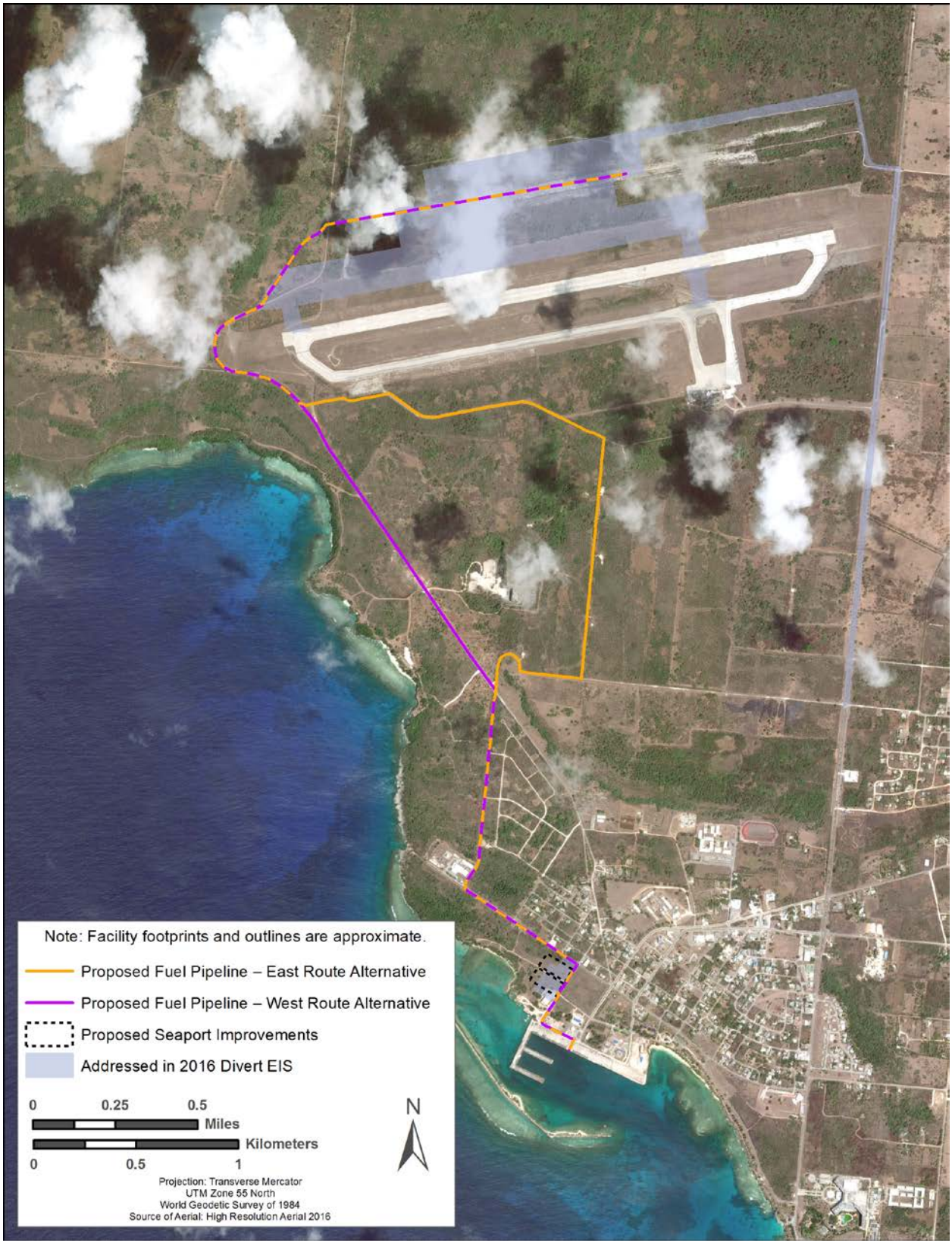

Figure 2.2-4. Proposed West and East Pipeline Route Alternatives

2.2.2 Pipeline and Support Infrastructure Alternatives Carried Forward for Analysis

As described in **Section 2.2.1**, USAF evaluated four possible pipeline routes in comparison to the selection standards identified for this Proposed Action. Only two of the pipeline routes, the West route and East route, have the ability to meet each selection standard. The Runway route has been dismissed from further analysis because it does not minimize disturbance to existing infrastructure and could not be efficiently constructed, operated, or maintained because of its routing underneath the taxiway and runway. The Broadway route has been dismissed from further analysis because it does not fall entirely within lands with easement rights or minimize disturbance to existing infrastructure and the Tinian community.

Accordingly, the West route and East route shown in **Figure 2.2-4** will be carried forward for analysis in the SEIS. Both the West route and East route would be constructed and operated as described in the introduction of **Section 2.2** and would include construction of the support infrastructure shown in **Figure 2.2-1**. The exact location and length of either pipeline route and size of the support infrastructure could shift, within the constraints of the environmental effects analysis presented in **Section 4**, based on engineering, environmental, or design limiting factors; input from CNMI agencies; negotiations with property owners; or potential changes requested by FAA for pipeline construction at the airport.

2.2.3 Pipeline and Support Infrastructure No Action Alternative

Section 1502.14(d) of NEPA requires the analysis of a No Action Alternative, which provides a benchmark, enabling decision makers to compare the magnitude of the environmental effects to a proposed action and alternatives. No action means that an action would not take place and the resulting environmental effects from taking no action would be compared with the effects of allowing the proposed activity to go forward. Under the No Action Alternative, USAF would not construct and operate the proposed fuel pipeline and support infrastructure described in **Section 2.2**. Under this alternative, Divert activities and exercises at Tinian International Airport (North) would be dependent on fuel trucks to transport fuel from the Tinian seaport to Tinian International Airport and fuel tanks would be constructed and operated at the seaport, as was analyzed in the 2016 Divert EIS and later selected in the ROD (Final EIS, Section 2.5.2). The No Action Alternative would increase fuel resupply time and increase for the risk of environmental impacts from potential fuel spills from trucks during loading, driving, and offloading (Strata 2017).

2.3 Roadway Improvements

USAF proposes to improve, as needed, certain existing roadways previously analyzed for Divert vehicles in the 2016 Divert EIS (Final EIS, Section 2.5.2) that would support construction of all Divert facilities and, if needed, transfer of fuel via tanker truck. Roadway improvements have standalone value for supporting the Divert project and would occur independently of the decision to construct the pipeline and support infrastructure described in **Section 2.2**.

The road improvements would include replacement of the existing roadway surfaces, which would entail removing the existing deteriorated asphalt cap, which is up to 2 to 4 inches thick;

grading the road subsurface down approximately 8 inches below the original asphalt cap; laying an up to 8-inch sub base; and finishing the surface with a 3-inch asphalt cap. Asphalt removed from the deteriorated cap would be reused as road improvement material or recycled on Tinian to the extent feasible. All roadway improvements would occur within the existing roadbeds and shoulders, and no roadbed widening or ROW alterations would occur. Road improvements would be constructed in accordance with UFC 3-250-18FA *General Provisions and Geometric Designs for Roads, Streets, Walks, and Open Storage Areas* and UFC 3-250-01 *Pavement Design for Roads and Parking Areas*, as feasible.

Road improvements would be executed by either USAF or the Defense Access Roads program and could take place prior to, during, or as repairs after construction of the Divert infrastructure identified in the 2016 Divert EIS (Final EIS, Section 2.5.2); however, road improvements are not anticipated to exceed 1 year of total construction time.

The impacts analysis in this SEIS assumes that all roadways proposed for improvements would be reconstructed with a new sub base and asphalt cap; however, portions of these roadways may require less extensive repairs based on geotechnical analysis. Additionally, lesser maintenance and repair of any road proposed for Divert, including TR21, could occur, as considered in the 2016 Divert EIS (Final EIS, Section 4.11.2).

2.3.1 Roadway Selection of Alternatives

USAF determined that any road proposed for improvements should meet the following selection standards:

- Be a route that was proposed for Divert traffic in the 2016 Divert EIS (either for construction vehicles or fuel trucks) (Final EIS, Section 2.5.2).
- Be a route in need of extensive improvement and reconstruction to better support Divert activities and minimize impacts to community transportation.

2016 Divert EIS Construction Route. USAF conducted an engineering site visit to Tinian to examine the roadways proposed for Divert traffic in the 2016 Divert EIS (Final EIS, Section 2.5.2). The route proposed for construction traffic in the 2016 Divert EIS travels from the Tinian seaport and to the southeast directly to TR21, and then along TR21. TR21 is one of the main roadways on Tinian with an average daily traffic volume of approximately 390–1,470 vehicles. The engineering site visit indicated that TR21 is classified as “fair” with good drainage. Shoulder improvements and roadway surface repairs could be required on TR21; however, extensive roadway improvement and replacement would not be required.

2016 Divert EIS Fuel Truck Route. The route proposed for fuel trucks in the 2016 Divert EIS (Final EIS, Section 2.5.2) travels from the Tinian seaport north to TR25, north along TR25 to its intersection with TR24, east along TR24 to its intersection with TR21, and finally north along TR21. As described in the introduction of **Section 2.3**, the roadway improvements would be independent from the proposal to construct the pipeline and support infrastructure. If the pipeline is not constructed, this route would be utilized by fuel vehicles as described in the 2016 Divert EIS (Final EIS, Section 2.5.2). Construction of the pipeline would eliminate the need for fuel transfer by vehicle; therefore, if the pipeline is constructed, USAF would utilize this route for

all Divert construction vehicles rather than fuel vehicles. The engineering site visit indicated that a portion of the fuel truck route analyzed in the 2016 Divert EIS, from the seaport to TR21, is classified as poor/failing paved surfaces with potholes and uneven surfaces. The pavement of this route is deteriorating and cracked, and there are low spots in the pavement surfaces that retain water. Therefore, extensive roadway improvement and replacement along this route would be required.

2.3.2 Roadway Alternatives Carried Forward for Analysis

As described in **Section 2.3.1**, USAF evaluated possible roads for improvement in comparison to the selection standards identified for this Proposed Action. Only one segment of roadway meets the selection standards. The construction traffic route analyzed in the 2016 Divert EIS (Final EIS, Section 2.5.2) has been dismissed from further analysis because it does not meet the selection standard for requiring extensive improvement and reconstruction. Accordingly, only the fuel truck route analyzed in the 2016 Divert EIS (Final EIS, Section 2.5.2), excluding TR21, will be carried forward for analysis in the SEIS for road improvements and is shown in **Figure 2.3-1**. However, as described in **Section 2.3**, lesser maintenance and repair of any road proposed for Divert use, including TR21, could still occur as considered in the 2016 Divert EIS (Final EIS, Section 4.11.2).

As stated in **Section 2.3.1**, the route proposed for roadway improvements could be utilized for Divert construction traffic if fuel trucks were not needed due to construction of the pipeline. Use of this route for fuel or construction vehicles would not exceed the amount of fuel truck traffic analyzed in the 2016 Divert EIS (Final EIS, Section 2.5.2). The roadway improvements would take place over 2.51 miles and would be constructed as described in **Section 2.3**.

Construction Materials. To construct the proposed road improvements, construction materials such as road base and asphalt would be needed along the entirety of the road proposed for improvements. All materials, excluding reused materials from asphalt removal, would be transported to or produced on Tinian as described in the 2016 Divert EIS (Final EIS, Section 2.5.2). Materials would be transferred from the seaport along the same route that was proposed for fuel trucks in the 2016 Divert EIS (Final EIS, Section 2.5.2). However, 1,178 construction truck trips, in addition to those analyzed in the 2016 Divert EIS (Final EIS, Section 2.5.2), would be needed for the road improvements, which equates to approximately 3 roundtrips per day by dump trucks over the course of 1 year.

Construction Workers. USAF personnel and their contractors would be subject to applicable CNMI, DOD, and federal regulations while on- or off-duty. Approximately 25 construction workers, in addition to those analyzed in the 2016 Divert EIS (Final EIS, Section 2.5.2), could be required to support construction of the road improvements. It is anticipated that the peak number of workers would only be needed during shorter duration intensive or critical construction periods. In 2016, the construction workforce of Tinian was 122 people and it is assumed that this entire workforce would support the construction proposed in the 2016 Divert EIS. Therefore, it is assumed the entire workforce to support the road improvements would be from off-island. The impact analysis in **Section 4** assumes all construction workers would be needed during the construction period to determine the maximum effect of construction workers.

Figure 2.3-1. Proposed Roadway Improvements

2.3.3 Roadway No Action Alternative

Under the No Action Alternative, the proposed roadway improvements would not be constructed. Under this alternative, only minor roadway repairs along the construction and fuel truck routes would occur, as was considered in the 2016 Divert EIS (Final EIS, Section 4.11.2). The No Action Alternative would cause the continued deterioration of the Tinian roadways proposed in the 2016 Divert EIS for Divert fuel trucks (Final EIS, Section 2.5.2).

2.4 Summary of Proposed Actions and Alternatives

In summary, USAF proposes to accomplish the following actions:

- Construct and operate a fuel pipeline from the Tinian seaport to Tinian International Airport along either the West route or the East route. In support of the pipeline, construct and operate infrastructure at the Tinian seaport, to include a booster pump house and associated fire protection systems, a boom storage building, and necessary utility connections.
- Improve the roadway along the fuel truck route that was analyzed in the 2016 Divert EIS (Final EIS, Section 2.5.2), excluding TR21. If the pipeline is not constructed, this route would be used by fuel truck traffic as analyzed in the 2016 Divert EIS (Final EIS, Section 2.5.2). If the pipeline is constructed, this route would be utilized to support construction of all Divert-related projects.

The Proposed Actions and alternatives are shown in **Figure 2.4-1.**

2.5 Identification of Preferred Alternatives

According to CEQ guidelines, an agency's preferred alternative is the alternative that the agency believes would fulfill its statutory mission and responsibilities, giving consideration to economic, environmental, technical, and other factors. CEQ regulations require the section of the SEIS on alternatives to "identify the agency's preferred alternative if one or more exists, in the draft statement, and identify such alternative in the final statement…" (CEQ 1981).

USAF's Preferred Alternative for the fuel pipeline and support infrastructure is the East route alternative, as described in **Section 2.2.2.** The East route was identified as the Preferred Alternative because the West route is partially encumbered by a long-term land lease by a private entity. The analysis of impacts for the fuel pipeline and support infrastructure also includes the West route as described in **Section 2.2.2**, and the No Action Alternative as described in **Section 2.2.3**.

USAF's Preferred Alternative for the roadway improvements is the Proposed Action, as described in **Section 2.3.2**. The roadway improvements Proposed Action was identified as the Preferred Alternative because of the mutual benefit it provides to USAF and Tinian by improving the level of service on roadways to be utilized by both entities.

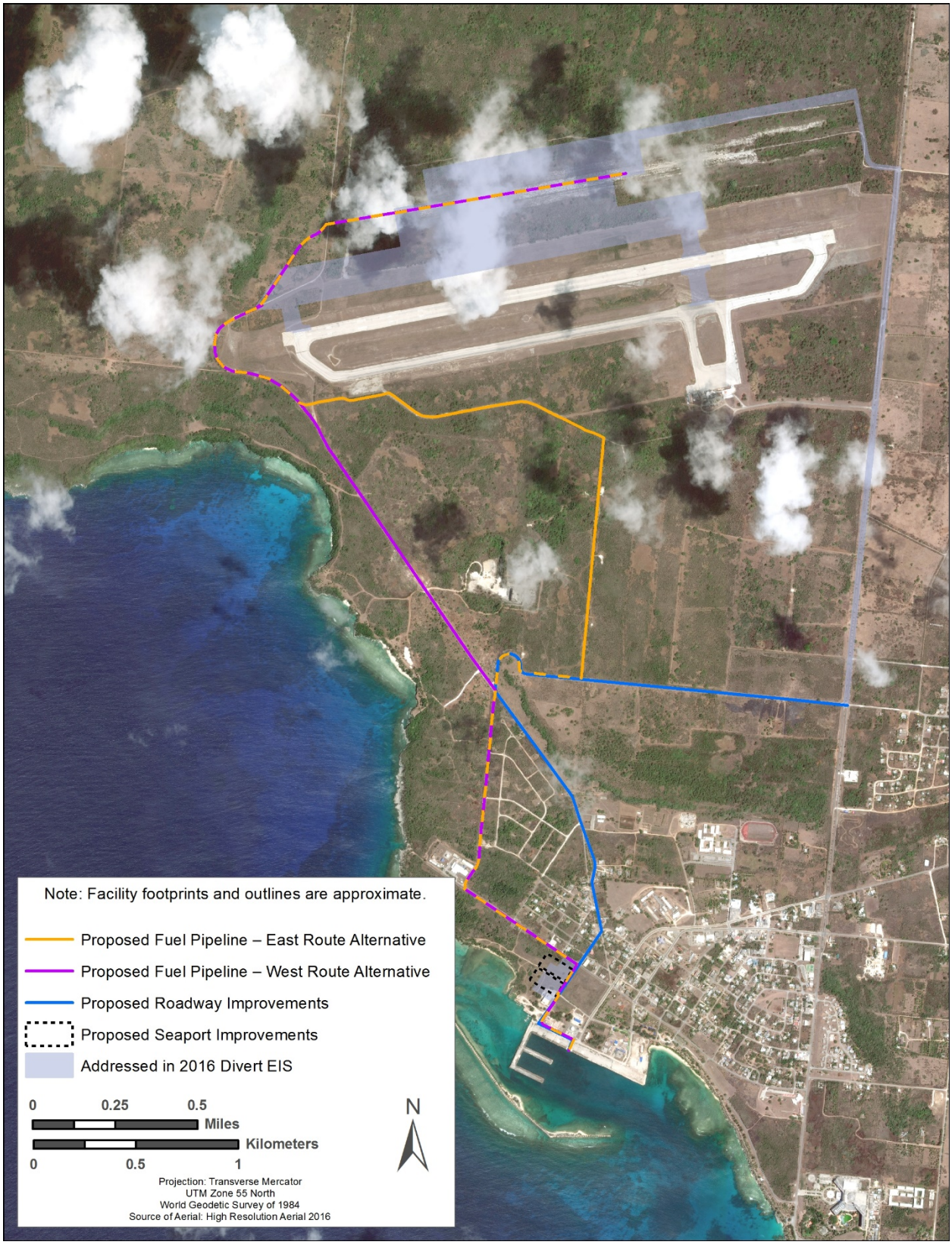

Figure 2.4-1. Summary of Proposed Actions and Alternatives

USAF is identifying the Preferred Alternatives pursuant to 40 CFR § 1502.14(e); however, no final decisions selecting particular alternatives for implementation have been made. The USAF decision maker will use the SEIS to support the decisions about how best to satisfy the stated purposes and needs within mission constraints. The final decisions will be documented in the ROD.

2.6 Summary of Environmental Impacts and Mitigation Measures

NEPA requires focused analysis on environmental resources and topics potentially affected by the Proposed Actions. Environmental impacts that could result from implementing USAF's Pipeline and Support Infrastructure Proposed Action alternatives and the No Action Alternative are summarized in **Table 2.6-1**. Environmental impacts that could result from implementing USAF's Roadway Improvements Proposed Action and No Action Alternative are summarized in **Table 2.6-2**. These tables present potential adverse impacts that could occur, unless otherwise noted as beneficial impacts, and include consideration of compliance with federal and local regulations and requirements. Potential impacts are also based on consultations with federal and CNMI agencies responsible for ensuring compliance with resource-specific regulations; for example, Section 106 consultation with CNMI SHPO and Section 7 consultation with USFWS. Detailed descriptions of the existing environmental conditions and environmental consequences for resources potentially affected by the Proposed Actions and alternatives are provided in **Sections 3** and **4**, respectively.

Mitigation measures avoid, minimize, remediate, or compensate for environmental impacts. CEQ regulations (40 CFR § 1508.20) define mitigation to include the following:

1. Avoid the impact altogether by not taking a certain action or parts of an action.
2. Minimize impacts by limiting the degree or magnitude of the action, and its implementation.
3. Rectify the impact by repairing, rehabilitating, or restoring the affected environment.
4. Reduce or eliminate the impact over time by preservation and maintenance operations during the life of the action.
5. Compensate for the impact by replacing or providing substitute resources or environments.

Avoiding, minimizing, or reducing potential impacts has been a priority guiding the Proposed Actions in this SEIS. Mitigation measures for implementing the Proposed Actions and avoiding, minimizing, remediating, or compensating for potential impacts on specific resource areas have been identified and would be implemented as required, as shown in **Tables 2.6-1** and **2.6-2**, **Section 4**, and **Appendix F**. Mitigation measures detailed in **Tables 2.6-1** and **2.6-2** are those that have been developed to specifically address the impacts anticipated from the Proposed Actions and are also based on consultations with federal and CNMI agencies. **Tables 2.6-1** and **2.6-2** also summarize mitigations measures that are routine or standard compliance actions dictated by federal, DOD, USAF, or CNMI regulations and are built into the design, construction, and operation of the proposed infrastructure for USAF fuel facilities and roadways. **Appendix F**

provides detailed information on compliance actions and industry standard mitigation measures by the resource area and Proposed Action for which they would be implemented.

Following the ROD, a Mitigation Plan will be prepared in accordance with 32 CFR § 989.22(d). The Mitigation Plan will address specific mitigations identified and agreed to during the EIAP. The Mitigation Plan will identify principal and subordinate organizations having responsibility for oversight and execution of specific mitigation and management actions. The plan will be prepared in accordance with the CEQ mitigation and monitoring guidance.

Table 2.6-1. Summary of Pipeline and Support Infrastructure Environmental Impacts and Mitigation Measures

West Route Alternative	East Route Alternative	No Action Alternative	West Route Mitigation Measures	East Route Mitigation Measures
Noise				
Short-term, minor to moderate impacts would be expected from construction noise. Impacts are not expected from operation, once construction is complete.		Construction noise levels and impacts would be similar to those presented for the Proposed Action. Noise impacts associated with fuel truck trips under the No Action Alternative would be short term and moderate on receptors adjacent to the roadways.	USAF would utilize available technology to reduce noise from construction equipment and restrict construction operating hours. **Appendix F** provides further details on noise compliance actions and industry standard mitigation measures.	
Biological Resources				
Terrestrial Resources. Short- and long-term, minor, direct impacts are expected on vegetation and wildlife, respectively. Adverse impacts are not expected on special status terrestrial species. *Marine Biological Resources*. Short-term, no to minor, indirect impacts would be expected on nearshore marine resources, Essential Fish Habitat (EFH), and special status marine species during construction. Long-term, negligible, indirect impacts would be expected on nearshore marine resources, EFH, and special status marine species during operation.		*Terrestrial Resources.* Under the No Action Alternative, no vegetation along pipeline routes would be disturbed and there would be no loss of or disturbance of wildlife habitat along a pipeline route; impacts on vegetation and wildlife would be less than under the Proposed Action. *Marine Biological Resources*. While impacts on marine species could be expected because potential fuel spills from trucks are more common than from pipelines (Strata 2017); impacts are anticipated to be negligible.	• Two individual Fadang, a cycad, have been planted within the landscaping of the Nanyo Kohatsu Kabushiki Kaisha Administration Building and Laboratory, along TR26 near the southern terminus of the West and East routes. These plants and the surrounding memorial would be avoided during construction of the pipeline. • USAF would implement all measures described in the 2012 Biological Opinion of Divert Capabilities and Conducting Divert Activities and Exercises, Saipan and Tinian, Commonwealth of the Northern Mariana Islands (01EPIF00-2012-F-0445) and in the 2015 USFWS Amendment to the Biological Opinion to prevent the spread of brown tree snakes and other invasive species. • To avoid harming nesting birds, surveys or monitoring during construction would be conducted and areas where active nests are found would be avoided, or other measures would be taken to avoid harming any migratory birds, nests, or eggs. • As outlined in **Appendix F**, USAF would adhere to federal and CNMI requirements and design standards for water quality, stormwater management, and erosion and sediment control to minimize and prevent impacts on nearshore waters.	

West Route Alternative	East Route Alternative	No Action Alternative	West Route Mitigation Measures	East Route Mitigation Measures
Cultural Resources				
Ground disturbance during construction of the pipeline would have potential to affect the physical integrity of historic properties, having minor to major impacts on the sites. Construction would also have short-term, minor to moderate impacts on the historic setting or feeling of the properties. Impacts from operation of the pipeline are not expected. As part of the Section 106 process, USAF determined the Undertaking would contribute to adverse effects from the Divert Activities and Exercises undertaking.		Construction of the fuel tanks and fuel truck traffic under the No Action Alternative would have no impact on cultural resources.	In accordance with the 2020 Amendment to the 2016 Programmatic Agreement (PA): • USAF would follow all aspects of the 2016 PA that are not the subject of the Amendment. • USAF would complete development of an Interpretive Plan to document and interpret the prehistory and history of the Divert Activities and Exercises Area of Potential Effect (APE), including the area affected by the Tinian Divert Infrastructure Improvements project, for the public. • USAF would assess the feasibility and effectiveness of conducting a geophysical survey for detecting subsurface anomalies that may represent buried archaeological features or human remains, and enabling avoidance of such anomalies. If the geophysical survey is determined to be feasible and effective, USAF would develop and implement a Geophysical Survey Work Plan, and, to the extent practical, adjust the routing of the fuel pipeline to avoid anomalies identified in the geophysical survey. • USAF would coordinate identification of subsurface historic properties with clearance of munitions and explosives of concern in areas within the APE identified as having moderate to high potential for buried archaeological deposits. • USAF would design the pipeline to avoid site TN-4-1010. • USAF would avoid site HDR-18-07 or conduct data recovery of the site. • USAF would, to the extent practical, minimize the use of steel-tracked equipment on intact airfield pavements and repair airport pavements affected by fuel pipeline construction.	

<table>
<tr><th>West Route Alternative</th><th>East Route Alternative</th><th>No Action Alternative</th><th>West Route Mitigation Measures</th><th>East Route Mitigation Measures</th></tr>
<tr><td colspan="5">Socioeconomics</td></tr>
<tr><td colspan="2">Short-term, minor to moderate impacts on the Tinian population, housing, public services, and sociocultural issues would result from construction; however, direct, beneficial impacts on the local economy would be expected. None to negligible beneficial long-term impacts on socioeconomics would occur during operation of the pipeline or seaport infrastructure.</td><td>The No Action Alternative would have no impacts on existing socioeconomic conditions. Beneficial impacts would be expected from operation of the fuel trucks and vehicle fuel purchases. Demand for public services and changes in sociocultural issues would not change from existing conditions.</td><td colspan="2">• USAF personnel and their contractors would coordinate with local hotels to secure the required number of hotel rooms prior to proposed use to minimize impacts and avoid supply issues.
• To minimize the impacts on the Tinian Health Center, the construction contractor would be responsible for medical care for construction personnel.
• Additional security and fire personnel could be required to rectify the increased demand due to an increase in island population during construction.</td></tr>
<tr><td colspan="5">Environmental Justice and Protection of Children</td></tr>
<tr><td colspan="2">Construction and operation of the pipeline infrastructure would not result in significant and disproportionately high and adverse health or environmental impacts on minority, low-income, elderly, or children populations on Tinian. Although adverse impacts would occur, the impacts would be less than significant.</td><td>Construction impacts under the No Action Alternative would be reduced in comparison to the Proposed Action. However, operation under the No Action Alternative would have long-term, periodic, negligible impacts on environmental justice populations due to the use of fuel trucks.</td><td colspan="2">USAF would adhere to federal and CNMI requirements and design standards that would reduce impacts on minority, low-income, elderly, or children populations in the unlikely event of a fuel spill. Appendix F provides further details on compliance actions and industry standard mitigation measures for stormwater and fuels management.</td></tr>
<tr><td colspan="5">Health and Safety</td></tr>
<tr><td>Short-term, direct, negligible impacts on explosives safety and public health and safety could occur.</td><td>Impacts on explosives safety and public health and safety during operations would be minor and similar to, but slightly greater than, those described for the West route.</td><td rowspan="2">Lesser impacts on construction personnel health and safety and explosives safety under the No Action Alternative in comparison to the Proposed Action because a lesser degree of construction would be required. Greater impacts on the health and safety of operational personnel and the public would be expected from the increased potential for spills, leaks, or other hazardous risks because such issues with trucks are more common than with pipelines.</td><td colspan="2" rowspan="2">USAF and their contractors would adhere to established federal and CNMI safety regulations and industry standard safety protocols to minimize impacts on construction worker safety and public safety. Appendix F provides further details on health and safety compliance actions and industry standard mitigation measures.</td></tr>
<tr><td colspan="2">Short- and long-term, direct, minor impacts on contractor health and safety and airfield safety during construction and operations. Short-term, direct, negligible impacts on public safety during construction.</td></tr>
</table>

West Route Alternative	East Route Alternative	No Action Alternative	West Route Mitigation Measures	East Route Mitigation Measures
Soils and Geology				
Long-term, negligible to moderate impacts on physiography and topography from construction. Short- and long-term, minor to moderate impacts on soils from construction and operation. Long-term, minor to moderate impacts from geologic hazards during pipeline installation and operation.	Impacts on regional geology, physiography, topography, and soils would be greater than those described for the West route, but not significant. Impacts from geologic hazards would be slightly less than those described for the West route.	Lesser impacts on regional geology, physiography and topography, and soils, and from geologic hazards under the No Action Alternative in comparison to the Proposed Action. Greater impacts on soils within the seaport project area and from potential fuel contamination.	• Prior to finalizing the design for and constructing the fuel pipeline, USAF would conduct a geotechnical investigation along the pipeline route to classify the subsurface composition and identify the presence of any faults. Results of the geotechnical investigation would be incorporated into the final pipeline design, which would adhere to specifications in American Society of Mechanical Engineers Standard B31.3 *Process Piping* and B31.4 *Transportation Systems for Liquids and Slurries*. • USAF would design facilities to adhere to federal and CNMI requirements and design standards for erosion and sediment control, spill prevention, and geologic hazards. • USAF would implement erosion and sediment control measures and spill prevention measures for facilities post-construction. • **Appendix F** provides further details on soils and geology compliance actions and industry standard mitigation measures.	
Water				
Short- and long-term, minor to moderate impacts on groundwater resources and surface and coastal water resources.		Increased impacts under the No Action Alternative in comparison to the Proposed Action due to increased potential for spills and larger area of impervious surfaces. Stormwater runoff volumes could be increased under this scenario.	• USAF would design facilities to adhere to federal and CNMI requirements and design standards for water quality and stormwater management. • USAF would implement stormwater management and monitoring methods to ensure water quality before and after construction. • **Appendix F** provides further details on water compliance actions and industry standard mitigation measures.	
Infrastructure and Transportation				
Short-term, minor to moderate impacts on the water supply. Short-term, minor impacts on solid waste and local transportation.	Short-term, moderate impacts on the water supply. Short-term, minor to moderate impacts on solid waste and local transportation.	Under the No Action Alternative, lesser impacts would be expected on the water supply than under the Proposed Action; however, greater impacts on solid waste and transportation would be expected.	• USAF wells proposed in the 2016 Divert EIS (Final EIS, Section 4.13.2.1) would be designed to incorporate the need for water requirements for the proposed pipeline and support infrastructure. USAF would manage draw rates from the existing and proposed wells to ensure that water supply is not exceeded.	

West Route Alternative	East Route Alternative	No Action Alternative	West Route Mitigation Measures	East Route Mitigation Measures
Short-term, negligible impacts on the airfield, seaport, electrical system, and liquid fuel supply. Beneficial impacts would occur from jet fuel receipt and transfer capabilities. Short-term, minor, impacts on stormwater.			• USAF would coordinate with Commonwealth Utilities Corporation (CUC) to manage withdraw rates from the municpal water system during fill of the seaport fire suppression water tanks to ensure that water supply is not exceeded. If coordination with CUC deems use of the municipal system is not feasible for the initial fill of the tanks, USAF would utilize water from the two proposed USAF wells at the airport. • USAF would implement measures to manage construction debris and promote energy efficiency as outlined in **Appendix F**.	
Land Use and Recreation				
Short-term, minor to moderate impacts on land ownership and recreation. Short- and long- term, minor to moderate impacts on land use. Proposed infrastructure could affect coastal uses and resources that are subject to CZMA federal consistency requirements.		Use of fuel trucks would generate long-term, periodic, negligible impacts on recreation.	USAF would obtain a CNMI major siting permit.	
Hazardous Materials and Wastes				
Short-term, minor impacts would occur from the use of hazardous materials and petroleum products and the generation of hazardous wastes. Long-term, negligible impacts would occur from operation of the proposed fuel pipeline in the event of a release.		Long-term, negligible to minor impacts on hazardous materials and wastes would occur under the No Action Alternative.	The pipeline would be routed down the center of the Tinian dump access road until the pipeline is clear of the dump for at least 500 feet, and would be clearly marked in this area.	No additional mitigation measures for the East route for hazardous materials and wastes have been identified.
			• USAF would design, manage, operate, and construct fuel infrastructure to adhere to federal and CNMI requirements and industry standards. • USAF would implement spill prevention and control, hazardous material handling, and environmental contamination protocols. • **Appendix F** provides further details on hazardous materials and wastes compliance actions and industry standard mitigation measures.	
Air Quality				
Short- and long-term, direct, negligible to minor impacts would be expected from construction emissions, land disturbance, and use of emergency generators.		Impacts on air quality would be minor and, depending on the air pollutant, would be greater or less than emissions under the Proposed Action.	USAF would implement fugitive dust control measures and obtain necessary air permits. **Appendix F** provides further details on air quality compliance actions and industry standard mitigation measures.	

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Table 2.6-2. Summary of Road Improvements Environmental Impacts and Mitigation Measures

Road Improvements	No Action Alternative	Mitigation Measures
Noise		
Noise impacts on San Jose residential areas would be short-term and moderate for individual residences located nearest the proposed road improvement segments of TR25 and TR26.	Noise level increases associated with minor road repairs would be short-term and minor.	USAF would utilize available technology to reduce noise from construction equipment and restrict construction operating hours. **Appendix F** provides further details on noise compliance actions and industry standard mitigation measures.
Biological Resources		
Terrestrial Resources. Negligible, short-term, direct impacts would be expected on native vegetation and wildlife. No adverse impacts on special status terrestrial species. *Marine Biological Resources.* Short-term, no to negligible, indirect impacts would be expected on nearshore marine resources, EFH, and special status marine species during roadway improvements.	Under the No Action Alternative, minor roadway repairs associated with routine use would have no impact on terrestrial or marine biological resources.	• USAF would implement all measures described in the 2012 Biological Opinion of Divert Capabilities and Conducting Divert Activities and Exercises, Saipan and Tinian, Commonwealth of the Northern Mariana Islands (01EPIF00-2012-F-0445) and in the 2015 USFWS Amendment to the Biological Opinion to prevent the spread of brown tree snakes and other invasive species. • As outlined in **Appendix F**, USAF would adhere to federal and CNMI requirements and design standards for water quality, stormwater management, and erosion and sediment control to minimize and prevent impacts on nearshore waters.
Cultural Resources		
Roadway improvements would have potential to impact cultural resources during excavation and ground disturbance within the roadway and limited surface disturbance from foot and vehicle traffic within 5 feet of the roadway. However, cultural resources surveys in proposed road improvement areas did not identify any historic properties.	Minor roadway repairs would have no impact on cultural resources.	In accordance with the 2020 Amendment to the 2016 PA: • USAF would follow all aspects of the 2016 PA that are not the subject of the Amendment. • Although the roadway improvements would have no impacts on historic properties, these areas were defined in the Section 106 process as part of the Divert Activities and Exercises APE and therefore would be included in USAF's development of an Interpretive Plan to document and interpret the prehistory and history of the Divert Activities and Exercises APE for the public.

Road Improvements	No Action Alternative	Mitigation Measures
Socioeconomics		
Short-term, minor to moderate impacts on the Tinian population, housing, public services, and sociocultural issues would result from construction; however, direct, beneficial impacts on the local economy would be expected.	The No Action Alternative would have no impacts on existing socioeconomic conditions but would result in fewer beneficial impacts on the local economy than the Proposed Acton. Demand for public services and changes in sociocultural issues would not change from existing conditions.	• USAF personnel and their contractors would coordinate with local hotels to secure the required number of hotel rooms prior to proposed use to minimize impacts and avoid supply issues. • To minimize the impacts on the Tinian Health Center, the construction contractor would be responsible for medical care for construction personnel. • Additional security and fire personnel could be required to rectify the increased demand due to an increase in island population during construction.
Environmental Justice and Protection of Children		
Construction of roadway improvements would not result in significant and disproportionately high and adverse health or environmental impacts on minority, low-income, elderly, or children populations on Tinian. Although impacts would occur, the impacts would be less than significant.	The No Action Alternative would require minimal construction along the routes and, therefore, fewer impacts on minority and low income populations with no impact to environmental justice.	No mitigation measures for environmental justice and protection of children have been identified.
Health and Safety		
Short-term, direct, negligible to minor impacts on contractor health and safety, explosives safety, and public safety could occur.	Impacts on contractor health and safety, explosives safety, and public health and safety would be less under the No Action Alternative. Long-term, direct, minor impacts on public health and safety would be expected from continued use of degraded roadways.	USAF and their contractors would adhere to established federal and CNMI safety regulations and industry standard safety protocols to minimize impacts on construction worker safety and public safety. **Appendix F** provides further details on health and safety compliance actions and industry standard mitigation measures.
Soils and Geology		
Long-term, negligible impacts on regional geology, physiography, and topography. Short-term, minor impacts on soils. Long-term, direct, minor to moderate impacts from geologic hazards.	Lesser impacts under the No Action Alternative on regional geology, physiography and topography, and soils, and less susceptibility to geologic hazards due to reduced ground disturbance.	• USAF would design facilities to adhere to federal and CNMI requirements and design standards for erosion and sediment control, spill prevention, and geologic hazards. • USAF would implement erosion and sediment control measures and spill prevention measures for facilities post-construction. • **Appendix F** provides further details on soils and geology compliance actions and industry standard mitigation measures.

Road Improvements	No Action Alternative	Mitigation Measures
Water		
Short-term, negligible to minor impacts on groundwater and surface water.	Under the No Action Alternative, there would be an increase in the potential for accidental spills or leaks of fuels during transport on roads that have had only minor repairs.	• USAF would design facilities to adhere to federal and CNMI requirements and design standards for water quality and stormwater management. • USAF would implement stormwater management and monitoring methods to ensure water quality before and after construction. • **Appendix F** provides further details on water compliance actions and industry standard mitigation measures.
Infrastructure and Transportation		
Short-term, negligible impacts on the seaport and liquid fuel supply. Long-term, minor, beneficial impacts on the seaport. Short-term, minor impacts on solid waste and transportation. Long-term, minor to moderate, beneficial impacts on the transportation network.	Under the No Action Alternative, lesser impacts would be expected on the water supply and solid waste than under the Proposed Action; however, greater short- and long-term impacts on the transportation network would be expected.	• USAF wells proposed in the 2016 Divert EIS (Final EIS, Section 4.13.2.1) would be designed to incorporate the need for water under the proposed roadway improvements construction. USAF would manage draw rates from the existing and proposed wells to ensure that water supply is not exceeded. • USAF would implement measures to manage construction debris as outlined in **Appendix F**.
Land Use and Recreation		
Short-term, negligible to minor impacts on land use and recreation. Proposed infrastructure could affect coastal uses and resources that are subject to CZMA federal consistency requirements.	Short- and long-term, periodic, negligible impacts on land use and recreation due to continuous need for road repairs.	USAF would obtain a CNMI major siting permit.
Hazardous Materials and Wastes		
Short-term, minor impacts would occur from the use of hazardous materials and petroleum products and the generation of hazardous wastes.	No impacts on hazardous materials and wastes would occur under the No Action Alternative.	• USAF would implement spill prevention and control, hazardous material handling, and environmental contamination protocols. • **Appendix F** provides further details on hazardous materials and wastes compliance actions and industry standard mitigation measures.
Air Quality		
Short-term, negligible to minor impacts on air quality from air emission during construction.	Periodic, long-term, negligible to minor impacts on air quality from air emissions during minor roadway repairs.	USAF would implement fugitive dust control measures. **Appendix F** provides further details on air quality compliance actions and industry standard mitigation measures.

3. Affected Environment

This section describes the resources being analyzed, the regulatory setting for each resource, and the affected environment on Tinian and in the CNMI for the Proposed Actions, which forms the basis of the analysis presented in **Section 4**. To the extent practicable, the description of resources in this section has been revised to be consistent with conditions observed during visual inspections conducted on Tinian post-landfall of Typhoon Yutu in October 2018. USAF reconsidered these conditions upon completion of the Draft SEIS, during review of comments on the Draft SEIS, and in finalization of this SEIS.

The affected environment described for CNMI and Tinian in Section 3 of the 2016 Divert EIS (Final EIS, Section 3) is hereby incorporated by reference; the affected environment described in **Sections 3.1 through 3.12** of this SEIS has been adopted from the 2016 Divert EIS to avoid repetitiveness and duplication of content. The 2016 Divert EIS is available for review or download from the project website at: http://pacafdivertmarianaseis.com/archive. To facilitate reader review and understanding of the affected environment, **Sections 3.1 through 3.12** each provide a brief summary from the 2016 Divert EIS of the respective resource area and include updated information, where applicable and available. Resource information in Section 3 was updated based on the physical areas being proposed for action, the type of action being proposed and the nature of potential impacts on that resource area, or because the resource has changed.

Throughout this SEIS, as applicable, the area for each of the Proposed Actions or alternatives that could be physically disturbed is referred to as the "project area." The term "project area" encompasses the locations proposed for construction for each particular Proposed Action. This SEIS uses the term "Region of Influence" (ROI) to describe the complete geographic scope of potential consequences for the resource area. For most of the resource areas, the ROI is defined as the area of Tinian affected by the construction or operation of the proposed infrastructure. For some resources, such as noise, air quality, and socioeconomics, the ROI extends into surrounding communities, or across the CNMI, unique to that specific resource.

In compliance with NEPA, CEQ, and USAF EIAP (32 CFR § 989) guidelines, this SEIS focuses on those resources potentially subject to impacts from the Proposed Actions or No Action Alternatives. This SEIS has been prepared as a concise document that addresses resource-specific concerns while meeting the comparative needs of the USAF decision makers. Public, agency, and other comments received during scoping were used to focus the analysis on those environmental resources of interest to scoping participants. Certain environmental resources were not carried forward for evaluation in this SEIS for both of the Proposed Actions because it was determined that the actions would be unlikely to impact those resources. Resources that have been eliminated from further detailed study in this SEIS and the rationale for eliminating them are presented below.

Airspace. Airspace was not evaluated because the Proposed Actions do not include any proposals for new airspace, nor do they include changes to the manner in which the existing airspace is used. Under the Proposed Actions, all aircraft operations proposed in the 2016 Divert EIS (Final EIS, Section 2.5.2) would remain unchanged and there would be no alterations

to airspace within the CNMI. Measures to avoid or rectify impacts on airfield operations during construction identified in the 2016 Divert EIS (Final EIS, Section 4.16) would be implemented during pipeline construction at the airfield. Therefore, impacts on airspace are not expected.

Visual Resources. Visual resources were not evaluated because the Proposed Actions would not impact landscapes and landforms or other features that attribute to landscape-level visually aesthetic qualities. Therefore, impacts on visual resources are not expected.

3.1 Noise

3.1.1 Definition of the Resource

Noise is generally described as unwanted sound. Sound is a physical phenomenon consisting of minute vibrations that travel through a medium, such as air or water, and are sensed by the human ear. Unwanted sound can be based on objective effects (such as hearing loss and speech interruptions) or subjective judgments (such as noise complaints and annoyance).

There are two main concepts to understand how noise is generated—sound level and frequency.

- **Sound Level.** Sound level or intensity is a measure of the loudness of a sound expressed in decibels (dB). A human ear can only detect sounds that are above a certain dB level. The other end of the spectrum is sound so loud (high dB level) that it can cause pain, discomfort, and hearing loss.
- **Frequency.** Frequency is a measure of sound-wave cycles per unit of time, with higher frequency sounds dispersing more quickly than those at lower frequencies. The standard unit of measurement for sound wave frequency is cycles per second, expressed as hertz.

Sound waves move outward in all directions from the source and weaken as the distance from the source increases. Sound waves (i.e., noise) can also be diminished or enhanced by wind movement, terrain, ground cover, and temperature. Human hearing can generally perceive frequencies between 20 and 20,000 hertz. The human ear cannot hear sounds above and below these frequencies.

Regulatory Framework

Noise Metrics and Regulations. Although individual human response to noise varies, projected noise levels and zones can be modeled to predict typical human responses. "A-weighted decibel" (dBA) is used to characterize sound levels that can be sensed by the human ear. "A-weighted" denotes the adjustment of the frequency range to what the average human ear can sense when experiencing an audible event. The threshold of audibility is generally within the range of 10 to 25 dBA for normal hearing. The threshold of pain occurs at the upper boundary of audibility, which is normally in the region of 135 dBA (USEPA 1981b). **Table 3.1-1** compares common sounds and shows how they rank in terms of the effects of hearing. As shown, a whisper is normally 30 dBA and considered to be very quiet while an air conditioning unit 20 feet away is considered an intrusive noise at 60 dBA. Noise levels can

become annoying at 80 dBA and very annoying at 90 dBA. To the human ear, each 10 dBA increase seems twice as loud (USEPA 1981a). Additionally, although noise generated from a source is constant, the perceived noise level decreases by approximately 6 dB with each doubling of distance away from the source (OSHA 2013).

Table 3.1-1. Sound Levels and Human Response

Noise Level (dBA)	Common Sounds	Effect
10	Just audible	Negligible*
30	Soft whisper (15 feet)	Very quiet
50	Light auto traffic (100 feet)	Quiet
60	Air conditioning unit (20 feet)	Intrusive
70	Noisy restaurant or freeway traffic	Telephone use difficult
80	Alarm clock (2 feet)	Annoying
90	Heavy truck (50 feet) or city traffic	Very annoying Hearing damage (8 hours)
100	Garbage truck	Very annoying*
110	Pile drivers	Strained vocal effort*
120	Jet take-off (200 feet) or auto horn (3 feet)	Maximum vocal effort
140	Carrier deck jet operation	Painfully loud

Source: USEPA 1981a
Note: *HDR estimation

Noise annoyance can be especially impactful on noise sensitive receptors (NSRs), which are defined as locations or areas where dwelling units or other fixed, developed sites of frequent human use occur. Generally, NSRs include people living in residential areas, students in schools, and patients in hospitals.

Under the Noise Control Act of 1972, the Occupational Safety and Health Administration (OSHA) established workplace standards for noise. The minimum requirement states that constant noise exposure must not exceed 90 dBA over an 8-hour period. The highest allowable sound level to which workers can be exposed to over a specified length of time is 115 dBA and exposure to this level must not exceed 15 minutes within an 8-hour period. The standards limit instantaneous exposure, such as impact noise, to 140 dBA. If noise levels exceed these standards, employers are required to provide hearing protection equipment that will reduce sound levels to acceptable limits.

Sound levels, resulting from multiple single events, are used to characterize noise effects from aircraft or vehicle activity and are referred to as a day-night sound level (DNL). The DNL noise metric incorporates a “penalty” for nighttime noise events to account for increased annoyance. DNL is the energy-averaged sound level measured over a 24-hour period. To account for the perception of increased noise during normally quiet times, an additional 10-dBA is added to noise events occurring between 10 p.m. and 7 a.m. DNL is the designated noise metric of the FAA, U.S. Department of Housing and Urban Development (HUD), USEPA, and DOD for modeling airport environments.

Land use guidelines identified by the Federal Interagency Committee on Urban Noise and FAA, Part 150–Airport Noise Compatibility Planning regulation (14 CFR § 150), are used to determine compatible types of land use surrounding airports within the 65 to 80+ dBA DNL noise contours (FICUN 1980). DOD, USEPA, FAA, and HUD use these guidelines in their noise policies and programs. For outdoor activities, USEPA recommends 55 dBA DNL as the sound level below which there is no reason to suspect that the general population would be at risk from any of the effects of noise. For indoor activities, USEPA recommends 45 dBA DNL (USEPA 1974).

Ambient Sound Levels. Noise levels vary depending on the housing density and proximity to parks and open space, major traffic areas, or airports. As shown in **Table 3.1-2**, the noise level in a normal suburban area is approximately 55 dBA DNL, which increases to 60 dBA for an urban residential area, and to 80 dBA in the downtown section of a city (USEPA 1974). Most people are exposed to sound levels of 50 to 55 dBA or higher on a daily basis.

Table 3.1-2. Typical Outdoor Noise Levels

dBA DNL	Location
50	Residential area in a small town or quiet suburban area
55	Suburban residential area
60	Urban residential area
65	Noisy urban residential area
70	Very noisy urban residential area
80	City noise (downtown of major metropolitan area)
88	3rd floor apartment in a major city next to a freeway

Source: USEPA 1974

Construction Sound Levels. Building demolition and construction can cause an increase in sound well above the ambient level. Sounds emitted during construction typically vary according to the type of work equipment being used. **Table 3.1-3** lists noise levels associated with common types of construction equipment. Construction equipment usually exceeds the ambient sound levels by 20 to 25 dBA in an urban environment and up to 30 to 35 dBA in a quiet suburban area.

Table 3.1-3. Noise Levels Associated with Construction Equipment

Construction Equipment	Predicted Noise Level at 50 feet (dBA)
Backhoe	72–93
Concrete mixer	74–88
Crane	75–87
Front loader	72–83
Grader	80–93
Jackhammer	81–98
Paver	86–88
Pile driver	95–105
Roller	73–75
Truck	83–94

Source: USEPA 1971

3.1.2 Existing Conditions

The ambient noise environment on Tinian is typical of a rural town or small suburban area. Traffic activity and associated traffic noise is low due to the low population density on the island. Major sources of noise on Tinian include aviation and ground-training activities that occur at the Tinian MLA, private heliports, and the aircraft operations at Tinian International Airport. The MLA supports intermittent small unit-level training up to large field exercises and expeditionary warfare training. Noise from intermittent military operations generally does not extend into populated areas (DON 2010b). Except in the immediate proximity of the airfield during training activities, noise exposure for the entire island exists at or below 65 dB, a noise level considered to be compatible with almost any land use (e.g., schools, hospitals, places of worship, residential, and commercial areas) (DON 2015a, USAF 2016a). NSRs on Tinian are shown in **Table 3.1-4**.

Table 3.1-4. NSRs Tinian

NSR	Type
Tinian High School	School
Tinian Elementary School	School
Northern Marianas College, Tinian	School
City of San Jose	Residential Area
Kammer Beach	Recreational and Residential Area
Marpo Heights	Residential Area
Northeast Marpo Heights	Residential Area
San Jose Catholic Church	Place of Worship
Tinian Health Center	Medical Facility

3.2 Biological Resources

3.2.1 Terrestrial Biological Resources

3.2.1.1 Definition of the Resource

Terrestrial biological resources include vegetation, wildlife, and the ecosystems in which these resources occur. Specific concerns relating to terrestrial biological resources considered in this SEIS include declines in species diversity and impacts on special status species. Biological resources are protected by federal or CNMI regulations.

***Migratory Bird Treaty Act*.** The Migratory Bird Treaty Act (MBTA) provides USFWS regulatory authority to protect migratory birds. The MBTA regulates any "take" of these species. "Take" is defined per 50 CFR § 10.12 as to "*hunt, shoot, wound, kill, trap, capture, or collect*."

Endangered Species Act. The federal ESA requires that all federal agencies seek to conserve threatened and endangered species and utilize their authorities in furtherance of the purposes of the ESA (Sec. 2(c)). Section 7 consultations with USFWS ensure that "any action authorized, funded, or carried out by such an agency...is not likely to jeopardize the continued existence of any endangered or threatened species..." (Sec. 7(a)(2)).

Fish, Game, and Endangered Species Act. The Government of the CNMI has concurrent jurisdiction over all federally protected wildlife and has the authority to list non-federally protected species as endangered under Public Law (P.L.) #2-51, the "Fish, Game, and Endangered Species Act." The CNMI Government maintains a separate listing of locally endangered plant and animal species that is more extensive than the list of species protected under the ESA.

3.2.1.2 Existing Conditions

A survey was conducted from May 12 to 16, 2018, by biologists familiar with the flora and fauna of the Mariana Islands, to characterize flora and fauna within the project areas; the results of this survey are provided in a Biological Survey Report in **Appendix D** and are used to describe the existing conditions in the project areas in the subsections below.

Vegetation. Biologists identified 141 flora species (40 native and 101 nonnative) in six vegetation communities and other land cover types within the project areas during the May 2018 surveys, as shown in **Table 3.2-1** and **Figure 3.2-1**. Descriptions of each vegetation type noted in **Table 3.2-1** in the project areas are provided in the Biological Survey Report in **Appendix D**.

Table 3.2-1. Vegetation Communities within the Project Areas on Tinian

Vegetation Type	Acres	Percentage
West Route and Support Infrastructure		
Mixed Introduced Forest	31.09	30
Urban and Built-up	24.55	24
Leucaena Leucocephala (Tangantangan)	21.78	21
Other Shrub and Grass	19.3	19
Urban Vegetation	6.13	6
Casuarina Thicket	0.78	<1
East Route and Support Infrastructure		
Leucaena Leucocephala (Tangantangan)	38.53	30
Mixed Introduced Forest	34.15	27
Urban and Built-up	25.21	20
Other Shrub and Grass	22.36	17
Urban Vegetation	7.75	6
Casuarina Thicket	0.78	<1
Roadway Improvement Sections		
Leucaena Leucocephala (Tangantangan)	20.19	33
Urban and Built-up	19.37	32
Other Shrub and Grass	9.69	16
Urban Vegetation	7.91	13
Mixed Introduced Forest	3.95	6

Source: Liu and Fischer 2006, HDR 2018a

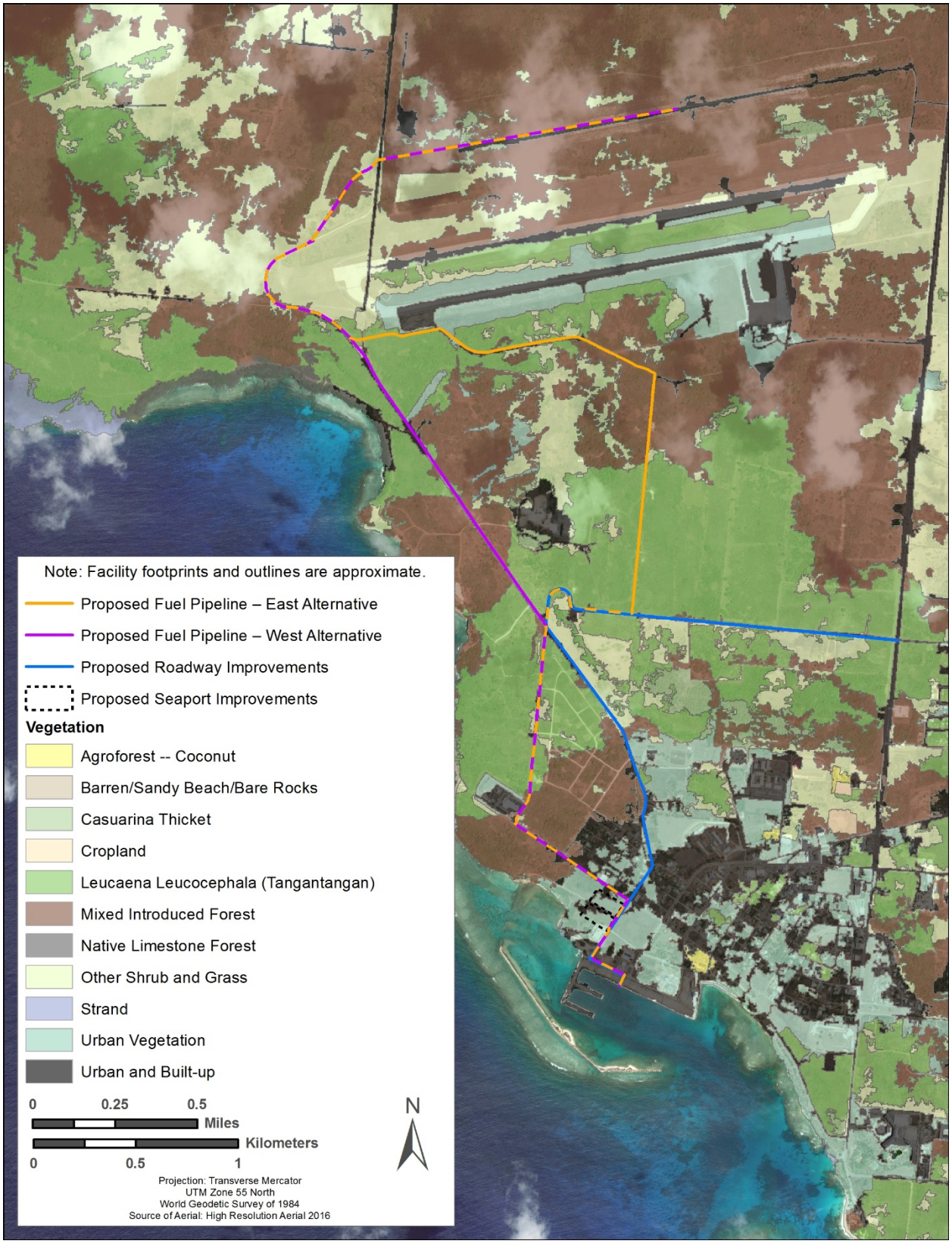


Figure 3.2-1. Vegetation Communities within the Project Areas

Following Typhoon Yutu in October 2018, visual inspections noted that foliage was removed from vegetation in the upper stratums (canopies) and tangantangan on Tinian, and some individuals were uprooted. It is anticipated that regrowth will occur within the upper stratum consistent with observations during the May 2018 surveys. Additionally, the area proposed for the seaport improvements was covered with gravel and used for a staging effort during Typhoon Yutu recovery efforts, reducing the amount of urban vegetation within the project areas for both alternatives. It is unknown whether this area will be revegetated once typhoon recovery is complete.

Wildlife. The following description of fauna within and near the project areas was based on observations during the May 2018 surveys, previous characterizations, and investigations of wildlife on Tinian (USFWS 2009a, NAVFAC 2014a, CNMI DFW 2015). A list of wildlife species observed is available in the Biological Survey Report in **Appendix D**.

Mammals. The only native mammal on Tinian is the Mariana fruit bat (*Pteropus mariannus mariannus*), which is described under ***Special Status Species***. Four nonnative mammals were observed during the 2018 survey: feral dogs (*Canis lupus familiaris*), feral cats (*Felis silvestris catus*), Polynesian rats (*Rattus exulans*), and musk shrew (*Suncus murinus*). All of the feral cats and dogs were observed within the town of San Jose, or along roadsides, especially near the Tinian Municipal Dump.

Birds. Over 40 native species of birds have been reported on Tinian, including forest birds, shorebirds, waterfowl, waterbirds, and seabirds, and there are numerous nonnative species (USFWS 2009a, NAVFAC 2014a, DON 2015a). During the 2018 surveys, the most commonly observed native species included the Mariana fruit dove (*Ptilinopus roseicapilla*), Micronesian starling (*Aplonis opaca*), collared kingfisher (*Halcyon chloris*), white tern (*Gygis alba*), and rufous fantail (*Rhipidura rufifrons*). Tinian monarchs (*Monarcha takatsukasae*) also were frequently observed in the project areas and were previously being reviewed for listing under the federal ESA. In December 2018, USFWS announced relisting of the Tinian monarch was not warranted (USFWS 2018). As mentioned in the ***Vegetation*** section, Typhoon Yutu removed foliage from vegetation in the upper stratums (canopies) and tangantangan on Tinian, and uprooted some individuals. Therefore, the prevalence of forest bird species on Tinian could be less than that identified in the May 2018 surveys because canopy cover is no longer present for shelter and nesting. However, it is anticipated that these species will return as regrowth of foliage in this upper stratum occurs.

Reptiles and Amphibians. There are eight native reptiles (including two marine turtles protected under the ESA) and no native amphibians on Tinian. The Micronesian gecko (*Perochirus ateles*) is classified by the government of CNMI as threatened and endangered (CNMI DFW 2015). There also are numerous nonnative reptiles and amphibians, including the following species observed in the 2018 survey: green anoles (*Anolis carolinensis*), green tree skink (*Lamprolepis smaragdina*), curious brown skink (*Carlia fusca*), and cane toad (*Rhinella marina*).

Invertebrates. Native invertebrate species include three crab species and one snail, the native humped tree snail (*Partula gibba*), which is classified as endangered under the ESA (USFWS 2009a, DON 2015a). No invertebrates were observed during the May 2018 survey (HDR 2018a).

Special Status Species. Seven terrestrial species classified as threatened or endangered, under the federal ESA occur or have been documented in the recent past on Tinian. Additionally, two terrestrial species are documented as threatened and endangered under CNMI regulation, only. All nine of the terrestrial species classified as threatened or endangered under the federal ESA or CNMI regulations that could occur within or near the project area species are provided in **Table 3.2-2** (USFWS 2015b, 80 FR 59424).

Table 3.2-2. Terrestrial Threatened and Endangered Species with Potential to Occur in the Project Area

Common Name	Scientific Name	Federal Status	CNMI Status	Present[1]	Comments
Birds					
Mariana common moorhen	*Gallinula chloropus guami*	E	TE	No	No suitable wetland habitat within or near the project area. Not observed during May 2018 survey.
Micronesian megapode	*Megapodius laperouse*	E	TE	Unlikely	Rare on Tinian. No suitable limestone forest habitat in project area. Not observed during May 2018 survey.
Crustaceans and Mollusks					
Humped tree snail	*Partula langfordi*	E	-	Unlikely	Rare on Tinian in moist, native forests. Not observed during May 2018 survey.
Mammals					
Mariana fruit bat	*Pteropus mariannus mariannus*	T	TE	No	Extirpated from or very rare on Tinian (USFWS 2014). No suitable habitat within or near the project area. Not observed during May 2018 survey.
Reptiles					
Micronesian gecko	*Perochirus ateles*	-	TE	Unlikely	Rare on Tinian in native limestone forests. Not observed during May 2018 survey.
Plants					
Berenghenas halomtano	*Solanum guamense*	E	-	No	Rare or extirpated on Tinian. No steep topography with native limestone forest within or near project area. Not observed during May 2018 survey.
Fadang	*Cycas micronesica*	T	-	Yes	Two planted individuals occur along TR26 in San Jose associated with the Nanyo Kohatsu Kabushiki Kaisha Administration Building and Laboratory Historic Site.
No common name	*Dendrobium guamense*	T	-	No	Uncommon on Tinian. No suitable native limestone forest in project area. Not observed during May 2018 survey.
Ufa-halomtano	*Heritiera longipetiolata*	E	-	No	Uncommon on Tinian. No suitable coastal native forest within the project area. Not observed during May 2018 survey.

Source USFWS 2015b, 79 FR 59364, HDR 2018a

Note: [1] Likelihood of presence within the Project Area

Key: E = Endangered, T = Threatened, R = Under Review, TE = Threatened and Endangered under CNMI Law

During the 2018 surveys of the project areas, biologists identified and documented only one of these species, the fadang, which is further described in the paragraphs below. Descriptions of special status species with the potential to occur in the project area are provided in the Biological Survey Report in **Appendix D.** The Biological Survey Report also addresses the Tinian monarch, as it was under review for listing at the time the biological survey was complete in 2018. In December 2018, USFWS made the determination that relisting of the Tinian monarch was not warranted (USFWS 2018).

Fadang is a native cycad that has been reintroduced on Tinian. Over 900 individuals of this species were observed near Mount Lasso in 2016 in an area where they were planted by the CNMI Department of Land and Natural Resources in 2008–2009 (NAVFAC 2017). A small number of individuals also occur along roadsides and at a shrine in the town of San Jose and elsewhere on southern Tinian (NAVAFC 2017). Two fadang were observed during the 2018 survey approximately 20 feet southwest of the edge of road TR26, adjacent to the proposed shared East and West pipeline route. The two individuals were planted as part of a decorative landscape for the Nanyo Kohatsu Kabushiki Kaisha Administration Building and Laboratory (HDR 2018b). During visual inspections following Typhoon Yutu, these two individuals appeared unaffected by the October 2018 typhoon and intact.

Five other federally listed species historically occurred on Tinian, including the Mariana swiftlet (*Aerodramus vanikorensis bartschi*), nightingale reed-warbler (*Acrocephalus luscinia*), Slevin's skink (*Emoia slevini*), Pacific sheath-tailed bat (*Emballonura semicaudata rotensis*) and the orchid *Tuberolabium guamense* (USFWS 1998a, Cruz et al. 2008, USFWS 2010b). These species no longer occur on Tinian; further detail regarding these species is included in the 2018 Biological Assessment (HDR 2018b).

Wetlands. Information on wetlands is provided in **Section 3.8.2**.

3.2.2 Marine Biological Resources

3.2.2.1 Definition of the Resource

This section describes existing environmental conditions for marine biological resources potentially affected by the Proposed Actions described in **Sections 2.2** and **2.3**. Marine biological resources include those marine species and habitats that could be affected by the construction and operation of the pipeline routes, seaport support infrastructure, or roadway improvements. All project activities would occur onshore and marine biological resources that occur in the marine environment surrounding Tinian, therefore, would not be directly affected. This section describes the regulated marine biological resources that could be indirectly affected by a change in water quality resulting from an increase in sedimentation, change in stormwater flow, or fuel spill during or following construction of a pipeline or improvement of roads. Specifically this section describes EFH there that is regulated under the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA) and threatened and endangered species that occur in the marine environment surrounding Tinian.

Essential Fish Habitat. Section 305(b) of the MSFCMA mandates that federal agencies consult with the Secretary of Commerce on all proposed activities authorized, funded, or undertaken by the agency that might adversely affect EFH. EFH is defined as those waters and

substrate necessary to fish for spawning, breeding, feeding, or growth to maturity. Within the EFH, Habitat Areas of Particular Concern are specific areas that are essential to the life cycle of important coral reef species.

Special Status Species. The federal ESA requires that all federal agencies seek to conserve threatened and endangered species and utilize their authorities in furtherance of the purposes of the ESA (Sec. 2(c)). Section 7 consultations with NMFS ensure that "any action authorized, funded, or carried out by such an agency...is not likely to jeopardize the continued existence of any endangered or threatened species..." (Sec. 7(a)(2)).

3.2.2.2 Existing Conditions

Essential Fish Habitat. The Mariana Islands are within the jurisdiction of the Western Pacific Region Fishery Management Council (WPRFMC). WPRFMC currently manages fisheries in the Western Pacific as five assemblages (or management units) under two fishery ecosystem plans (WPRFMC 2009a, WPRFMC 2009b). These assemblages include (1) bottomfish, (2) crustaceans, (3) precious corals, (4) coral reef ecosystems, and (5) pelagic species. The project areas include only land areas adjacent to marine waters, but not within marine waters; **Table 3.2-3** lists the fishery assemblages and lifestages with EFH adjacent to the project areas on Tinian.

Table 3.2-3. Fishery Assemblages and Lifestages with EFH that Occurs Adjacent to the Project Areas on Tinian

Fishery Assemblage	Lifestage				
	Eggs	Larvae	Juveniles	Adults	Spawning Adults
Bottomfish[1]	Water column	Water column	Water column, bottom habitat	Water column, bottom habitat	None designated
Crustaceans[1,3]	None designated	Water column	Bottom habitat	Bottom habitat	None designated
Precious Corals[1,4]	None designated adjacent to the project area.				
Coral Reef Ecosystems[1,4]	Water column, bottom habitat (Habitat Area of Particular Concern is designated in Saipan Lagoon)				
Pelagic Species[2]	Epipelagic zone (water surface to depths of approximately 200 meters)	Epipelagic zone (water surface to depths of approximately 200 meters)	Water column	Water column	None designated

Sources:
[1] WPRFMC 2009a
[2] WPRFMC 2009b
Notes:
[3] Spiny lobster (Family Palinuridae), slipper lobsters (Family Scyllaridae), and Kona crab (*Ranina ranina*) are the only group of crustaceans with EFH designated adjacent to the project area.
[4] EFH is not designated by lifestage for precious corals and coral ecosystems.

Special Status Species. At least 14 marine species classified as threatened or endangered under the federal ESA occur or could occur in the waters surrounding Tinian (see **Table 3.2-4**).

Four listed species of sea turtles have been documented near Tinian. Green sea turtles and hawksbill sea turtles are known to forage offshore of Tinian, and there is a small population of green sea turtles that nests on Tinian (Pultz et al. 1999, Kolinski 2001, Maison et al. 2010, NAVFAC 2014b). Nesting by green sea turtles likely occurs on all or most of the beaches on Tinian (Minton et al. 2009, Maison et al. 2010, DON 2010a), and nesting activity has been observed in all months (NAVFAC 2014b). Leatherback sea turtles are uncommon in the Tinian area; however, there have been two sightings of the species in open water (DON 2015a). The CNMI is part of the migratory range of olive ridley sea turtles, but they are not known to nest there (WRPFMC Undated).

Table 3.2-4. Marine Threatened and Endangered Species with Potential to Occur Near Tinian

Common Name	Scientific Name	Federal Status	CNMI Status
Blue whale	*Balaenoptera musculus*	E	
Fin whale	*Balaenoptera physalus*	E	
Humpback whale (Western North Pacific DPS)	*Megaptera novaeangliae*	E	
Sei whale	*Balaenoptera borealis*	E	
Sperm whale	*Physeter catodon*	E	
Green turtle CWP DPS[1]	*Chelonia mydas*	T	TE
Hawksbill turtle	*Eretmochelys imbricata*	E	TE
Leatherback turtle	*Dermochelys coriacea*	E	
Olive ridley turtle	*Lepidochelys olivacea*	T	TE
Scalloped hammerhead shark (Indo-West Pacific DPS)	*Sphyrna lewini*	T	
Giant manta ray	*Manta birostris*	T	
Coral – No common name	*Acropora globiceps*	T	
Coral – No common name	*Acropora retusa*	T	
Coral – No common name	*Seriatopora aculeata*	T	

Key: E = Endangered, T = Threatened, TE = Threatened and Endangered under CNMI Law
Note: [1] Likelihood of presence within the Project Area

Scalloped hammerhead sharks are found worldwide in coastal warm temperate and tropical seas in the Atlantic, Pacific, and Indian Oceans between 46°N and 36°S. The giant manta ray is found worldwide in tropical, subtropical, and temperate bodies of water; it is commonly found offshore, in oceanic waters, and near productive coastlines. Scalloped hammerhead sharks and giant manta rays were not observed during Tinian coastal surveys conducted in 2013 for corals and sea turtles (NAVFAC 2014b).

Three species of ESA-listed coral could occur offshore of Tinian (see **Table 3.2-4**), although only one of these species, *Acropora globiceps*, has been documented to date (NAVFAC 2014b). Colonies of *Acropora globiceps* occur in the intertidal zone, upper reef slopes, and reef flats in water shallower than 26 feet (DON 2015a).

At least 26 marine mammals protected under the Marine Mammal Protection Act occur in the waters around the Mariana Islands (NMFS 2012, DON 2015a). Because deep waters come

close to shore around the Mariana Archipelago, it is possible that deepwater marine mammal species (those occurring along and seaward of the shelf break) could make their way into waters within a few miles of shore (e.g., sperm whales) (DON 2007, Fulling et al. 2011). The most common species found near shore and in shallow water are spinner dolphins, bottlenose dolphins, and short-finned pilot whales.

3.3 Cultural Resources

3.3.1 Definition of the Resource

Cultural resources are any prehistoric or historic district, site, building, structure, or object considered important to a culture, subculture, or community for scientific, traditional, religious, or other purposes. These include archaeological resources (prehistoric and historic), historic architectural resources, and traditional resources. Traditional resources can include archaeological resources, sacred sites, structures, buildings, and districts. Sacred sites are discrete locations with religious significance to, or ceremonial use by, an indigenous religion. Cultural resources that are historically or culturally significant and retain historic integrity are termed "historic properties" and are eligible for listing on the National Register of Historic Places (NRHP). Traditional resources identified by Native American tribes or other groups that are eligible for listing on the NRHP are sometimes referred to as Traditional Cultural Properties (TCP).

In addition to NEPA, USAF has met its obligations under Section 106 of the NHPA. The NHPA provides a framework for determining whether cultural resources are eligible for NRHP listing, establishes preservation programs, and establishes requirements for federal agencies in the management and treatment of historic properties. Section 106 of the NHPA (54 U.S.C. § 306108) requires federal agencies to consider the effects of their actions, termed "undertakings," on historic properties. USAF has defined the Tinian Divert Infrastructure Improvements project to include both pipeline route alternatives, inclusive of the seaport support infrastructure, and the road improvements, as a part of the Divert Activities and Exercises Undertaking. USAF completed consultation under Section 106 of the NHPA with the CNMI SHPO, Advisory Council on Historic Preservation (ACHP), National Park Service (NPS), Joint Region Marianas, FAA, CNMI Governor's office, CNMI Historic Preservation Review Board, and members of the public.

The study area for cultural resources is the area where the Proposed Actions have the potential to affect existing or potential archaeological, historic, architectural, or traditional resources, also known as the APE. The ACHP's regulations implementing Section 106 define the APE as "the geographic area or areas within which an Undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist" (36 CFR § 800.16(d)). As part of the Section 106 consultation for this effort, USAF engaged the public and consulting parties to develop an appropriate APE for the Proposed Actions and alternatives. The APE consists of a 100-foot corridor along each pipeline alternative from the ground surface to a depth of 4 feet; an 8.2-acre area at the seaport, from the ground surface to a variable depth of 1 to 3 feet; and existing roadways where improvements could occur, including 15 feet on either side of the road surface, from the ground surface to a depth of 1 foot (see **Figure 2.4-1**).

3.3.2 Existing Conditions

A detailed cultural history of the Mariana Islands and the island of Tinian is presented in the 2016 Divert EIS (Final EIS, Section 3.8.4) and is incorporated by reference. The 2016 Divert EIS is available for review or download from the project website at: http://pacafdivertmarianaseis.com/archive. A brief summary of the cultural setting of Tinian is presented here, followed by a discussion of cultural resource investigations in the APE and identified cultural resources. The APE for the Proposed Action encompasses areas not analyzed in the 2016 Divert EIS and information is presented discussing cultural resources identified in these new areas. Updated information is also presented for one resource discussed in the 2016 Divert EIS, site TN-6-0030 (West Field), based on the results of recent archaeological study (Leclerc et al. 2018a).

Cultural Setting. Tinian and the rest of the Mariana Islands were the earliest islands settled in Pacific Oceania, with the first people arriving approximately 3,500 years ago. These early inhabitants lived on and near the ancient shoreline, which was approximately 6 feet higher than today (Carson 2014, Carson 2016). As relative sea levels declined over time, changes in the reef prompted shifts in preferred or available foods and also corresponded with increased reliance on inland agriculture. The Latte period began as early as A.D. 800 and is named for the period's most distinctive remains: stone columns overlaid with carved semispherical capstones called *latte* in the Chamorro language. The Latte period and *latte* construction on Tinian extended well past initial contact with Europeans until about 1700 when the Spanish forcibly concentrated all Chamorro people in villages on Guam and Rota, sometimes referred to as the *Reducción*.

Spain maintained colonial control of the Mariana Islands until the Spanish-American War, after which Germany briefly gained control of what is now the CNMI. Little evidence has been found on Tinian from the Spanish or German occupations. The Japanese captured the Northern Mariana Islands from Germany during World War I and developed numerous sugarcane plantations on Tinian. Beginning in 1939, Japan began fortifying Tinian for war. The U.S. military invaded Tinian in July 1944 and established two B-29 airbases and cantonments for over 150,000 military personnel. Following the conclusion of World War II, most military construction on Tinian was demolished and salvaged.

Cultural Resource Surveys. Most of the APE was previously surveyed for cultural resources between 1986 and 2015; however, many of these efforts were inadequate by current standards or were monitoring projects. Therefore, USAF performed new investigations along all portions of the APE except the immediate harbor facilities, which were evaluated in 2010. A Phase I pedestrian survey of the APE was completed in May 2018, during which archaeologists examined the ground surface for archaeological and architectural remains. The survey included a literature review of previous cultural resources work in and around the APE. The literature review and Phase I survey identified 35 sites in the APE, discussed below. Exact locations of some sites were unavailable from the literature review, and of the 35 sites, only 26 were documented in the APE during the Phase I pedestrian survey.

Identified Resources. A total of 35 cultural resources were identified in the APE, of which 26 were documented during the Phase I pedestrian survey and 9 were documented only in existing

archaeological literature, some with poor locational information (see **Table 3.3-1**). The nine sites not confirmed during the survey may be outside the APE or may have been destroyed. Five sites in the APE are eligible for NRHP listing, consisting of the Tinian Harbor (3028), the Third Farm District (IV) (SC-5043), West Field (TN-6-0030), a Japanese defensive position (TN-5-0690), and the Nan'yō Kōhatsu Kabushiki Kaisha (NKK) sugar mill district (TN-4-1010). Site TN-4-1010 also contains two buildings that are individually listed in the NRHP. In addition to these five sites, a newly recorded multicomponent site requires additional work to evaluate the site's prehistoric component for NRHP eligibility (HDR-18-07). This site is considered potentially eligible for the purposes of this SEIS. Eligible and potentially eligible sites are discussed individually below.

Table 3.3-1. Cultural Resources Identified in the APE

Site Number	Description	Significance (NRHP Criteria)[a]	Action/Alternative
3028/Tinian Harbor	Historic Tinian Harbor	Eligible (A, C)	East route West route
T-1	U.S. World War II camp possibly associated with Group Pacific (GROPAC) 6 and/or 27th Special Naval Construction Battalion	Not Eligible	East route West route
T-10	U.S. World War II structures associated with Tinian Harbor	Not Eligible	East route West route Support Infrastructure
1571-T-60[b]	Historic and pre-contact artifact scatter	Not Eligible	West route
1571-T-61[b]	Pre-contact artifact scatter	Not Eligible	West route
1571-T-62	Historic and pre-contact artifact scatter	Not Eligible	West route
1571-T-64[b]	Historic and pre-contact artifact scatter	Not Eligible	West route
1571-T-65[b]	Historic and pre-contact artifact scatter	Not Eligible	East route West route
PSCI-60[b]	Japanese colonial period artifact scatter and bamboo grove.	Not Eligible	East route West route
SC-5043[b]	Third Farm District (IV)	Eligible (A, D)	East route West route
HDR-18-01	Historic period multi-use dump	Not Eligible	East route West Route
HDR-18-02	Small historic-era depression with subterranean chamber (possible cistern or culvert, potentially destroyed)	Not Eligible	East route West route Support Infrastructure
HDR-18-03	Small historic-era depression (potentially destroyed)	Not Eligible	East route West route Support Infrastructure
HDR-18-04	Push pile with World War II-era debris	Not Eligible	East route West route
HDR-18-05	Push pile	Not Eligible	East route West route

Site Number	Description	Significance (NRHP Criteria)[a]	Action/Alternative
HDR-18-06	Push pile with World War II-era debris	Not Eligible	East route
HDR-18-07	Japanese gun emplacement with historic and pre-contact artifact scatter	Potentially Eligible (D)	East route West route
HDR-18-08	Possible road or railroad grade	Not Eligible	East route West route
HDR-18-09	Large berm or push pile	Not Eligible	East route
HDR-18-10	Large berm or push pile	Not Eligible	East route
HDR-18-IF-01	Push pile with no artifacts	Not Eligible	East route West route
HDR-18-IF-02	Push pile with WWII-era debris	Not Eligible	East route
HDR-18-IF-03	Push pile with no artifacts	Not Eligible	East route West route
HDR-18-IF-04	Historic period rock alignment with no artifacts	Not Eligible	East route West route
HDR-18-IF-05	Push pile with no artifacts	Not Eligible	East route West route
HDR-18-IF-06	Isolated flag pole bases, removed and dumped	Not Eligible	East route West route
HDR-18-IF-07	Partially buried metal conduit with concrete pylon	Not Eligible	West route
HDR-18-IF-08	Late historic artifact scatter	Not Eligible	East route
HDR-18-IF-09	Depression with late historic period artifacts	Not Eligible	West route
HDR-18-IF-10	Pre-contact ceramic sherd	Not Eligible	West route
TN-6-0030	West Field	Eligible (A, C, D)	East route West route
TN-5-0690[b]	Japanese defensive position	Eligible (A, C, D)	East route West route
TN-6-0692[b]	World War II airplane remains	Not Eligible	East route West route
TN-5-0695[b]	Japanese colonial railroad cart	Not Eligible	East route West route
TN-4-1010	NKK Sugar Mill (Administration Building and Laboratory Building)	NRHP-Listed	East route West route

Source: Leclerc et al. 2018b

[a] The NRHP Criteria of Significance are:

A) Properties associated with events that have made a significant contribution to the broad patterns of our history.

B) Properties associated with the lives of persons significant in our past.

C) Properties that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction.

D) Properties that have yielded or may be likely to yield information important in prehistory or history.

[b] Not located during Phase I survey.

Following Typhoon Yutu in October 2018, visual inspections noted that the area proposed for the seaport improvements was covered with gravel and used for staging materials and equipment for typhoon recovery efforts. This activity appears to have potentially destroyed two sites documented during the Phase I pedestrian survey (HDR-18-02 and HDR-18-03) and severely impacted site T-10. A U.S. Navy construction battalion camp, Camp Adams, was established on part of TN-6-0030, West Field, during typhoon recovery efforts. Use of the former airfield pavements does not appear to have affected the site. Remaining NRHP-eligible sites identified in the APE appeared intact and unaffected during the visual inspections.

3028, Tinian Harbor. Historic features of the Tinian Harbor consist of seven structures built by the U.S. Navy during World War II. These are the wharf (or quay), two bulkheads (or quay walls), two piers, the causeway, and the breakwater. The site also includes a dredged turning basin and navigable channel.

SC-5043, Third Farm District (IV). Site SC-5043 is a large site that designates a portion of the Japanese Third Farm District and extends well beyond the APE. The site incorporates several smaller sites, such as a Japanese farmstead and railroad berm, none of which are within the APE.

HDR-18-07. Site HDR-18-07 is a Japanese gun emplacement recorded during USAF's Phase I survey. A single pre-contact ceramic sherd was observed nearby the feature. Additional research is needed to determine whether the site is eligible for NRHP listing. The site is assumed eligible for the purposes of this SEIS.

TN-6-0030, West Field. West Field was one of two airbases built on Tinian for B-29 aircraft and also incorporated Naval Air Station Tinian. The site was also in the APE for the 2016 Divert EIS, and information about the site in that EIS is incorporated by reference. (The 2016 Divert EIS is available for review or download from the project website at: http://pacafdivertmarianaseis.com/archive.) Aboveground structures were demolished during post-war salvage operations; however, most of the pavements remain intact. Runways 2 and 3 have been developed and incorporated into the modern Tinian International Airport. Facilities associated with the Modified Tinian Alternative of the Divert Activities and Exercises action will be built over portions of Runway 1, two taxiways, and several B-29 hardstands.

TN-5-0690. Site TN-5-0690 was recorded in 2002 as a Japanese defensive position (Dixon and Welch 2002). The site's exact location is unknown and was not located during recent pedestrian surveys of the area (Leclerc et al. 2018a, Leclerc et al. 2018b). The site may have been destroyed or may be outside the APE.

TN-4-1010. The site number TN-4-1010 has been applied broadly to the former NKK sugar mill district (Jones 1991) and more specifically to the Administration Building within the former complex (Dixon et al. 2015). We are using the broader definition in this SEIS to include all remains associated with the sugar mill complex. Remains in the APE consist of the NKK Administration Building and the NKK Laboratory, which were individually listed in the NRHP in 1981 (Jones 1980). A concrete cistern and additional slab foundations are present east-northeast of the building and are within the APE.

The Phase I survey reviewed soils and geology, land use history, previous subsurface archaeological studies, and archaeological site distribution patterns to assess the potential for buried archaeological sites in areas of the APE associated with the pipeline and Seaport Support Infrastructure. This review determined that portions of the APE at the Seaport Support Infrastructure Area and portions of the East and West pipeline alternatives have moderate to high potential for buried archaeology (**Figure 3.3-1**). The review did not include road improvements portions of the APE as proposed road improvements would be shallow and would not be likely to encounter buried archaeology. Following Typhoon Yutu in October 2018, visual inspections noted that the Seaport Support Infrastructure Area was covered with gravel and used for staging materials and equipment for typhoon recovery efforts. The extent or depth of disturbance and resulting impact on potential unidentified buried archaeological resources is unknown.

During a recent TCP study of Tinian, researchers conducted archival research, ethnographic research, and interviews with Tinian residents to identify traditional cultural practices and potential TCPs on the island (Griffin et al. 2015). No TCPs were identified in the APE.

3.4 Socioeconomics

3.4.1 Definition of the Resource

Socioeconomics encompasses economies and social elements such as population levels and economic activity, which are the focus of this analysis. Factors that describe the socioeconomic environment represent a composite of several interrelated and nonrelated attributes. Factors that are typically used as indicators of economic conditions for a geographic area include demographics, median household income, unemployment rates, employment, and housing data. Data on employment identify employment by industry or trade and unemployment trends. Data on personal income in a region are used to compare the before and after impacts of any jobs created or lost as a result of a proposed action. Data on industrial, commercial, and other sectors of the economy provide baseline information about the economic health of a region. Changes in demographic and economic conditions are typically accompanied by changes in other community components such as housing availability and the provision of public services, which are discussed in this section. Sociocultural issues, such as land ownership, quality of life, and cultural identity, are also important indicators of the socioeconomic condition of a region.

The geographic area in which a majority of the socioeconomic effects of a proposed action and alternatives would occur is defined as the socioeconomic ROI. The ROI is considered a primary effect area because it receives direct and indirect, adverse and beneficial, economic impacts from proposed actions due to factors such as residency of construction workers and employees and their dependents, commuting distances and times, and the location of businesses providing goods and services during construction and operation of the actions. Other components include regional economic activity, population, housing, and public services.

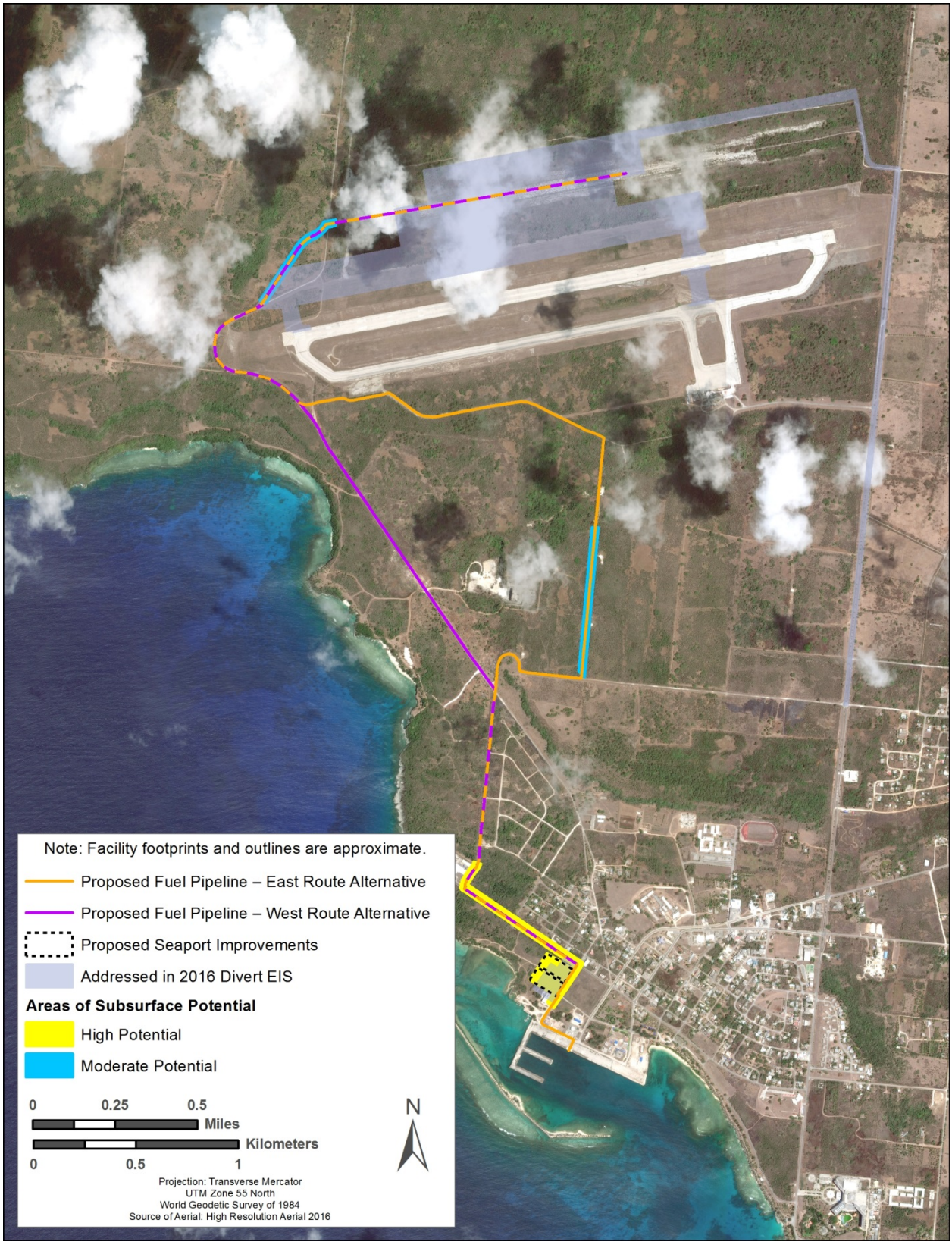


Figure 3.3-1. Potential for Buried Archaeological Sites in the APE

While the physical footprints of the Proposed Actions are confined to Tinian, most anticipated socioeconomic impacts under the Proposed Actions would likely affect CNMI as a whole due to the small size of Tinian and the CNMI. Therefore, socioeconomic data in this section are presented at the CNMI and island or municipality (i.e., Tinian) levels and, when available, for geographic subsets (i.e., Tinian villages). It should be noted that the population of Saipan accounts for approximately 90 percent of the CNMI population (CNMI Department of Commerce 2017a) and, therefore, is the primary component of any CNMI-level data. Data have been collected from previously published documents issued by federal, CNMI, and other local agencies and organizations.

3.4.2 Existing Conditions

Population Characteristics. The 2016 population of CNMI has remained relatively unchanged since 2010 (changed less than 0.1 percent), while Tinian's population has decreased by approximately 2.5 percent (see **Table 3.4-1**). In 2016, 5.7 percent of CNMI's population resided in Tinian (CNMI Department of Commerce 2017a). The estimated population of the CNMI in August 2017 was 52,263 (USCB 2018), while the mid-year Tinian population estimate was 2,626 (CNMI Department of Commerce 2018).

Table 3.4-1. Population, 1990–2016

Geographic Area	1990	2000	2010	2016
CNMI	43,345	69,221	53,883	53,890
Tinian	2,118	3,540	3,136	3,056

Sources: CNMI Department of Commerce 2015, USCB 2010a, CNMI Department of Commerce 2017a

Tinian is divided into eight villages. Tinian International Airport is in the village of Western Tinian and the Tinian seaport is in the village of San Jose. The proposed fuel pipeline and roadway improvements are in the villages of Western Tinian and San Jose. Western Tinian did not have any residents in 2010; however, San Jose had 1,939 residents, which was 61.8 percent of the Tinian population. The proposed roadway improvements would also be adjacent to Marpo Heights, which had 679 residents representing 21.7 percent of Tinian's population (USCB 2010a).

Table 3.4-2 shows the birthplace of residents of the CNMI and Tinian in 2016. Approximately 46 percent of the residents of CNMI and Tinian were born outside of the CNMI, while approximately 42 percent of the CNMI residents and 40 percent of Tinian residents were foreign born (i.e., born outside the CNMI, Guam, or the United States).

Table 3.4-2. Residents by Birthplace, 2016

Birthplace	CNMI	Tinian
	53,890 residents	**3,056 residents**
Saipan	49.9%	34.6%
Tinian	1.6%	19.7%
Rota	2.7%	0.3%
Northern Islands	0.3%	0.0%
Guam	2.1%	2.4%
United States	1.9%	2.7%
Federated States of Micronesia	3.3%	0.8%
Palau	1.3%	0.5%
China	3.4%	2.1%
Korea	1.0%	0.0%
Philippines	29.3%	29.0%
Elsewhere	3.2%	8.0%

Source: CNMI Department of Commerce 2017a

Economic Characteristics. Economic activity in the CNMI rose sharply in 2016 after several years of real gross domestic product (GDP) decreases and slower growth. In 2016, real GDP increased 28.6 percent to approximately $1.24 billion. The primary contributor to this growth was a 73.4 percent increase in exports of services consisting mainly of visitor spending (i.e., tourism), particularly on casino gambling.

In 2016, the labor forces in the CNMI and Tinian were approximately 27,102 people and 1,430 people, respectively (see **Table 3.4-3**). The construction industry accounted for 9.6 percent of the employed labor force of the CNMI (2,141 people) and 11.1 percent of the employed labor force of Tinian (122 people) (CNMI Department of Commerce 2017a).

Table 3.4-3. Employment by Industry, 2016

Employment Characteristics	CNMI	Tinian
Potential Labor Force Population (Persons 16 Years Old and Over)	38,727	2,056
Labor Force Population [1]	27,102 (70.0%)	1,430 (69.6%)
Employed Working Persons [2]	22,301 (82.3%)	1,097 (76.7%)
Percent of Employed Persons (by Industry)		
Agriculture, fishing, quarrying, utilities	1.1%	2.2%
Construction	9.6%	11.1%
Manufacturing	2.5%	2.2%
Wholesale trade and retail trade	12.5%	17.0%
Transport and warehousing	5.0%	0.7%
Information, finance, real estate	4.8%	5.9%
Professional, scientific, technical	1.8%	0.0%
Administrative support	6.4%	8.1%
Educational services	5.2%	8.9%
Health care and social assistance	5.5%	4.5%
Arts, entertainment, recreation	6.1%	3.0%
Accommodation and food service	23.3%	11.1%
Other service (except public administration)	5.8%	5.9%
Public administration	10.5%	19.2%

Sources: CNMI Department of Commerce 2017a

Notes:

[1] Labor force population is a person that is 16 years and over and either in paid employment, temporarily on leave from paid employment, or unemployed but looking for work (including first time employees).

[2] Employed working persons are those in paid employment at the time of the survey, but not those temporarily on leave from paid employment. Some people have paid employment, but were not working at the time of the survey.

Tourism. Several airlines provide service to the CNMI through Saipan International Airport. Domestic inter-island flights, such as to Tinian, are provided by Star Marianas Air and Arctic Circle Air (CPA 2018a). There is an average of 80 aircraft operations per day at Tinian International Airport of which 74 percent are air taxi (AirNav.com 2018). Visitor arrivals in the CNMI during 2017 were approximately 653,150.

The average CNMI hotel occupancy rate and hotel daily rate have steadily increased over the past several years (see **Figure 3.4-1**). In 2017, CNMI hotels had an average occupancy rate of 91 percent and the average daily hotel rate was $145.93 (CNMI Department of Commerce 2017c).

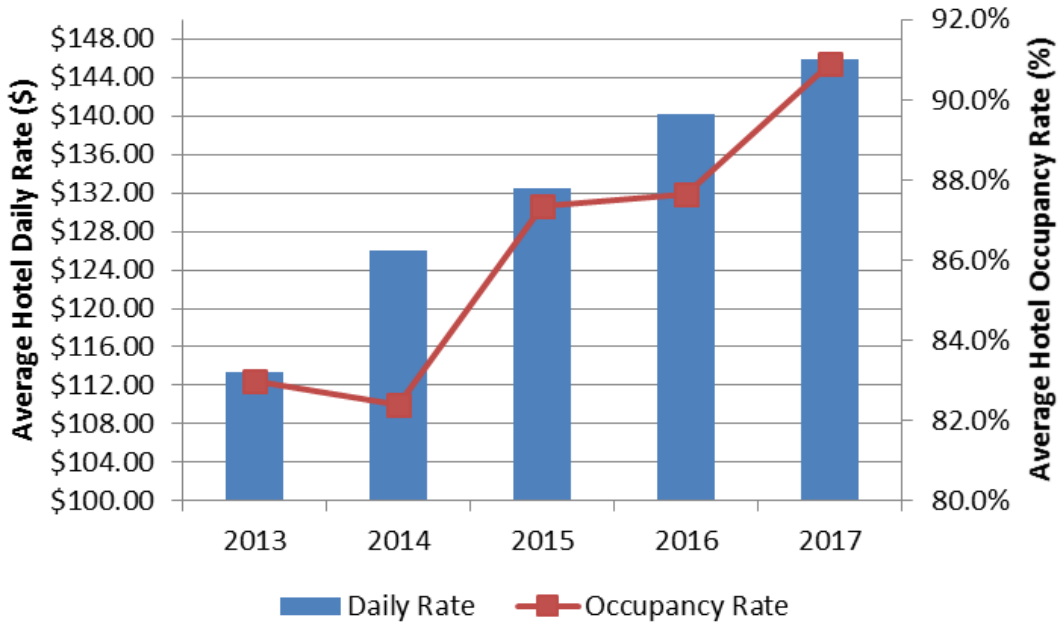


Figure 3.4-2. CNMI Average Hotel Daily Rate and Occupancy Rates, 2013–2017

While tourism is the major industry on Tinian and the CNMI, other smaller industries exist. Other industries on Tinian include commercial agriculture consisting of small-scale vegetable and fruit cultivation that is marketed locally and shipped to Saipan, a few family-owned ranches, and retail establishments in the village of San Jose (NPS 2001). In 2009, there were 31 farms on Tinian representing 2,071 acres (of which 93 percent was pasture/grazing land and 3 percent was cropland) that had a market value of approximately $264,000 for all agricultural products (USDA 2009).

Housing. In 2010, CNMI had 20,850 housing units of which 5.4 percent were on Tinian (see **Table 3.4-4**). Approximately 78.2 percent of Tinian's 1,118 housing units were occupied. Of the occupied housing units on Tinian, 51.0 percent were occupied by renters (USCB 2010b). The median house value of owner occupied units and median gross rent on CNMI was slightly more than those in Tinian. Typhoon Yutu in October 2018 damaged the majority of housing on Tinian; however, an estimate of housing units that will be repaired or rebuilt was not available as of April 2019.

Table 3.4-4. Housing Characteristics, 2010

Housing Characteristic	CNMI	Tinian
Total Housing Units*	20,850	1,118
Occupied Units	16,035	874
Owner Occupied	4,537	304
Renter Occupied	11,498	570
Vacant Units	4,815	244
Median Value of Owner Occupied Units	$123,777	$121,212
Median Gross Rent **	$324	$261
Median Gross Rent as Percentage of Household Income	20.9%	15.0%
Total Median Household Income	$19,958	$24,470
Owner Occupied	$39,032	$44,444
Renter Occupied	$16,341	$17,744

Source: USCB 2010b, USCB 2010c, USCB 2010d

Notes: * The majority of housing units on Tinian were damaged during October 2018 Typhoon Yutu.
** Gross rent is the amount of contract rent plus the estimated average monthly cost of utilities and fuels if these are paid for by the renter.

Public Services. This section addresses health and human services and public safety, as these are two public services most likely to be affected by the Proposed Actions.

Health and Human Services. Health and medical services on Tinian are provided by the Commonwealth Healthcare Corporation at the Tinian Health Center. Tinian Health Center was built in 1987 and was renovated in September 2018, and is the island's only medical facility. The health center, which has a five-bed capacity as well as an emergency room and outpatient clinic, provides emergency services, laboratory, X ray, ultrasound, pharmacy, and public health services. If necessary, patients can be evacuated from the Tinian Health Center to the Commonwealth Health Center on Saipan via airplane or U.S. Coast Guard. The Commonwealth Health Center is an 86-bed hospital on Saipan that can accommodate inpatient and outpatient medical/surgical services including obstetrics, adult and neonatal intensive care, general medicine, pediatrics, and psychiatry; emergency care; public health services; dental services; other ancillary and diagnostic services such as hemodialysis, physical therapy, respiratory care, and radiology; and has a pharmacy and medical laboratory (CHCC 2018b).

Public Safety. The CNMI Department of Public Safety (DPS) consists of four major divisions: State Police Division, State Fire Division, Bureau of Motor Vehicles, and Bureau of Investigation. DPS has a 24-hour operations center and police, fire, traffic, criminal investigation, and motor vehicle sections on Tinian. The DPS facilities in the village of San Jose are staffed by 21 police officers and 11 firefighters (De La Torre 2018, DON 2015a). Additionally, Tinian International Airport's firefighting capability can be made available to DPS in the event of a major emergency (DON 2015a). The Tinian International Airport Aircraft Rescue and Firefighting (ARFF) department has two firefighting vehicles and a staff of 10 personnel who have dual roles as ARFF personnel and Ports police officers. There is a police lockup on Tinian. Other correctional facilities, including a detention facility, jail, a women's unit, and a work release unit, are located on Saipan. These facilities are inadequate and are overcrowded (USDOI-OIA 2008).

Sociocultural Issues. This section describes sociocultural issues, such as land ownership, cultural identity, and quality of life, which contribute to the socioeconomic characteristics of Tinian and the CNMI.

Article 805 of the Covenant recognizes "the importance of the ownership of land for the culture and traditions of the people of the Northern Mariana Islands." As such, Article 11, Section 5 of the CNMI constitution sets aside portions of CNMI public lands for a homestead program. The CNMI DPL is mandated to designate public land on the CNMI, including land on Tinian, for potential homesteads for village or agricultural use. The program is intended to assist those without the means to acquire a lot and give them the opportunity to maintain a sustainable lifestyle through the granting of a portion of public land for village (residential) or agricultural purposes. Eligible persons must be of Northern Marianas descent, and can obtain one village and one agricultural homestead lot. A person of Northern Marianas descent is someone who is a citizen or national of the United States, and who has at least some degree (at least one-quarter) of Northern Marianas Chamorro or Northern Marianas Carolinian blood, or a combination thereof.

The Tinian Agricultural Homestead Act of 1988 states that public lands on Tinian that might be suitable for agricultural or grazing purposes, and that are not required for government use or other purposes, can be designated for homesteading purposes. Additional eligibility requirements for homestead applicants on Tinian include that an applicant must be a resident of Tinian for at least 5 years (Title 2 Section 4374 of the Commonwealth Code).

The U.S. citizen population of Tinian and the CNMI is primarily of Chamorro cultural descent, although Carolinians and immigrants from East Asia and Micronesia have also settled in the Mariana Islands. Chamorro life revolves around family and clans. Family loyalty is seen as important in both politics and business in the CNMI.

Quality of life is a person's overall well-being and includes many of the resource areas discussed in this SEIS. Generally, it relates to the ability of Tinian to support the Proposed Actions adequately, including how the island's general tranquility, family and community relations, cultural identity, infrastructure, social services, and standards of living could be affected.

3.5 Environmental Justice and the Protection of Children

3.5.1 Definition of the Resource

Analysis of environmental justice and other sensitive receptors is directed by 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*; and USAF's *Guide for Environmental Justice Analysis under the Environmental Impact Analysis Process (EIAP)* (USAF 2014). USAF guidance for implementation of EO 12898 is in the *Guide for Environmental Justice Analysis under the Environmental Impact Analysis Process (EIAP)*. Although not specifically identified as environmental justice populations, this USAF guidance identifies child and elderly populations as sensitive receptors, and discusses the importance of

analyzing impacts on these populations because they have the potential to be more susceptible than other populations to certain environmental impacts and risks.

EO 12898 requires each federal agency to identify and address whether their proposed action results in disproportionately high and adverse environmental and health impacts on low income or minority populations. USEPA defines Environmental Justice to include the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no groups of people, including racial, ethnic, or socioeconomic groups, should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of federal, state, tribal, and local programs and policies.

EO 13045 states that each federal agency "(a) shall make it a high priority to identify and assess environmental health risks and safety risks that may disproportionately impact children; and (b) shall ensure that its policies, programs, activities, and standards address disproportionate risks to children that result from environmental health risks or safety risks." Activities occurring near areas that could have higher concentrations of children during any given time, such as schools and childcare facilities, might further intensify potential impacts on children. To the extent to which children might be impacted, disproportionate impact on children is inherent due to their inherent vulnerabilities.

Consideration of concerns related to environmental justice and other sensitive receptors includes the race, ethnicity, poverty status, and age of populations in the vicinity of a proposed action. Such information aids in evaluating whether a proposed action would render vulnerable any of the populations targeted for protection.

For the purposes of this SEIS, minority, low-income, child, and elderly populations are defined as follows:

- Minority Population: CEQ and USAF define minority populations as members of the following population groups: Black or African American, American Indian and Alaska Native, Asian, Native Hawaiian and Other Pacific Islander, and multi race that includes one of the aforementioned races; and Hispanic or Latino (CEQ 1997a, USAF 2014). The U.S. Census Bureau (USCB) considers race and Hispanic or Latino origin (ethnicity) as two separate concepts, and these data are recorded separately. However, the USCB collects race, ethnic, and Hispanic origin data differently in the Island Areas (i.e., CNMI) than on the U.S. mainland. Race and ethnic origin data for CNMI are collected together through one census question and, therefore, are presented as one subject in the Census data. Some of the single and combined ethnic origins/races identified by U.S. Census data are Native Hawaiian and Other Pacific Islander (Chamorro, Carolinian, Chuukese, Palauan), Asian (Filipino, Chinese, Korean), Hispanic or Latino, White, and two or more ethnic origins or races. There is no definition of minority populations that is specific to the CNMI. Therefore, this SEIS uses racial and ethnic categories to identify ethnicity of the CNMI population.

For the purposes of the environmental justice analysis, the total minority population will include main ethnic origin populations as identified in the 2016 CNMI HIES (CNMI Department of Commerce 2017a). However, data from the 2010 U.S. Census, the latest federal data available, also are presented in this section, where necessary, to supplement 2016 CNMI HIES data.

- Low-income Population: Low-income populations are defined as individuals whose income is below the federal poverty threshold based on income data. In 2015, the federal poverty threshold for an individual was $12,082 (USCB 2015).
- Child Population: Children are defined as all people 19 years of age and under.
- Elderly Population: Elderly persons are defined as all people 65 years of age and over.

The ROI for environmental justice and other sensitive receptors is the area within which potential impacts from a proposed action could occur. For this analysis, the ROI is Tinian with emphasis on areas within the surrounding community that are near the Proposed Actions (i.e., along the fuel pipeline and roadway improvement routes).

3.5.2 Existing Conditions

The CNMI, including Tinian, has a complex and dynamic ethnic history due to the influences of many cultures throughout its history and the in-migration of many foreign workers in recent history. Based on the federal definition of a minority, most of the Tinian population would be considered a minority. There is no regional or CNMI-specific definition of a minority; therefore, the federal definition is used in this analysis.

The 2016 CNMI HIES presents the main ethnic origin of the 2016 population of Tinian (see **Table 3.5-1**). These data are organized differently than the 2010 U.S. Census data, and do not allow for characterization of the minority population according to the federal definition. Therefore, they are presented here for informational purposes. The 2016 CNMI HIES data show similar patterns as the 2010 U.S. Census data in the 2016 Divert EIS (Final EIS, Section 3.14.4.2), with Chamorro and Filipino people representing the largest portions of the Tinian population.

Table 3.5-1. Main Ethnic Origin, 2016

Demographic	CNMI	Tinian
Total Population	53,890	3,056
Percent Main Ethnic Origin		
Chamorro	26.8%	36.7%
Carolinian	7.1%	0.8%
Federated States of Micronesia	7.0%	0.8%
Palauan	2.9%	0.5%
Chinese	5.1%	2.9%
Filipino	44.9%	47.1%
Other Asian	4.2%	7.7%
Other	2.1%	3.5%

Source: CNMI Department of Commerce 2017a

More than 50 percent of the population of Tinian was below the poverty level in 2015. According to the 2016 CNMI HIES, 54.3 percent of the population of Tinian were in poverty (CNMI Department of Commerce 2017a).

In 2016, the population of Tinian was relatively young; the median age was 33.3 years old. Persons 19 years old and younger accounted for more than one third of the population of Tinian (39.1 percent), while the population over 65 years old was small accounting for less than 5 percent of the populations (CNMI Department of Commerce 2017a).

3.6 Health and Safety

3.6.1 Definition of the Resource

A safe environment is one in which there is no, or an optimally reduced, potential for death, serious bodily injury or illness, or property damage. Health and safety addresses the well-being, safety, and health of contractors, USAF personnel, and members of the public during the various aspects of the Proposed Actions and alternatives.

Safety and accident hazards can often be identified and reduced or eliminated. Necessary elements for an accident-prone situation or environment include the presence of the hazard itself together with the exposed (and possibly susceptible) population. The degree of exposure depends primarily on the proximity of the hazard to the population. Activities that can be hazardous include construction, facility/infrastructure operation, maintenance and repair activities, and the creation of extremely noisy environments. The proper operation, maintenance, and repair of vehicles, equipment, and infrastructure (such as pipelines) can carry important safety implications. Extremely noisy environments can also mask verbal or mechanical warning signals such as sirens, bells, or horns. Refer to **Section 3.1** for information regarding noise. Additionally, areas where explosive or other rapid oxidation processes could occur create unsafe environments if not properly marked or managed.

OSHA and USEPA have the statutory responsibility to ensure the safety and health of the public and workforce within the United States and its territories (OSHA and USEPA 1991). OSHA regulations address the health and safety of people at work and cover potential exposure to a wide range of chemical, physical, and biological hazards and ergonomic stressors. The regulations are designed to control these hazards by eliminating exposure to the hazards via administrative or engineering controls, substitution, use of personal protective equipment (PPE), and availability of Safety Data Sheets. USEPA responsibilities include the protection of public health and the environment by assuring compliance with federal environmental statutes and regulations.

The CNMI Department of Labor has also developed regulations to protect the health and safety of contractors and recognizes OSHA regulations as the minimum safety standards for all employers. Chapter 80 of the Northern Mariana Islands Administrative Code includes requirements for employers, such as providing the appropriate safeguards to employees (e.g., PPE, safe walking and working surfaces, machine guarding), providing adequate drinking water supplies, and adopting any other necessary practices to adequately protect the health and safety of employees.

Contractor safety is largely a matter of adherence to regulatory requirements imposed for the benefit of employees and implementation of operational practices that reduce risks of illness, injury, death, and property damage. The health and safety of onsite USAF and civilian contractors are safeguarded by numerous DOD and USAF regulations designed to comply with standards issued by OSHA and USEPA, as well as Air Force Occupational Safety and Health (AFOSH) standards. These standards specify the amount and type of training required for industrial workers, the use of PPE and clothing, engineering controls, and maximum exposure limits for workplace stressors. In accordance with AFOSH standards, USAF would develop a project-specific health and safety plan.

The USAF safety program ensures the safety of personnel, contractors, and the public by regulating mission activities. AFI 91-202, *USAF Mishap Prevention Program*, implements Air Force Policy Directive 91-2, *Safety Programs*, and provides guidance for implementing the safety program during all USAF activities. To meet the goals of minimizing loss of USAF resources and protecting military personnel, mishap prevention programs address groups at increased risk for mishaps, injury, or illness; a process for tracking incidents; funding for safety programs; metrics for measuring performance; safety goals; and methods to identify safety best management practices (BMPs). This program ensures that all USAF workplaces meet federal safety and health requirements.

DOD has safety regulations that are applicable to the construction, operation, and maintenance of pipelines, fuel storage and dispensing systems, and petroleum facilities. These regulations include UFC 3-460-01 and UFC 3-460-03 described in **Section 2.2**. Additional applicable federal and DOD regulations are listed in **Appendix F**.

3.6.2 Existing Conditions

Contractor Health and Safety. All contractors are responsible for following federal and CNMI safety regulations and workers compensation programs. Construction and operations contractors are also required to conduct activities in a manner that does not pose an undue risk to construction or USAF personnel. Industrial hygiene programs address exposure to hazardous materials, use of PPE, and availability of Safety Data Sheets. Industrial hygiene is the responsibility of the contractors, as applicable. Contractor responsibilities are to review potentially hazardous workplace operations; to monitor exposure to workplace chemicals (e.g., hazardous materials, petroleum products), physical hazards (e.g., noise propagation, falls), biological agents (e.g., infectious waste, wildlife, poisonous plants), and ergonomic stressors; and to recommend and evaluate controls (e.g., prevention, administrative, engineering) to ensure personnel are property protected or unexposed. Contractors are also responsible for ensuring a medical surveillance program is in place to perform occupational health physicals for those personnel subject to the use of respiratory protection, engaged in hazardous waste work, or other work requiring medical monitoring.

In addition to CNMI and other federal requirements, contractors working on fuel pipelines are required to adhere to federal and DOD regulations specific to pipeline and pipeline infrastructure construction. The pipeline and support infrastructure operator is responsible for ensuring operations and maintenance activities are being conducted in accordance with applicable

federal and DOD regulations and that maintenance occurs when required (Pipeline101 2016). Contractors would also comply with the project-specific health and safety plan.

USAF Personnel Health and Safety. USAF personnel do not currently operate at Tinian International Airport or the seaport on a routine basis; however, USAF personnel will operate at the airport during Divert activities and at the seaport during fuel receipt and offload as proposed in the 2016 Divert EIS (Final EIS, Section 2.5.2). USAF personnel are required to adhere to all applicable federal and CNMI safety regulations.

Airfield Safety. Tinian International Airport has two Runway Protection Zones (RPZs), one at each end of the runway, which are to be kept clear of all aboveground objects and all facilities supporting incompatible activities. RPZs were established to enhance the protection of people and property on the ground under the flight approach zones (FAA 2012). The Tinian International Airport RPZs are trapezoidal and centered about the extended runway centerline at both ends. At 2,700 feet from the runway edge, the RPZ's width is 1,750 feet, and then narrows toward the runway edge (DON 2015a). The proposed West and East route project areas partially overlap with the western RPZ.

Explosive Safety. Unexploded ordnance (UXO) could be present within the proposed project areas due to the historic military use of Tinian during World War II. As described in **Section 3.11.2**, the occurrence of UXO is most likely to be discovered in heavily vegetated areas that have not been used for development since World War II and at the former World War II-era fuel tank farm that was east of TR25 to the south of Tinian International Airport (DON 2015a, USAF 2016a, CPA and FAA 1998).

Public Health and Safety. The CNMI DPS provides police, fire, and emergency medical services. As of 2014, the Tinian Division of the CNMI DPS was staffed by 21 police officers (a ratio of 6.9 officers for every 1,000 residents) and 11 firefighters (a ratio of 3.6 firefighters per 1,000 residents) (De La Torre 2018, DON 2015a). The ratios of police officers and firefighters per 1,000 residents on Tinian are more than double those of the U.S., which as of 2013 and 2015 had an average of 2.1 police officers and 1.5 firefighters per 1,000 residents, respectively (Bureau of Justice Statistics 2015, NFPA 2016). Therefore, Tinian public safety services are considered to have more than sufficient capacity to meet the needs of the public. Additionally, the CPA maintains firefighting capability at Tinian International Airport that is available to the Tinian Division of the CNMI DPS in the event of an emergency (DON 2015a).

The Tinian Health Center is the only medical facility on the island. The Health Center was recently expanded and improved and operates various sections, including: an emergency room, out-patient clinic, pharmacy, laboratory, and X ray and ultrasound unit. The Tinian Health Center is currently staffed by 31 personnel including one family nurse practitioner (the only medical provider present), four registered nurses, four licensed practical nurses, and one nursing assistant (CHCC 2018a). Despite the limitations and operational inefficiencies of medical care in remote areas with small populations such as Tinian (e.g., major emergency and specialty medical cannot be provided), the Health Center has not shown indications it is overburdened (DON 2015a, CHCC 2018a).

Tinian International Airport is listed as an evacuation safe zone as designated by the CNMI Emergency Management Office (CNMI HS&EM 2016). Additionally, the National Weather Service has recognized Tinian as "Tsunami Ready" because it has defined tsunami hazard zones; produced evacuation maps and installed evacuation route signs; supported ongoing, sustained tsunami public education and outreach (including to schools in tsunami hazard zones); established a 24-hour warning point; supported emergency operations center operations; established more than one way to receive tsunami warnings and to alert the public; established a formal tsunami operations plan; and held annual evacuation exercises (NWS undated a, NWS undated b).

3.7 Soils and Geology

3.7.1 Definition of the Resource

Geological resources consist of the Earth's surface and subsurface materials. Within a given physiographic province, these resources are typically described in terms of geology, physiography and topography, soils, and geologic hazards.

Geology is the study of the Earth's composition and provides information on the structure and configuration of surface and subsurface features. Such information derives from field analysis based on observations of the surface and borings to identify subsurface composition.

Physiography and topography pertain to the general shape and arrangement of a land surface, including its height and the position of its natural and human-made features.

Soils are the unconsolidated materials overlying bedrock or other parent material. Soils typically are described in terms of their complex type, slope, and physical characteristics. Differences among soil types in terms of their structure, elasticity, strength, shrink-swell potential, and erosion potential affect their abilities to support certain applications or uses. In appropriate cases, soil properties must be examined for their compatibility with particular construction or types of land use.

Important farmland is protected under the Farmland Protection Policy Act of 1981 and is defined as land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops, and is also available for these uses. The soil qualities, growing season, and moisture supply are needed for a well-managed soil to produce a sustained high yield of crops in an economic manner. The land could be cropland, pasture, rangeland, or other land, but not urban built-up land or water.

Geologic hazards are defined as natural geologic events that can endanger human lives and threaten property. Examples of geologic hazards include earthquakes, tsunamis, and landslides.

3.7.2 Existing Conditions

Regional Geology. Four major geologic units make up the island: Tinian Pyroclastic Rocks; Tagpochau Limestone; Mariana Limestone; and unconsolidated sediments consisting of beach deposits, alluvium, and colluvium (USGS 2002). The project areas overlay Mariana limestone.

Additionally, portions of the West route, East route, and roadway improvements would occur within an area of the beach deposits, alluvium, and colluvium at the seaport. Seaport support infrastructure would be constructed north of the beach deposits, alluvium, and colluvium area.

The project areas are also at or near Tinian's western coastline (see **Figure 2.4-1**). In the coastal regions of Tinian, Mariana limestone deposits are overlain by Holocene limestone, developing sands and gravels, and reefs (USGS 2002). Most of the shoreline on Tinian consists of limestone cliffs with sea-level caverns, cuts, notches, and slumped borders. Reef development occurs primarily on the western coast, with minor fringing or apron reef development on the northern, eastern, and southern coasts (DON 2010a). Additionally, limestone outcrops occur at or near the ground surface at the Tinian International Airport (USAF 2016a).

Physiography and Topography. The project areas are within the Central Plateau and Median Valley physiographic regions of Tinian. The Central Plateau is characterized by broad and gently sloping terrain that is isolated by the steep slopes and scarps at its southern and northern boundaries, which are associated with north-south trending faults. The Median Valley is a low, broad depression with little relief that is bounded by faults (University of Guam 2002, DON 2015a).

Topography at the Tinian International Airport (at the northern end of the West and East routes) is relatively flat with elevations ranging from approximately 60 to 100 feet above mean sea level (MSL) (DON 2010b, USGS 1999). Elevation surrounding the airstrip drops towards the ocean to the east and west. Between the airport and the seaport (where the West route, East route, and roadway improvements project areas are located), elevations range from approximately 20 feet above MSL near the seaport and shoreline to approximately 85 feet MSL to the north.

Topography at the seaport and within the seaport infrastructure project area ranges from less than 10 feet above MSL to approximately 30 feet above MSL (USGS 1999).

Soils. There are 18 soil classes present on Tinian and six (excluding fill land) covering 97.7 acres are present within the project areas (see **Table 3.7-1** and **Figure 3.7-1**). Fill land comprises approximately 3.3 acres of the West and East route project areas and 0.78-acre of the roadway improvements project area. No important farmland soils are within the proposed project areas; therefore, farmland soils are not discussed further.

The 2010 CNMI *Statewide Assessment and Resources Strategy Report* found that a majority of the soils along Tinian's western coastline are considered to be moderately to highly erodible (CNMI SWARS 2010). The locations of soil types with high erosion factors on Tinian are depicted by **Figure 3.7-1.** The only soil type with a high erosion factor within the project areas is the Chinen-Rock Outcrop Complex, 15 to 30 percent slopes present within the West and East route project areas.

Table 3.7-1. Characteristics of Soils Mapped in the Project Areas on Tinian

Soil Class Mapping Unit	Texture	Erosion Hazard*	Location (acres within project area)	Characteristics
Chinen-Urban Land	Urban land	Slight to moderate	West route (11.2 acres), East route (12.2 acres), roadway improvements (0.92 acre)	Shallow, well-drained, nearly level soils and urban areas
Chinen	Clay loam, very gravelly sandy loam	Slight to moderate	West route (22.2 acres), East route (23.0 acres), roadway improvements (3.2 acres)	Shallow to moderately deep, well-drained, nearly level to strongly sloping soils
Chinen-Rock Outcrop	Clay loam, rock	Moderate to severe	West route (6.2 acres), East route (7.5 acres), roadway improvements (0.52 acre)	Shallow, well-drained, nearly level to strongly sloping soils and rock outcrop; on limestone escarpments and plateaus
Dandan-Chinen	Clay loam, clay	Slight to moderate	West route (6.2 acres), East route (13.6 acres), roadway improvements (3.1 acres)	Shallow to moderately deep, well drained, nearly level to strongly sloping soils
Takpochao-Rock Outcrop	Rock	Slight	East route (0.04 acres)	Very shallow, well-drained, nearly level to strongly sloping soils and rock outcrop; on limestone escarpments and plateaus
Shioya	Loamy sand	Slight	West route (9.4 acres), East route (9.4 acres), seaport (8.2 acres), roadway improvements (0.70 acre)	Very deep, excessively drained, level to nearly level soils

Sources: USDA NRCS 1989, DON 2010b, USDA NRCS 2018

*Erosion hazard range is provided when multiple soil types are present within a soil class. Typically, the greater the slope, the greater the erosion hazard.

Geologic Hazards. Geologic hazards on Tinian include earthquakes, tsunamis, landslides, liquefaction, and karst features (e.g., sinkholes). Earthquakes are common in the CNMI and seismic activity in the region is a result of the subduction of the Pacific Plate beneath the Philippine Plate (CRMO 2011, USGS 2012). Earthquakes with a magnitude range of 6 to 7 occur on average once every 10 years, and earthquakes with a magnitude greater than 7 occur on average once every 100 years (Lander et al. 2002, DON 2010b). Due to the frequency of seismic activity, CNMI Building Safety Code Rules and Regulations have previously identified CNMI to be within Seismic Zone 4 (CNMI 2017). However, the International Building Code adopted by all U.S. states and territories has replaced seismic zones with contour maps that provide a refined representation of potential seismic ground shaking in a given location with a consistent return period. The contour maps provide spectral response acceleration parameters that are used to determine seismic forces. The seismic parameters for the project area that have been provided by the U.S. Geological Survey as listed in UFC 3-301-01 *Structural Engineering* are short period spectral acceleration of 1.78; and long period spectral acceleration of 0.45. The proposed West route, East route, and roadway improvements project areas may partially coincide with fault lines.

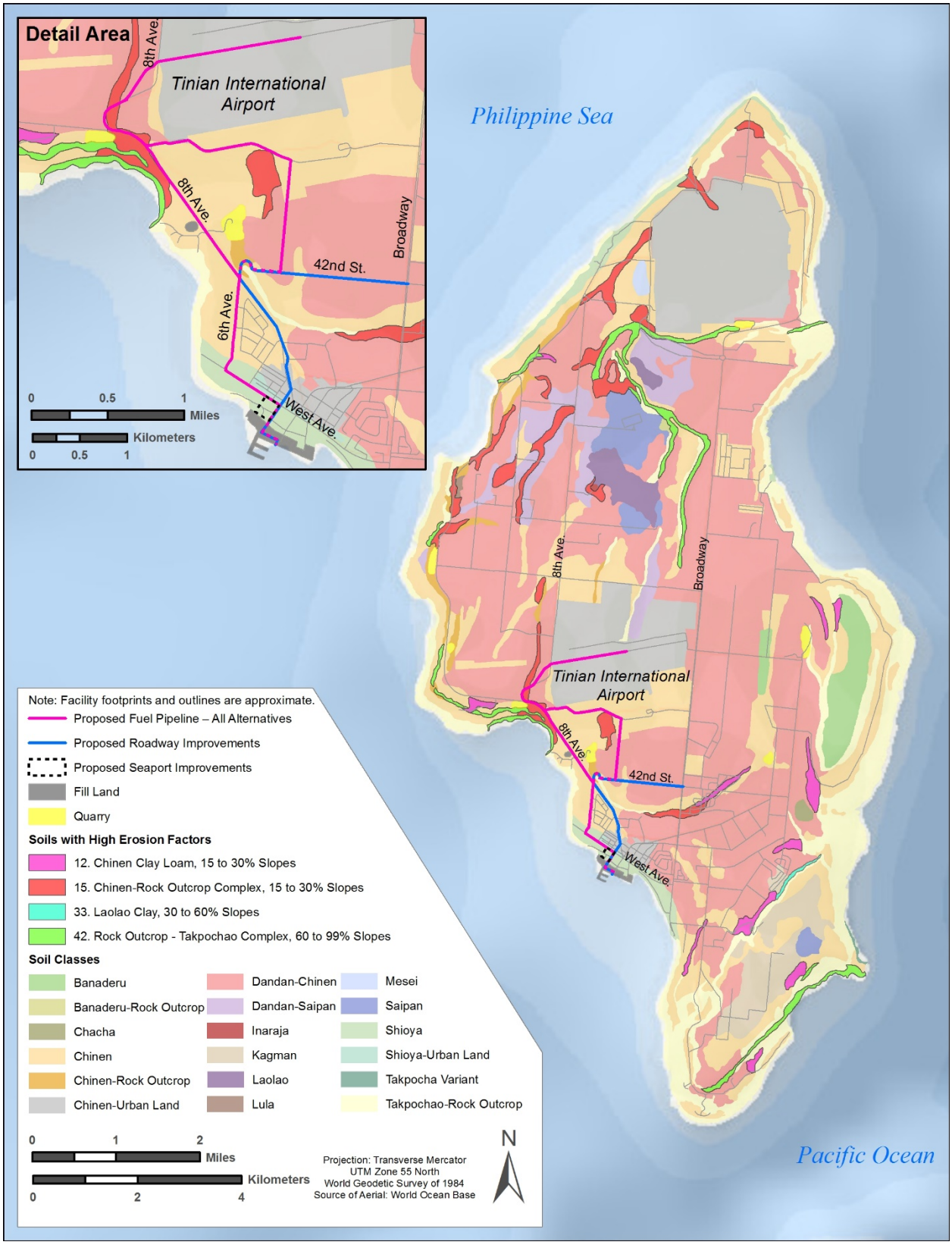


Figure 3.7-1. Tinian Soils Classes and Soils with High Erosion Factors

Large earthquakes originating in the Mariana Trench and other nearby Pacific subduction zones pose a tsunami threat to the CNMI. The proposed seaport support infrastructure project area is within a potential tsunami affected area on Tinian's west coast, and the West route, East route, and roadway improvements project areas partially overlap with the potential tsunami affected area (TDPL 2017).

The likelihood for landslides to occur on Tinian is generally low because the consolidated nature of the limestone units reduce the potential for slope failure (DON 2010b). Tinian does not have a Hazard Mitigation Plan; however, a plan for Guam determined slopes with an angle of 30 percent or more are considered to have a moderate to high potential for a landslide to occur and slopes of less than 5 percent are considered to have a low potential for a landslide to occur regardless of the geologic deposits present (Guam 2014). The West route project area partially coincides with an area of steep slopes associated with the western coastline. The East route, seaport support infrastructure, and roadway improvements project areas do not contain steep slopes.

Typically, liquefaction occurs in areas where there are loose soils with poor drainage (WWU undated, DON 2015a). On Tinian, these conditions could be present on fill land located near the coast; however, the consolidated limestone geologic units on Tinian are not usually susceptible to liquefaction (WWU undated, DON 2015a, USAF 2016a).

Karst topography exists on Tinian due to the presence of limestone on the island. No karst features were detected during site investigations for the 2016 Divert EIS on Tinian (Final EIS, Section 3.4.2.2), and karst features identified during geologic investigations by Gingerich and Yeatts in 2000 do not overlap the project areas (University of Guam 2002).

3.8 Water

3.8.1 Definition of the Resource

Water resources include groundwater, surface water, wetlands, floodplains, and their relationship to the area of a proposed action. These resources are described in terms of occurrence, distribution, movement, and properties through the processes of precipitation, subsurface flow, evapotranspiration, and surface runoff.

Groundwater. Groundwater is water that collects or flows beneath the earth's surface within aquifers. On Tinian, groundwater forms a lens-shaped freshwater body called a freshwater lens, floating on denser seawater within the aquifer. Groundwater is described in terms of depth from the surface, aquifer or well capacity, quality, recharge rate, and surrounding geologic formations.

The Safe Drinking Water Act (SDWA) of 1974 establishes a federal program to monitor and increase the safety of all commercially and publicly supplied drinking water. The 1986 amendments to the SDWA required USEPA to establish maximum contaminant levels, maximum contaminant level goals, and best available technology treatment techniques for organic, inorganic, radioactive, and microbial contaminants; and turbidity in drinking water sources.

The Federal Sole Source Aquifer regulations authorized under the SDWA protect aquifers that are critical to water supply. USEPA defines a Sole Source Aquifer as one that supplies at least 50 percent of the drinking water consumed in the area overlying the aquifer. These areas tend to have no alternative drinking water sources that could physically, legally, or economically supply those who depend upon the aquifer for drinking water.

Surface and Coastal Waters. Surface water includes natural, modified, and constructed water confinement and conveyance features. These features are generally classified as streams, springs, lakes, wetlands, natural and artificial impoundments (e.g., ponds), and constructed drainage canals and ditches. Surface water systems are typically defined in terms of watersheds. A watershed is a land area bounded by topography that drains water to a common destination. On Tinian, this destination is eventually coastal waters. Coastal waters are waters that are adjacent to the shorelines that contain a measurable quantity or percentage of seawater, including, but not limited to, sounds, bays, lagoons, bayous, ponds, and estuaries. Watersheds divide the landscape into hydrologically defined areas, and serve to drain, capture, filter, and store water and determine its subsequent release. Stormwater is surface water generated by precipitation events that may percolate into permeable soils or runoff, which occurs when the stormwater flows across the top of impervious or saturated surficial areas.

The CWA (33 USC § 1251 *et. seq*., as amended) establishes federal limits, through the National Pollutant Discharge Elimination System (NPDES), on the amounts of specific pollutants that are discharged to waters of the United States. to restore and maintain the chemical, physical, and biological integrity of the water.

Section 402 of the CWA forbids the discharge of pollutants from a point source into navigable waters without an NPDES permit. The NPDES stormwater program requires construction site operators engaged in clearing, grading, and excavating activities that disturb 1 acre or more to obtain coverage under an NPDES permit for their stormwater discharges. NPDES permits in the CNMI are issued by USEPA Region 9. Construction stormwater discharges are permitted under USEPA's Construction General Permit (CGP), which requires compliance with effluent limits and development of a site-specific Storm Water Pollution Prevention Plan (SWPPP). USEPA published the technology-based Final Effluent Limitations Guidelines and the "Construction and Development Rule" to control the discharge of pollutants from construction sites. The Construction and Development Rule requires construction site operators to meet erosion and sediment control, pollution prevention, and stabilization requirements. USEPA currently regulates large and small (greater than 1 acre) construction activities through the final 2017 CGP. NPDES industrial stormwater permit requirements would be followed as determined by USEPA Region 9. Sections 404 and 401 (through water quality certification) of the CWA regulate the discharge of dredged or fill materials into the waters of the United States. The CNMI Bureau of Environmental and Coastal Quality (BECQ) is the administrative authority for CWA Section 401 Water Quality Certifications required for validation of NPDES permits.

Section 303(d) of the CWA requires states to identify and develop a list of impaired water bodies where technology based and other required controls have not provided attainment of water quality standards. Section 305(b) of the CWA requires states to assess and report the quality of their water bodies. States and territories, including the CNMI, combine their list of impaired

waters, required by Section 303(d) of the CWA, within their 305(b) report as an Integrated Report. The Integrated Report identifies those water bodies that are impaired and do not meet designated uses, and it establishes total maximum daily loads for the pollutants of concern (CNMI BECQ 2018).

Section 438 of the Energy Independence and Security Act (EISA) (42 USC § 17094) establishes stormwater design requirements for federal construction projects that disturb a footprint greater than 5,000 square feet of land. Under these requirements, predevelopment site hydrology must be maintained or restored to the maximum extent technically feasible with respect to temperature, rate, volume, and duration of flow. Additional guidance is provided in the USEPA *Technical Guidance on Implementing the Storm Water Runoff Requirements for Federal Projects under Section 438 of the Energy Independence and Security Act*.

The CNMI BECQ also developed its own Water Quality Standards, which are promulgated in accordance with the Federal CWA, the Commonwealth Environmental Protection Act of 1982 (2 Commonwealth Code §§ 3101–3134, P.L. 3-23), the Commonwealth Environmental Amendments Act of 1999 (P.L. 11-103), and the Commonwealth Groundwater Management and Protection Act of 1988 (2 Commonwealth Code §§ 3311–3333, P.L. 6-12). The CNMI Water Quality Standards define two classes (AA and A) of marine water uses. The majority of the coastal marine waters are Class AA, meaning that these waters should remain in their natural pristine state as nearly as possible with an absolute minimum of pollution or alteration of water quality from any human source or actions. The uses protected in these waters are the support and propagation of marine life, conservation of coral reefs and wilderness areas, oceanographic research, and aesthetic enjoyment and compatible recreation inclusive of whole body contact and related activities. Class A waters are protected for their recreational use and aesthetic enjoyment; other uses are allowed as long as they are compatible with the protection and propagation of fish, shellfish, and wildlife, and recreation in and on the water is of a limited body contact nature.

Per the Northern Mariana Islands Administrative Code Chapter 65-30, Earthmoving and Erosion Control Regulations, no person shall commence or continue grading, filling, or vegetation-clearing activities without first obtaining a permit from the CNMI BECQ. The CNMI BECQ in coordination with the Guam Environmental Protection Agency (GEPA) developed a guidance manual in 2006 to assist the local engineering and development communities and local government agencies of Guam and CNMI in developing and implementing stormwater- and erosion-control plans that adequately address nonpoint source pollution through the use of currently accepted BMPs. Volume I of the *Storm Water Management Manual* provides designers a general overview of local stormwater issues, lists the stormwater performance standards for the islands, and describes how to size and design BMPs to comply with those standards. Volume II of the Manual contains more detailed information on how to select, site, and construct BMP specifications (CNMI BECQ and GEPA 2006).

Wetlands. Wetlands generally include swamps, marshes, bogs, and similar areas (33 CFR § 328). The U.S. Army Corps of Engineers (USACE) defines wetlands as “those areas that are inundated or saturated with ground or surface water at a frequency and duration

sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted to life in saturated soil conditions."

Section 404 of the CWA authorizes USACE to issue permits for the discharge of dredged or fill materials into the waters of the United States, including wetlands. In addition, Section 404 of the CWA also grants states with sufficient resources the right to assume these responsibilities. Section 401 of the CWA gives the state board and regional boards the authority to regulate through water quality certification any proposed federally permitted activity that could result in a discharge to water bodies, including wetlands.

EO 11990, *Protection of Wetlands*, requires that federal agencies provide leadership and take actions to minimize or avoid the destruction, loss, or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands. Federal agencies are to avoid new construction in wetlands, unless the agency finds there is no practicable alternative to construction in the wetland and the proposed construction incorporates all possible measures to limit harm to the wetland.

Floodplains. Floodplains are areas of low-level ground present along rivers, stream channels, or coastal waters that are subject to periodic or infrequent inundation from rainfall. Risk of flooding typically depends on local topography, the frequency of precipitation events, and the size of the watershed above the floodplain. Flood potential is evaluated by the Federal Emergency Management Agency (FEMA), which defines the 100-year floodplain as an area that has a 1 percent chance of inundation by a flood event in a given year.

EO 11988, *Floodplain Management*, requires federal agencies to determine whether a proposed action would occur within a floodplain. This determination typically involves consultation of FEMA Flood Insurance Rate Maps (FIRMs), which contain enough general information to determine the relationship of the project areas to nearby floodplains.

3.8.2 Existing Conditions

Groundwater. The main source of freshwater on Tinian is groundwater from a basal freshwater lens within an aquifer composed of high-permeability coralline limestone (Takpochao Limestone) overlying low-permeability volcanic rock (Gingerich 2002). The basal fresh water lens extends from 2 to 4 feet MSL to approximately 80 to 160 feet below sea level at its deepest point (DON 2010c). Elevations of the water table in the project areas range from 0.4 feet MSL at the proposed seaport and West route to 1.2 feet MSL along the East route and at Tinian International Airport. Groundwater flows radially from the center of the island to coastal discharge zones (see **Figure 3.8-1**).

All fresh groundwater on Tinian originates as precipitation, mainly rainfall. The rain either runs off, evaporates or is transpired by vegetation, or recharges the groundwater system. Approximately 7 percent of the annual rainfall becomes runoff, approximately 56 percent is evapotranspirated, and approximately 37 percent recharges the groundwater. Tinian receives approximately 80 inches of annual rainfall with a distinct wet season (July through September) and dry season (February through March) (CNMI BECQ and GEPA 2006).

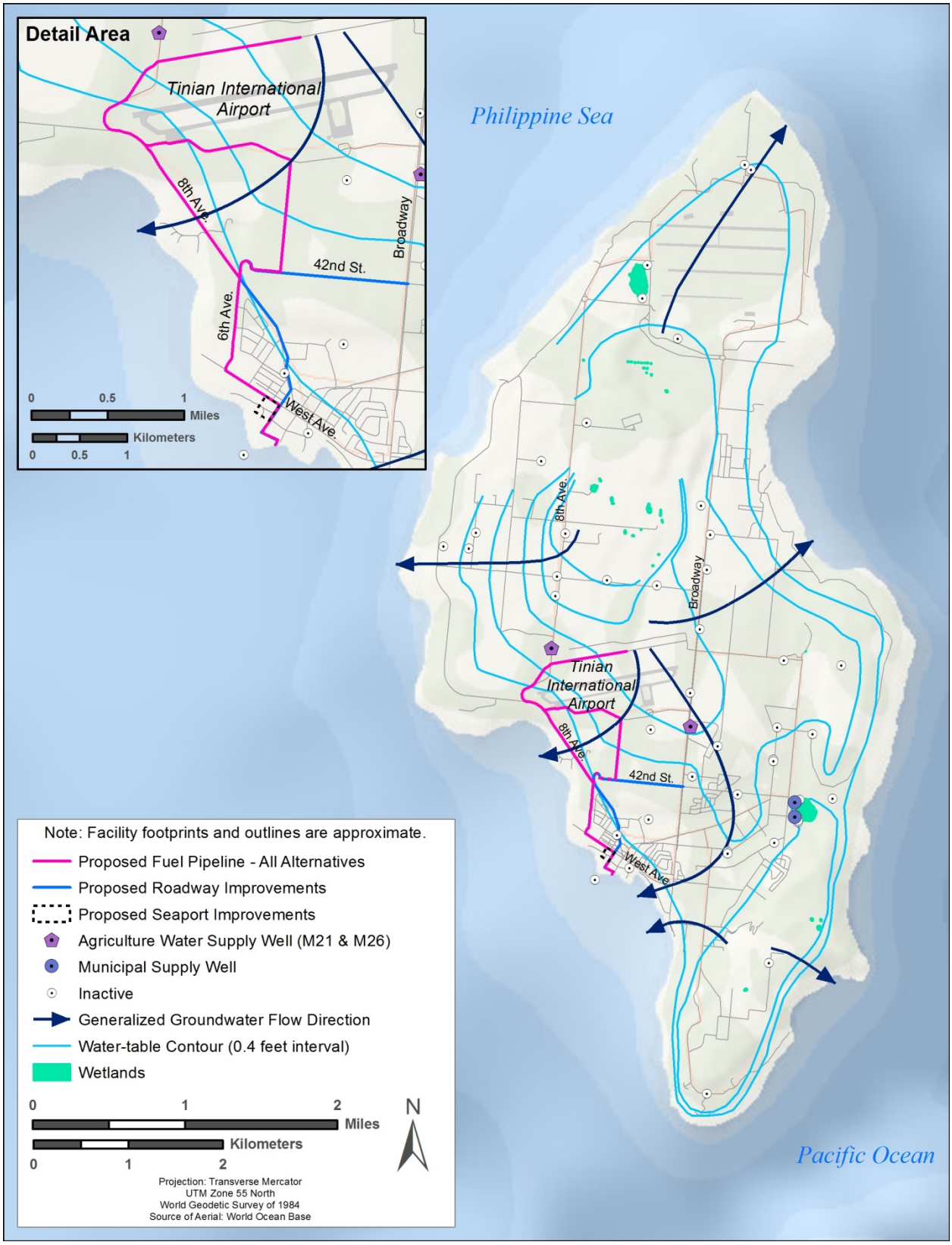


Figure 3.8-1. Water Map of Tinian

Existing groundwater resources may be capable of supplying up to 7 million gallons per day (gpd) of potable fresh water (USAF 2016a). Water is withdrawn from the Makpo aquifer at a maui-type well located east of San Jose village (CPA and FAA 1998). From 1990 to 1997, groundwater withdrawal from this municipal well, the major source of water, averaged approximately 780 gpm, or approximately 1.1 million gpd (Gingerich 2002). No sole source aquifer is designated on the island (CPA and FAA 1998).

Surface Water and Coastal Waters. There are no perennial or intermittent streams on Tinian. Drainage throughout most of Tinian is underground and water generally percolates downward into porous limestone rock.

The seaport is in the Makpo Harbor Sub-watershed (Segment 9H), and is Tinian's only designated Class A waters. These waters do not support use by aquatic life due to low dissolved oxygen levels and poor aquatic habitat. In the 2018 Integrated Report, water quality levels for Segment 9H fell within CNMI water quality standards for Enterococci, resulting in these waters being removed from the 303(d) list as impaired for Enterococci, and now capable of supporting recreational use (CNMI BECQ 2018).

Tinian International Airport spans across the Puntan Daiplolamanibot Watershed, which drains west into the Philippine Sea and the Masalok Watershed, which drains northeast into the Pacific Ocean (CNMI BECQ 2018). The coastal waters of the Puntan Daiplolamanibot and Masalok watersheds are impaired (Category 5) and are not attaining recreational use because of Enterococci. Aquatic habitat is ranked as "fair" at Puntan Daiplolamanibot and "good" at Masalok (CNMI BECQ 2018). A stormwater retention area is in place at the west end of the Tinian International Airport runway. Stormwater drainage ditches and swales direct water off the runway and airfield into the stormwater retention area and the large, excavated depressions in between the runway and taxiway.

Coastal waters surrounding Tinian serve as the discharge areas for all surface runoff from the island. As stated above, CNMI coastal waters are divided into Class A and Class AA waters by CNMI DEQ. The coastal waters of the Puntan Daiplolamanibot and Masalok watersheds are designated as Class AA marine waters. The coastal waters of the Makpo Watershed, the location of the proposed seaport, are designated as Class A marine waters, which are designated for recreational purposes and aesthetic enjoyment and are to be protected for these uses (CNMI BECQ 2018).

Wetlands. Wetland habitats on Tinian are typically discrete areas of impermeable clay that impound rainwater. In periods of drought, the water level in these wetlands drops and open water dramatically decreases. The largest wetland area on Tinian, Hagoi Lake (36 acres) in the northern lowland is supplied perennially by groundwater. Wetlands in the Puntan/Diaplolamanibot watershed, the Bateha I and II Complex are isolated palustrine emergent wetlands (DON 2015a). Other Tinian wetlands are considered ephemeral because they are not large enough to sustain during periods of low rainfall. The Makpo wetland once supported open water, but municipal groundwater pumping significantly altered the water levels (DON 2010b).

During surveys conducted May 12 to 16, 2018, biologists searched the project areas for open water, wetlands, and drainages. No ponds, streams, wetlands, or other water were found, and no drainages or other features that might be regulated under Section 404 of the CWA were identified. The closest wetland to the project areas is approximately 1 mile away from the proposed pipeline routes.

Flood Zones. According to FEMA FIRM Panel Number 750001 0040 B (effective date May 15, 1991), three areas designated as Flood Zone A occur near the Tinian International Airport (FEMA 1991). These flood zones are areas with a 1 percent annual chance of flooding. Because they are not associated with floodplains of surface water bodies, these flood zones are not protected under EO 11988, *Floodplain Management*. These flood zones are associated with depressions created by former excavation activities and are only considered flood zones because of their potential to hold water during heavy rain events.

3.9 Infrastructure and Transportation

3.9.1 Definition of the Resource

Infrastructure consists of the systems and physical structures that enable a population in a specified area to function. Infrastructure is wholly human-made, with a high correlation between the type and extent of infrastructure and the degree to which an area is characterized as "urban" or developed. The availability of infrastructure and its capacity for expansion are generally regarded as essential to the economic growth of an area. The infrastructure components discussed in this section include airfield, seaport, utilities, solid waste management, and transportation.

The airfield encompasses all pavements, runways, taxiways, overruns, aprons, cargo pads, navigational aids, hangars, and facilities and equipment that are associated with aircraft maintenance and aircraft operations. The seaport area includes berthing space and yard area. Utilities include electrical supply, liquid fuel supply, water supply, stormwater drainage, and sanitary sewer systems. Solid waste management primarily relates to the availability of systems and landfills to support a population's residential, commercial, and industrial needs. The infrastructure information contained in this section provides a brief overview of each infrastructure component and comments on its existing general condition.

This section also describes the existing roadway facilities that serve the island of Tinian. The CNMI Comprehensive Highway Master Plan was used to identify the existing conditions of the roadway network potentially impacted by the Proposed Actions.

3.9.2 Existing Conditions

***Airfield*.** The Tinian International Airport airfield is currently designed to accommodate aircraft up to the size and dimensions of a 747. The main component of the airfield, runway 8/26 is 8,600 feet long, 150 feet wide, and has two 25-foot-wide paved shoulders. It is grooved for flight safety and drainage purposes (AFCEE/PACAF 2010).

Seaport. The main wharf at the Port of Tinian has a useable length of approximately 1,600 feet long with depths between 24 and 29 feet. It is used to moor commercial barges operating

between Tinian and Saipan. There are two piers (Pier 1 and Pier 2) on the southwest of the main wharf, both of which are in poor condition. A mooring buoy 2 miles from Tinian Harbor was removed; however, the anchoring system is still useable for large draft ships. A tugboat and lightering barge (used to transport cargo from larger draft vessels incapable of entering the harbor) are available for use, as needed (DON 2015a).

The current harbor infrastructure is in need of improvements and repairs but previously underwent emergent repairs to include the sea wall, bollards, and fenders and therefore continues to support shipping vessels. According to the Tinian Harbor Master Plan, the current usable depth of the Tinian Harbor is approximately 27 feet by some accounts (Tenorio and Dashiell 1997).

The Port of Tinian receives, stores, and issues diesel and unleaded gasoline, but has no aviation fuel capacity.

***Electrical Supply*.** The electrical infrastructure at Tinian is capable of satisfying considerably more demand than the current base and peak loads with a maximum electrical capacity of approximately 20 megawatts (MW) (DOD 2019) and could be expanded to 30 MW because the island's power plant was built during a period of high resort development interest. The energy infrastructure is also in good condition and well-maintained. Tinian has a current peak load of 1 MW, with a demand of 500,000 kilowatt-hours per month and additional capacity via a standby generator kept in reserve (DOD 2019). This allows for peak demand to be met when one of the two largest 5-MW generators is down for maintenance (DON 2015a). Distribution is through four 13.8-kilovolt feeders, one of which is dedicated solely to the U.S. Government International Broadcasting Bureau (IBB) (CNMI 2011; DON 2015a). The primary IBB distribution line runs above ground on poles from the generation facility to the IBB along TR25. Many of the distribution lines and utility poles were damaged or downed during Typhoon Yutu in October 2018 but are being gradually replaced.

About 50 percent of Tinian's power consumption was previously from two customers: Tinian Dynasty Hotel and Casino and the IBB. However, the Tinian Dynasty has closed and therefore IBB is the main source of power consumption on the island. The airport is a smaller, yet still considerable consumer of power (CNMI 2011). A substantial amount of energy is required to pump and treat water for potable use, and to collect, pump, and treat wastewater on Tinian (CNMI 2011).

Tinian International Airport is connected to the existing power system; however, it has a highly limited feeder distribution network (CNMI 2011). An electrical line runs on the east end of the airport property but does not extend throughout the entire Tinian International Airport property (AFCEE/PACAF 2010).

***Liquid Fuel Supply*.** Currently, Tinian International Airport has limited capacity for the receipt, storage, and distribution of aviation fuel. The airfield has no A1 jet fuel infrastructure. Current aviation fuel inadequacies of Tinian include the following:

- No capability for Jet A1 fuel supply or storage on Tinian
- No fuel hydrant system on the airfield

- No fuel trucks capable of servicing aircraft on Tinian

The Port of Tinian can support limited cargo ships and the main wharf can support up to 4,500 tons of cargo per day (AFCEE/PACAF 2010, DON 2010a). Fuel storage at the seaport includes a 12,000-bbl (500,000-gallon) diesel aboveground storage tank (AST) and a 1,500-bbl (63,000-gallon) unleaded gasoline AST. The seaport has no aviation fuel storage capability (AFCEE/PACAF 2010).

***Water Supply*.** Potable water on Tinian is primarily withdrawn from groundwater wells; however, some households use catchment basins (CNMI 2011, AFCEE/PACAF 2010). Most of the agricultural and domestic water supply originates in the Makpo wetland area and is collected in storage tanks at Marpo Heights and Carolina Heights (DON 2010a). The water system uses four water storage tanks. The Tinian Airport Tank is a 60,000-gallon tank along the airport access road that serves the airport and its associated facilities. The Marpo Tank is a 250,000-gallon tank that serves the Marpo Valley agricultural area and Marpo Heights residential area. A 500,000-gallon tank is sited above the Carolinas residential area that serves the Carolinas Heights subdivision, San Jose, Carolinas Heights Agricultural Homesteads, and a portion of Marpo Valley (DON 2015a). The fourth tank is also 500,000 gallons and was constructed in 2017 adjacent to the Carolinas tank; this tank was constructed to provide the capability for maintenance of the existing 500,000 gallon reservoir without interrupting water services to the residents of Tinian (Marianas Variety 2016).

From 1945 to 1999, all municipal water was supplied by the Municipal Well (a 300-foot-long horizontal trench). In 1999, two vertical wells (i.e., TH04 and TH06) were added to the system. By 2001, a new 400-foot-long infiltration gallery replaced the Municipal Well in a nearby location. Pumps are generally operated 24 hours per day, except during maintenance and low demand in the rainy season. Withdrawals have fluctuated less than 10 percent throughout the years. The new infiltration gallery can supply approximately 875 gpm. Well TH06 produces approximately 60 gpm and well TH04 is capable of producing 50 gpm; however, they are generally only used to maintain pressure in the distribution system during peak demand hours (Gingerich 2002). In October 2018, Typhoon Yutu damaged the supply well distribution system, including damage to the main water tank. A new municipal water well was installed near the former well during the typhoon relief efforts; however, the exact location of the new well is unknown and the roof of the main water tank had not been repaired as of June 2019 (DOD 2019). However, there was no damage to the integrity of the water tank and repair of the roof is being managed by CNMI. Based on the available withdrawal data, Tinian is capable of producing approximately 1,260,000 gpd of water.

In 2013, there were 833 metered accounts for residential, commercial, and government customers on Tinian. Between October 2011 and August 2014, the island was estimated to use approximately 320,000 gpd with a loss of approximately 787,000 gpd; the Commonwealth Utilities Corporation (CUC) estimates that this loss is approximately 75 to 80 percent of CNMI's potable water supply (DON 2015a).

The Tinian International Airport relies on the CUC for water; however, the airport has its own local water distribution system. The IBB is not connected to the CUC and uses non-potable rainwater collection, non-potable bulk water trucked from the CUC, and bottled drinking water.

Stormwater. There is limited information on the stormwater infrastructure on Tinian. Most of the precipitation on Tinian either runs off, evaporates, or percolates into the limestone substrata. During periods of intense rainfall, approximately 7 percent of total rainfall becomes runoff that flows towards the low-lying coastal areas. Tinian International Airport is surrounded by pervious soil with vegetation. Stormwater at Tinian International Airport is handled by open drainage ditches and sheet flow overland to lower elevations and the land has been graded to accommodate runoff. Grading included incorporation of detention basins north of and between the airstrips, and a drainage swale south of the airstrips. A stormwater culvert transports runoff from the drainage swale south of the airstrip to an area southwest of the airstrip and outside the airport fence line (DOD 2019). Stormwater at the seaport area sheet flows to the coastline, except for the areas around the ASTs, which have secondary containment systems. See **Section 3.8** for additional information on stormwater.

Sanitary Sewer and Wastewater Treatment. There are no permitted wastewater processing facilities on Tinian (CNMI Department of Commerce 2009). Residents and businesses on Tinian, including Tinian International Airport, use septic systems and leach fields for wastewater treatment (CNMI 2011). A U.S. military septic tank and leaching field system south of the IBB perimeter fence was previously certified for use for a population of 2,500 military training personnel with an average daily flow of 6,640 gpd. From May 2012 to February 2014, CNMI BECQ allowed the use of this septic tank and leaching field for military training as there was no other option available and the leaching field appeared to be draining. However, as of April 2014, CNMI BECQ has not allowed the use of the system until rehabilitation of the leaching field is completed (DON 2015a).

Solid Waste. Currently, solid waste on Tinian is disposed of at the open landfill adjacent to TR25, recycled at the Tinian recycling center, or transported to Saipan for disposal. In November 2006, the Mayor of Tinian declared a “state of disaster emergency” due to the failure to close Tinian’s unsafe dumpsite (i.e., Tinian landfill). On January 20, 2010, CNMI BECQ issued an administrative order to the CNMI Department of Public Works and the Mayor’s Office of Tinian for failure to comply with landfill operating requirements at the municipal dump. BECQ stated that the office’s “non-compliance posed a threat to human health and the environment.” The municipal dump received violations for air quality regulations for the open burning of solid wastes. They also failed to cover exposed solid waste at the end of each operating day, control disease carriers, implement a waste exclusion plan to prevent receiving hazardous wastes and polychlorinated biphenyl wastes, have trained operators, and have control of public access to prevent unauthorized disposal within and outside the dump (Saipan Tribune 2010). A new sanitary transfer station has opened on Tinian and a new solid waste facility is planned; however, it has not opened as of January 2019.

Transportation. Tinian’s roadway system consists of approximately 70 miles of two-lane undivided roadways on the Territorial Highway System (CNMI DPW undated; DON 2015a). A majority of Tinian roadways were paved during and shortly after World War II under U.S. Navy Administration (USDOI-OIA 1999). Key roadways on Tinian are described in **Table 3.9-1** and shown in **Figure 2.2-3**. **Table 3.9-1** includes average daily traffic (ADT) volumes and level of service (LOS). LOS is a measure of vehicle carrying capacity and is the standard used to evaluate traffic conditions at intersections and interchanges. All of the roadways currently

operate at LOS A. Traffic volume on all other roads, including those in the Military Lease Area and Port of Tinian, is well below 500 daily trips (DON 2015a). No intersections on Tinian were analyzed in the CNMI Comprehensive Highway Master Plan. Roadway pavement conditions tend to be poor as a result of drainage issues and the use of coral and acidic-base pavement materials (CNMI DPW 2009).

Table 3.9-1. Year 2008 Existing Conditions: Key Tinian Roadways

Roadway	ADT Volume	Level of Service
TR21	390–1,470	A
TR24	150	A
TR25	180–300	A

Source: CNMI DPW 2009

In addition to existing conditions, the CNMI Comprehensive Highway Master Plan includes projected ADT volumes and associated future traffic operations (assuming no improvements) for 2022. **Table 3.9-2** shows the future conditions of key roadways on Tinian. Based on the predicted future LOS, the CNMI Comprehensive Highway Master Plan also provides improvement recommendations for several roadways; however, no improvements were identified for the key roadways in **Table 3.9-2**.

Table 3.9-2. Year 2022 Future Conditions: Key Tinian Roadways

Roadway	ADT Volume	Level of Service
TR21	500–1,880	A
TR24	190	A
TR25	230–380	A

Source: CNMI DPW 2009

3.10 Land Use and Recreation

3.10.1 Definition of the Resource

Land Use. Land use refers to real property classifications that indicate either natural conditions or the types of human activity occurring on a parcel. In many cases, land use descriptions are codified in local zoning laws. However, there is no nationally recognized convention or uniform terminology for describing land use categories.

Two main objectives of land use planning are to ensure orderly growth and compatible uses among adjacent property parcels or areas. In appropriate cases, the location and extent of a proposed action is evaluated for its potential effects on a project site and adjacent existing land uses. The foremost factor affecting a proposed action in terms of land use is its compliance with any applicable land use or zoning regulations. Other relevant factors include matters such as existing land use at the project site, the types of land uses on adjacent properties and their proximity to a proposed action, the duration of a proposed activity, and its "permanence."

Coastal Zone and Submerged Lands. The CZMA was promulgated in 1972 as a means to "…preserve, protect, develop, and where possible, to restore or enhance, the resources of the Nation's coastal zones for this and succeeding generations [through] the development and

implementation of management programs to achieve wise use of the land and water resources of the coastal zone, giving full consideration to ecological, cultural, historic, and aesthetic values, as well as the needs for compatible economic development…" (16 USC §§ 1451–1466). The CZMA is administered through local programs designed in cooperation with the federal government.

Federal consistency requirements of the CZMA require that federal activities comply to the greatest extent possible with the enforceable policies of applicable local coastal zone management programs. Non-federal activities must comply fully with local management programs if they require a federal permit or license, or if they receive federal funding (15 CFR § 930). Land and submerged lands under federal jurisdiction are excluded from the territorial coastal zone. According to the CZMA, federal activities that affect any land or submerged land use or natural resource of a territory's coastal zone shall be carried out in a manner that is consistent to the maximum extent practicable with the enforcement policies of the federally approved territorial Coastal Zone Management Program.

Recreation. Recreation refers to natural and human made lands designated by planning entities to offer visitors and residents diverse opportunities to enjoy leisure activities. Recreational resources are places or amenities set aside as parklands, beaches, trails, recreational fields, sport or recreational venues, open spaces, open waters, and aesthetically pleasing landscapes along with a variety of other uses. Federal, commonwealth, and local jurisdictions typically have designated land areas with defined boundaries for recreation. Other less structured activities (e.g., fishing) are performed in broad, less defined locales. A recreational setting might consist of natural or human made landscapes and can vary in size from a roadside monument to a designated sport area to a wilderness area. For the purpose of this analysis, recreational activities include any type of outdoor activity in which area residents, visitors, or tourists could participate and pertain to the physical geography of the islands.

ROI. The ROI for land use and recreation is the land and submerged lands of Tinian. The analysis focuses on Tinian International Airport, Tinian seaport, and the routes of the proposed pipeline and roadway improvements.

3.10.2 Existing Conditions

The following section describes land ownership and associated land uses, including coastal zone and submerged lands. Land on Tinian is managed primarily though land ownership, which influences the land use.

Land Ownership and Land Use. Public lands within the CNMI are managed by the CNMI DPL and are subcategorized as Grant of Public Domain, Designated/In Use, Undesignated/Not In Use, Leased, and Covenant/Military Leased. Grant of Public Domain Public Lands have been transferred from DPL to another CNMI public agency and are managed by that agency. Designated/In Use Public Lands are actively managed for a particular use such as a forest or a park. Public lands without a specified use are undeveloped and are classified as Undesignated/Not In Use Public Lands. Leased Public Lands are leased to non-government agencies and require government approval. The CNMI Office of Planning and Development

was established in 2017 to oversee land use planning and sustainable development, consistent with DPL.

Public lands make up approximately 90 percent (approximately 22,682 acres) of lands on Tinian, while private lands account for approximately 10 percent (2,434 acres) of Tinian land (CNMI DPL 2018). **Table 3.10-1** presents the breakdown of Tinian land ownership on Tinian, and **Figure 3.10-1** provides a depiction of land ownership on Tinian. CNMI DPL land use designations, which are a combination of land ownership and land uses, are shown in **Figure 3.10-2**. This figure includes the best available data, and the following land use descriptions have been updated with information provided in the CNMI Comprehensive Land Use Plan and the associated GIS Map Book (CNMI DPL 2019).

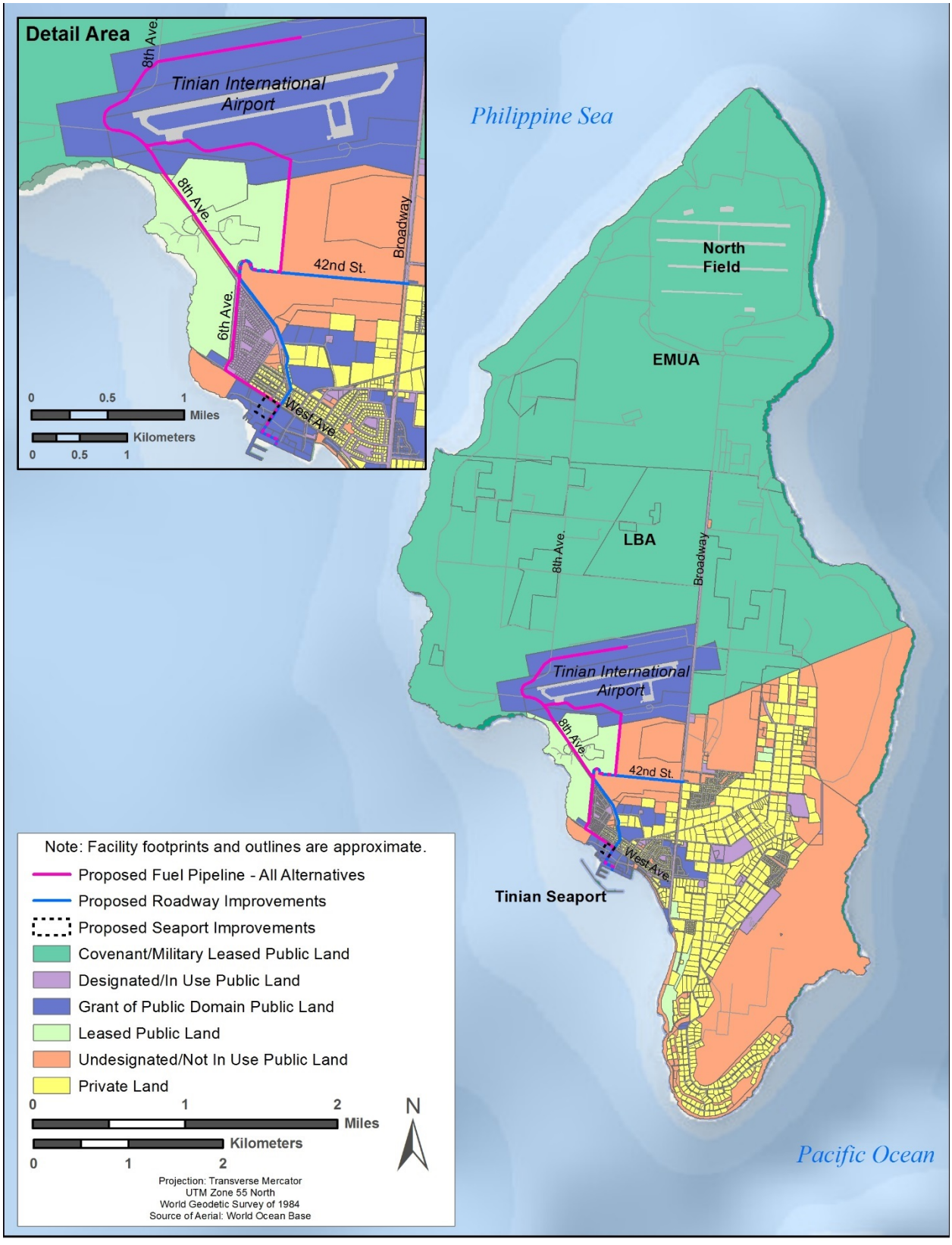
Table 3.10-1. Tinian Land Ownership

Owner	Sub-classification	Acres
Private Lands	Private	2,434
Public Lands	Grant of Public Domain	1,604
	Designated/In Use	1,278
	Leased	1,458
	Covenant/Military Leased	15,469
	Undesignated/Not in Use	2,874
	Total	**25,117**

Source: CNMI DPL 2019

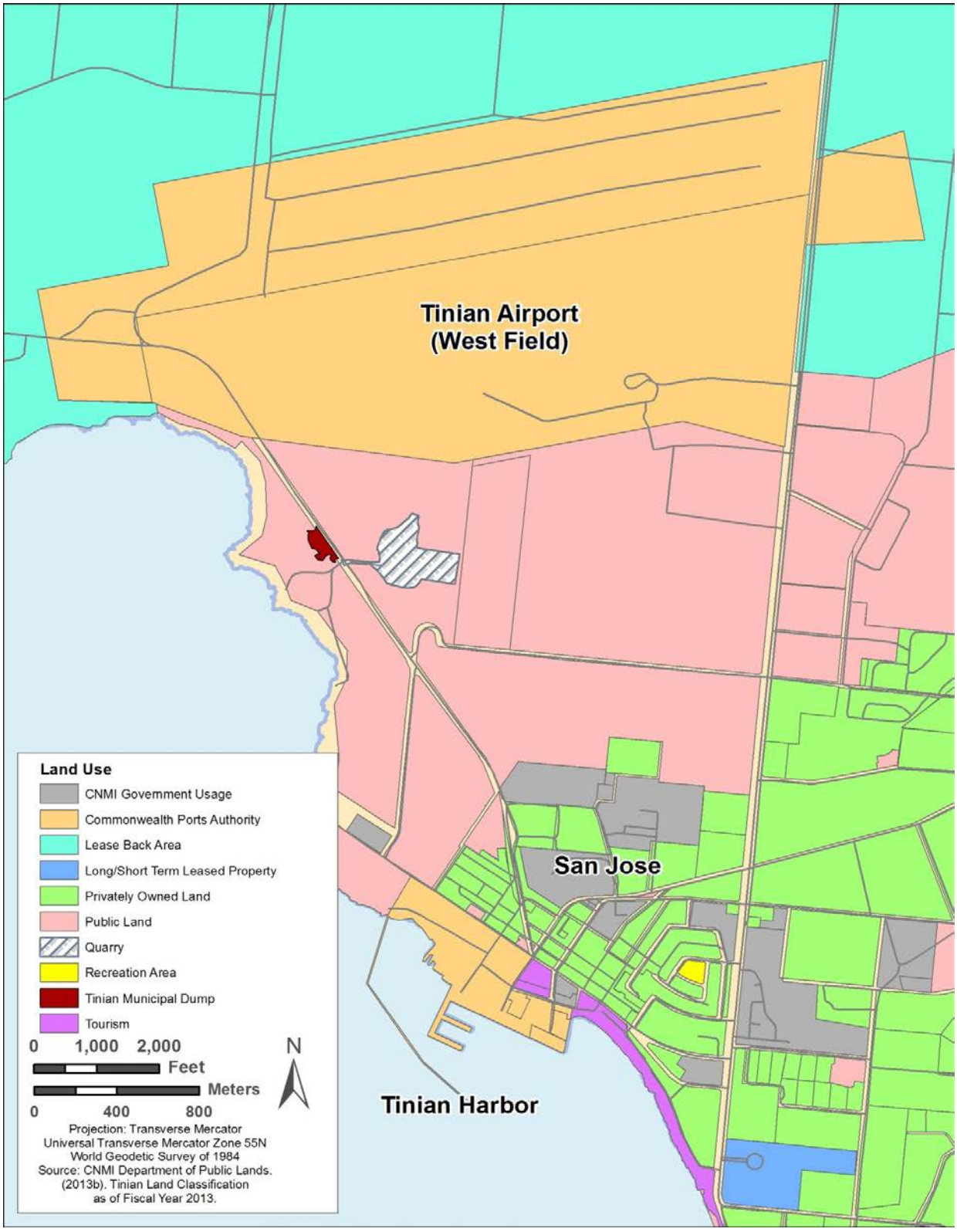
Tinian International Airport and the Tinian seaport are owned and operated by the CPA under the Commonwealth Ports Authority Act. The airport is situated on approximately 1,400 acres of public land that is designated as a public facility (CPA). The area surrounding the airport is public land designated primarily as public facility undeveloped, undeveloped public land, and various conservation and agriculture uses (CNMI DPL 2019). The Tinian seaport, which is also a public facility (CPA), contains two piers, a small boat ramp, and a bulk fuel plant. It has undergone emergent repairs to the sea wall, bollards, and fenders and continues to support some shipping vessels. The land surrounding the seaport includes public and private land that are a mixture of public facility, residential, public facility undeveloped, undeveloped public land, and commercial/service industry uses (CNMI DPL 2019). Other land uses south of the airport and north of the seaport within public land include a quarry and a landfill (Tinian Municipal Dump).

Coastal Zone and Submerged Lands. The coastal zone of the CNMI includes all non-federally owned or leased lands and water areas, including submerged lands and waters within 3 nautical miles of the coast. Submerged lands refer to coastal waters extending from the CNMI coastline into the ocean for 3 nautical miles, which is the limit of state, commonwealth, or territorial jurisdiction.



Source: DoN 2015a

Figure 3.10-1. Land Ownership on Tinian



Source: DON 2010b

Figure 3.10-2. Land Use Near the Proposed Actions

The CZMA is administered in the CNMI by the DCRM within the BECQ. As part of the CNMI Coastal Resources Management (CRM) Program, the DCRM has identified Areas of Particular Concern (APCs), which are separate geographically delineated areas within CRM jurisdiction (i.e., coastal zone) that are subject to special management requirements and specific criteria permit evaluations. Currently, the following five APCs are in the CNMI (CNMI CRMO 2012):

- *Shoreline.* Area between the mean high water mark and 150 feet inland.
- *Lagoon and Reef.* Area extending seaward from the mean high water mark to the outer slope of the reef.
- *Wetlands and Mangrove.* Areas that are permanently or periodically covered with water and where species or mangrove vegetation can be found.
- *Port and Industrial.* Land and water areas surrounding the commercial ports of Saipan, Tinian, and Rota.
- *Coastal Hazards.* Areas identified as a coastal flood hazard zone (zones V and VE) in the FEMA FIRMs.

All five APCs are found on Tinian. The Shoreline, Lagoon and Reef, and Coastal Hazards APCs surround the entire island of Tinian. The Wetlands and Mangrove APC consists of four main areas: Lake Hagoi, Mahalang complex, and Bateha in the MLA, and Makpo in the southeast portion of the island. The Port and Industrial APC consists of Tinian seaport in San Jose (CNMI DCRM 2016).

Before work begins on any project to be located wholly or partially within an APC or if a project is a major siting (i.e., a proposed project that has the potential to directly and significantly impact coastal resources), regardless of whether the project is within an APC, a valid CRM permit must be obtained. A CRM permit is not required for projects on federal-lease lands or federally owned submerged lands, but a federal consistency determination under CZMA would be required. Separately, any federal agency proposing to conduct or support an activity that will directly affect the CNMI coastal zone is required to do so in a manner consistent to the maximum extent practicable with the CNMI CRM Program. As such, a federal agency must conduct a consistency determination under the CZMA. If the DCRM does not issue a written response to the agency's consistency determination within 60 days of application certification, the federal agency may presume concurrence that the activity is consistent with the CNMI CRM Program.

Recreation. The predominant community and tourism activities on Tinian are on the southwestern portion of the island, associated with San Jose Village. Several small and narrow fringing reefs and a small barrier reef are found near Tinian Harbor on the western side of the island. Recreational resources include trails, historic and cultural attractions, beaches and parks, scenic points, and dive spots throughout the island (see **Figure 3.10-3**). Detailed information on recreational resources on Tinian is provided in the 2016 Divert EIS (Final EIS, Section 3.9.2.2).

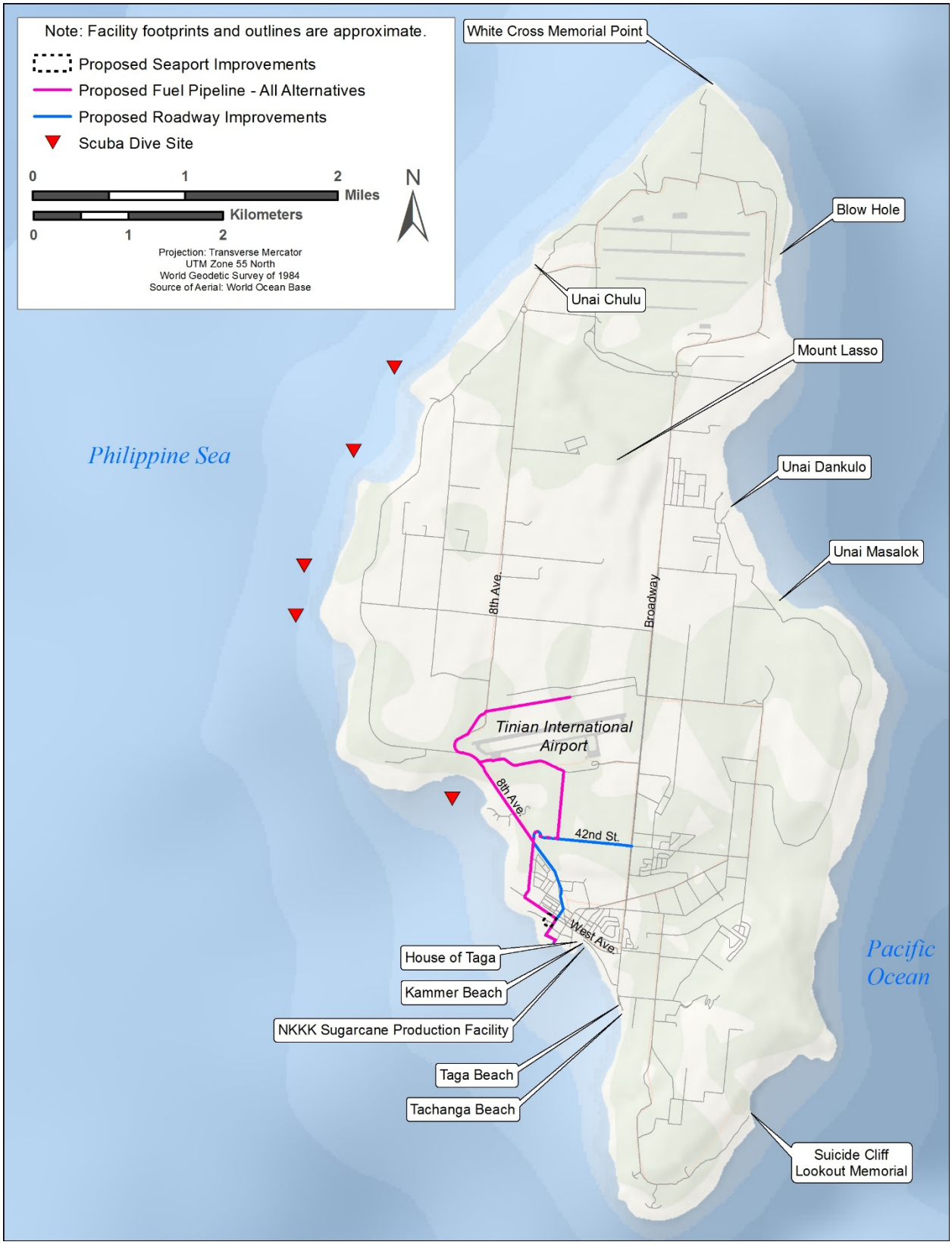


Figure 3.10-3. Popular Recreational Resources on Tinian

3.11 Hazardous Materials and Waste

3.11.1 Definition of the Resource

Hazardous materials are defined by 49 CFR § 171.8 as hazardous substances, hazardous wastes, marine pollutants, elevated temperature materials, materials designated as hazardous in the Hazardous Materials Table (49 CFR § 172.101), and materials that meet the defining criteria for hazard classes and divisions in 49 CFR § 173. Hazardous wastes are defined by the Resource Conservation and Recovery Act (RCRA) at 42 USC § 6903(5), 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."

Petroleum products include crude oil or any derivative thereof, such as gasoline, diesel, or propane. They are considered hazardous materials because they present health hazards to users in the event of incidental releases or extended exposure to their vapors.

Evaluation of hazardous materials and wastes focuses on the storage, transportation, handling, and use of hazardous materials, as well as the generation, storage, transportation, handling, and disposal of hazardous wastes. In addition to being a threat to humans, the improper release or storage of hazardous materials, hazardous wastes, and petroleum products can threaten the health and well-being of wildlife species, habitats, soil systems, and water resources.

3.11.2 Existing Conditions

No hazardous materials, hazardous wastes, or petroleum products are known to exist and no environmental contamination has been documented along the proposed West route and East route of the fuel pipeline, at the location for the seaport support infrastructure, and along the roadways proposed for improvement. However, several facilities proximate to the project areas use and store hazardous materials, hazardous wastes, and petroleum products. Additionally, industrial and military activities have occurred on Tinian since before modern environmental regulations; therefore, there is the potential that improper onsite use, storage, and disposal of hazardous materials, hazardous wastes, and petroleum products has occurred and contaminated soil or groundwater is potentially within the project areas.

Sites in proximity to the project areas that are known to use, store, or dispose of hazardous materials, hazardous wastes, and petroleum products or with the potential to have been impacted by past spills or releases are shown in **Figure 3.11-1** and include the following:

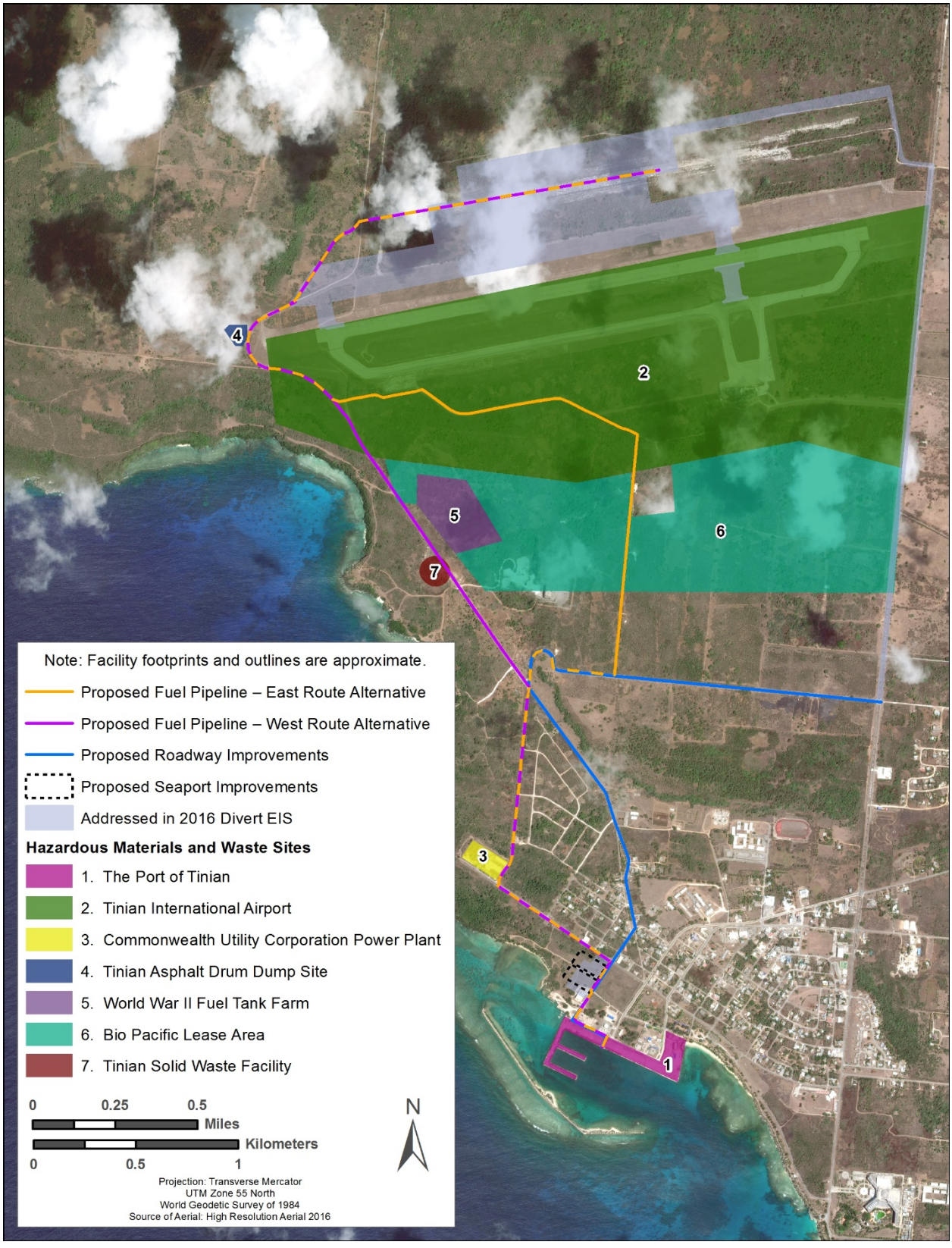


Figure 3.11-1. Hazardous Materials and Waste Sites near the Project Areas

1. *The Port of Tinian.* A bulk fuel storage facility is located at the Port of Tinian; however, the facility is not within the project area. It is adjacent to the proposed West route and East route of the fuel pipeline and roadway improvements. The facility receives and stores petroleum products for use at the island's power plant and vehicle fueling stations. Fuel is delivered to the facility by tanker vessel from Guam on a monthly basis. Fuel is offloaded via a 4-inch pipeline into a 500,000-gallon, diesel AST and 63,000-gallon, gasoline AST. A release of approximately 10,000 gallons of unleaded gasoline was reported at the fuel storage facility in 1992. While the boundaries for the area impacted by the release is not available, it is unlikely this area coincides with the project areas. Remediation of soil and groundwater was implemented, and the site is subject to quarterly groundwater monitoring. No groundwater monitoring wells are believed to coincide with the project areas. Fuel ASTs and piping were inspected by Mobil following Typhoon Yutu in October 2018 and there was no indication of damage to this infrastructure or of a release (Jacobs 2019).

2. *Tinian International Airport.* Tinian International Airport is adjacent to the proposed West route and East route of the fuel pipeline. The airport uses, handles, and stores hazardous materials, hazardous wastes, and petroleum products for day-to-day operations. However, because the airport currently only is served by smaller aircraft and has limited aircraft maintenance and repair capabilities, the amounts of hazardous materials, hazardous wastes, and petroleum products are limited. Fuel storage infrastructure at the airport currently includes two diesel ASTs measuring 1,500 and 2,000 gallons each. Other hazardous materials used at the airport include pesticides, industrial and household cleaning products, hydraulic fluids, paints, and solvents. Jet fuel is not currently available at Tinian International Airport. The only aviation fuel available is 100 Low Lead Aviation Gasoline, which is for piston-engine aircraft. The 100 Low Lead Aviation Gasoline is delivered from Saipan via isotanks. Tinian International Airport exchanges one empty isotank at the seaport when a full tank arrives. Only minor leaks have been reported at the airport. However, there is the potential for improper onsite disposal of hazardous and petroleum wastes to have occurred during former operations because the airport predates modern environmental regulations and was used by Japanese and American military forces during World War II (DON 2015a, USAF 2016a). As described in the 2016 Divert EIS (Final EIS, Section 2.5.2), USAF will construct and operate 9.24 million gallons of jet fuel storage capacity at Tinian International Airport, configured using two, 2.52-million gallon ASTs and one, 4.20-million gallon AST.

3. *Commonwealth Utility Corporation Power Plant and Fuel Delivery Pipeline*. The Commonwealth Utility Corporation power plant is at the intersection of TR26 and 6th Avenue and is adjacent to the proposed West route and East route of the fuel pipeline. The power plant's fuel storage infrastructure includes a 500,000-gallon diesel AST and five smaller diesel and gasoline ASTs. Fuel is transported to the power plant from the Port of Tinian through a 3-inch-diameter pipeline. This pipeline is largely aboveground except where it cross beneath roadways. This pipeline coincides with the proposed West route and East route along TR26. Additionally, the proposed roadway

improvements cross the pipeline at the intersection with TR26. No reported releases have been reported at the power plant or along the pipeline (DON 2015a).

4. *Tinian Asphalt Drum Dump Site.* The Tinian Asphalt Drum Dump Site is a Defense Environmental Restoration Program for Formerly Used Defense Sites site (DON 2015a, USAF 2016a). It is located at the western end of the Tinian International Airport runway and adjacent to the proposed West route and East route of the fuel pipeline. Few details regarding the environmental conditions of this dumpsite are available; however, this site is believed to have resulted from military activities during World War II. The remnants of asphalt plant equipment, drums, and scrap metal are believed to be at the site.
5. *World War II Fuel Tank Farm.* A World War II-era fuel tank farm was located east of TR25 to the south of the Tinian International Airport (DON 2015a). This site is adjacent to the proposed West route of the fuel pipeline along TR25. The site is unevaluated for whether all fuel storage tanks were removed and the environmental conditions of soil and groundwater. Evidence suggests munitions might also be present on the site.
6. *Bio Pacific Lease Area.* The Bio Pacific Lease Area is a large area south of the Tinian International Airport that was used during the 1980s for experimental cultivation of sugar cane (DON 2015a). Several chemicals, including pesticides, may have been applied to the land; however, the environmental conditions have not been evaluated. This area is adjacent to the proposed West route of the fuel pipeline along TR25 and coincides with a portion of the proposed East route.
7. *Tinian Solid Waste Facility.* The Tinian Solid Waste Facility is adjacent to the proposed West route of the fuel pipeline along TR25. The facility has been used for unrestricted dumping of municipal, medical, and military waste in an unlined landfill. The site does not comply with RCRA regulations governing landfills. The environmental conditions at this facility is unevaluated (DON 2015a, USAF 2016a).

Additionally, Typhoon Yutu made landfall on Tinian in October 2018 and resulted in temporary and potentially permanent hazardous waste conditions. Typhoon Yutu damaged and dismounted numerous transformers on Tinian in October 2018. As of February 2019, transformers were being removed and associated polychlorinated biphenyl-contaminated material was being excavated across the island (Jacobs 2019). Household hazardous waste, electronic waste, nonhazardous 55-gallon drum waste, nonhazardous material, and generators used for or generated by damage from Typhoon Yutu were accumulated at a storage area at the seaport and these materials were transferred to a disposal facility off-island (PACAF 2019).

Tinian was a battleground during World War II; therefore, there is the potential for UXO to be present within the project areas. UXO is most likely to be discovered in heavily vegetated areas that have not been developed since World War II. Because the area north of the Tinian International Airport was extensively cleared during construction of West Field, it is likely that most of the UXO has been removed from the northern portion of the proposed West route and East route of the fuel pipeline (CPA and FAA 1998). However, in the remaining portions of the project areas, the presence of UXO has not been confirmed but the possibility exists for its discovery.

3.12 Air Quality

3.12.1 Definition of the Resource

Air quality is defined as a measurement of pollutants in the air. Air quality refers to pollutants in the air, and the health and safety aspect of those pollutants to humans and the environment, including plants and animals. Air pollution refers to chemical substances, particulates, biological materials, or other harmful materials that degrade the quality of the atmosphere. Air quality is affected by air pollutants from mobile sources such as vehicles, aircraft, ships, and construction equipment, as well as by stationary sources such as emergency generators, industrial stacks, exhaust vents, prescribed fires, and natural processes (e.g., wildfires and volcanic activity).

The air quality ROI for the Proposed Actions is Tinian's airshed, which includes the land areas and coastal waters within 3 nautical miles of the island.

In accordance with Federal Clean Air Act (CAA) requirements, the air quality in a given region or area is measured by the concentration of various pollutants in the atmosphere. The measurements of these "criteria pollutants" in ambient air are expressed in units of parts per million (ppm), parts per billion (ppb), milligrams per cubic meter (mg/m^3), or micrograms per cubic meter ($\mu g/m^3$). The air quality in a region is a result not only of the types and quantities of atmospheric pollutants and pollutant sources in an area, but is also influenced by the surface topography, the size of the topological "air basin," and the prevailing meteorological conditions.

The regulatory framework governing air quality for the Proposed Actions includes the CAA (42 USC § 7401 et seq.) and CNMI Air Pollution Control Regulations (52 FR 43574 and 79 FR 22032).

Ambient Air Quality Standards. The CAA directed USEPA to develop, implement, and enforce strong environmental regulations that would ensure clean and healthy ambient air quality. To protect public health and welfare, USEPA developed numerical concentration based standards, or National Ambient Air Quality Standards (NAAQS), for pollutants that have been determined to impact human health and the environment. USEPA established primary and secondary NAAQS under the provisions of the CAA.

USEPA, under the requirements of the CAA, and codified in 40 CFR § 50, established NAAQS for the following six contaminants, referred to as criteria pollutants:

- Carbon monoxide (CO)
- Nitrogen dioxide (NO_2)
- Ozone (O_3)
- Respirable particulate matter (including particulate matter equal to or less than 10 microns in diameter [PM_{10}] and particulate matter equal to or less than 2.5 microns in diameter [$PM_{2.5}$]),
- Lead (Pb)
- Sulfur dioxide (SO_2).

Although O_3 is considered a criteria pollutant and is measureable in the atmosphere, it is not often considered a regulated pollutant when calculating emissions because O_3 is typically not emitted directly from most emissions sources. Ozone is formed in the atmosphere by photochemical reactions involving sunlight and previously emitted pollutants or O_3 precursors. The O_3 precursors consist primarily of nitrogen oxides (NO_x) and volatile organic compounds (VOCs) that are directly emitted from a wide range of emissions sources. For this reason, regulatory agencies attempt to limit atmospheric O_3 concentrations by controlling NO_x and VOC pollutants.

The primary NAAQS represent maximum levels of background air pollution that are considered safe, with an adequate margin of safety to protect public health. They were established to protect human health, particularly the health of sensitive populations such as asthmatics, children, and the elderly. Sensitive land uses protected by the primary NAAQS are areas used by these sensitive populations including residences, hospitals, libraries, churches, parks, playgrounds, and schools.

Secondary NAAQS represent the maximum pollutant concentration necessary to protect vegetation, crops, and other public resources along with maintaining visibility standards. They set limits to protect the environment, including plants and animals, from adverse effects associated with pollutants in the air.

The CAA also gives the authority to states, territories, and commonwealths to establish air quality rules and regulations, including adopting the NAAQS. The CNMI has adopted the Federal NAAQS. **Table 3.12-1** presents the primary and secondary Federal NAAQS.

Attainment and General Conformity. USEPA classifies the air quality in an air quality control region (AQCR), or in subareas of an AQCR, according to whether the concentrations of criteria pollutants in ambient air exceed the NAAQS. Areas within each AQCR are therefore designated as “attainment,” “nonattainment,” “maintenance,” or “unclassified” for each of the six criteria pollutants.

Attainment means that the air quality within an AQCR is better than the NAAQS. In these areas, concentration levels of a criteria pollutant are beneath the NAAQS. Nonattainment means that a criteria pollutant level equals or exceeds the NAAQS. Maintenance indicates that an area was previously designated nonattainment, but is now attainment, and has an approved maintenance plan under § 175 of the CAA. Unclassifiable means insufficient data exist to determine an area’s attainment status, so the area is considered in attainment.

USEPA has delegated the authority for ensuring compliance with the NAAQS in the CNMI to the CNMI BECQ. The CNMI BECQ’s air pollution control regulations can be found at 52 FR 43574 and 79 FR 22032. In accordance with the CAA, each state or commonwealth must develop a State Implementation Plan (SIP), which is a compilation of regulations, strategies, schedules, and enforcement actions designed to bring the state or commonwealth into compliance with all NAAQS.

Table 3.12-1. National and CNMI Ambient Air Quality Standards

Pollutant	Averaging Time	Primary Standard		Secondary Standard
		Federal	CNMI	
CO	8-hour (5)	9 ppm (10 mg/m^3)	Same	None
	1-hour (5)	35 ppm (40 mg/m^3)	Same	None
Pb	Rolling 3-Month Average (6)	0.15 µg/m^3 (1)	Same	Same as Primary
NO_2	Annual (7)	53 ppb (2)	Same	Same as Primary
	1-hour (8)	100 ppb	Same	None
PM_{10}	24-hour (9)	150 µg/m^3	Same	Same as Primary
$PM_{2.5}$	Annual (10)	12 µg/m^3	Same	15 µg/m^3
	24-hour (8)	35 µg/m^3	Same	Same as Primary
O_3	8-hour (11)	0.07 ppm (3)	Same	Same as Primary
SO_2	1-hour (12)	75 ppb (4)	Same	None
	3-hour (5)	--	Same	0.5 ppm

Sources: USEPA 2015, CNMI BECQ 2004, CNMI 2012

Notes: Parenthetical values are approximate equivalent concentrations.

1. In areas designated nonattainment for the Pb standards prior to the promulgation of the current (2008) standards, and for which implementation plans to attain or maintain the current (2008) standards have not been submitted and approved, the previous standards (1.5 µg/m^3 as a calendar quarter average) also remain in effect.
2. The level of the annual NO_2 standard is 0.053 ppm. It is shown here in terms of ppb for the purposes of clearer comparison to the 1-hour standard level.
3. 2015 O_3 standard. The previous (2008) O_3 standards remain in effect in some areas.
4. The previous SO_2 standards (0.14 ppm 24-hour and 0.03 ppm annual) will additionally remain in effect in certain areas: (1) any area for which it is not yet 1 year since the effective date of designation under the current (2010) standards, and (2) any area for which implementation plans providing for attainment of the current (2010) standard have not been submitted and approved and which is designated nonattainment under the previous SO_2 standards or is not meeting the requirements of a SIP call under the previous SO_2 standards (40 CFR § 50.4[3]). A SIP call is a USEPA action requiring a state to resubmit all or part of its SIP to demonstrate attainment of the required NAAQS.
5. Not to be exceeded more than once per year.
6. Not to be exceeded.
7. Annual mean.
8. 98th percentile, averaged over 3 years.
9. Not to be exceeded more than once per year on average over 3 years.
10. Annual mean, averaged over 3 years.
11. Annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years.
12. 99th percentile of 1-hour daily maximum concentrations, averaged over 3 years.

Key: ppm = parts per million; ppb = parts per billion; mg/m^3 = milligrams per cubic meter; µg/m^3 = micrograms per cubic meter

To some degree, the localized air quality condition on Tinian can be correlated with the proximity of major emission sources. Stationary source permits regulate emissions from a facility but cannot be utilized to calculate ambient air quality conditions in terms of the NAAQS.

The General Conformity Rule applies only to actions in nonattainment or maintenance areas. The General Conformity Rule requires that any federal action meet the requirements of an existing SIP or Federal Implementation Plan. More specifically, CAA conformity is ensured when a federal action does not cause a new violation of the NAAQS; contribute to an increase

in the frequency or severity of violations of the NAAQS; or delay the timely attainment of any NAAQS, interim progress milestones, or other milestones towards achieving compliance with the NAAQS. Because Tinian is designated as attainment/unclassifiable, the General Conformity Rule does not apply.

Federal Prevention of Significant Deterioration. Federal Prevention of Significant Deterioration (PSD) regulations apply in attainment areas to major stationary sources (e.g., sources with the potential to emit 250 tons per year [tpy] of regulated pollutants) and significant modifications to major stationary sources (e.g., change that adds 0.6 tpy for Pb, or 10 to 100 tpy depending on the regulated pollutant, to the facility's potential to emit). Additional PSD permitting thresholds apply to significant increases in major stationary source greenhouse gas (GHG) emissions. PSD permitting can also apply to a proposed project if all three of the following conditions exist: (1) the proposed project is a modification with a net emissions increase to an existing PSD major source, and (2) the proposed project is within 10 kilometers of national parks or wilderness areas (i.e., Class I Areas), and (3) regulated stationary source pollutant emissions would cause an increase in the 24 hour average concentration of any regulated pollutant in the Class I area of 1 $\mu g/m^3$ or more (40 CFR § 52.21[b][23][iii]). A Class I area includes national parks larger than 6,000 acres, national wilderness areas and national memorial parks larger than 5,000 acres, and international parks. PSD regulations also define ambient air increments, limiting the allowable increases to any area's baseline air contaminant concentrations, based on the area's Class designation (40 CFR § 52.21[c]). USEPA administers the PSD program in the CNMI. Emissions associated with the Proposed Action are not expected to trigger PSD.

Title V Requirements. Title V of the CAA Amendments of 1990 requires states and local agencies to permit major stationary sources. A Title V major stationary source has the potential to emit regulated air pollutants and hazardous air pollutants (HAPs) at levels equal to or greater than Major Source Thresholds. Major Source Thresholds vary depending on the attainment status of an AQCR. The purpose of the permitting rule is to establish regulatory control over large, industrial-type activities and monitor their impact on air quality. Section 112 of the CAA lists HAPs and identifies stationary source categories that are subject to emissions control and/or work practice requirements. Emissions associated with the Proposed Action are not expected to trigger Title V.

Greenhouse Gas Emissions. GHGs are gas emissions that include water vapor, carbon dioxide (CO_2), methane, nitrous oxide, O_3, and several fluorinated and chlorinated gaseous compounds.

Fugitive Dust Emissions. CNMI Air Pollution Control Regulations in Chapter 65-10, Part 415 relating to fugitive dust, require reasonable precautions to prevent particulate matter from becoming airborne. This is applicable to materials handling, transport, and storage. This is also applicable to road construction, repair, alteration, and demolition. Visible fugitive dust emissions are not allowed beyond the lot line of the property on which the emissions originate.

3.12.2 Existing Conditions

Tinian is in the CNMI, which is within the USEPA Pacific Southwest Region 9 (USEPA 2011). As defined in 40 CFR § 81.354, due to lack of monitoring the CNMI is designated as attainment/unclassifiable for all criteria pollutants (USEPA 2012). USEPA has not designated an AQCR that encompasses the CNMI. In addition, no emissions inventories or monitoring data are available locally or regionally for the CNMI.

The U.S. Department of Energy, Energy Information Administration, does not provide estimates for gross CO_2 emissions for the CNMI.

The CNMI BECQ regulates air quality air permits for stationary air pollution sources in the CNMI. The CNMI BECQ requires all air permit application submissions to include dispersion modeling (conservative or refined), which is evaluated and compared against the NAAQS for compliance.

Tinian has a tropical climate. Over the course of the year, the temperature varies from 76 to 88 degrees Fahrenheit (24 to 31 degrees Celsius) and is rarely below 73 degrees Fahrenheit (22 degrees Celsius) or above 90 degrees Fahrenheit (32 degrees Celsius). The probability of precipitation varies throughout the year but occurs most often around October. Wind speeds typically vary from 2 to 22 miles per hour with dominant winds originating from the east. Due to its location relative to an area of cyclonic development in the Pacific Ocean, Tinian is always under weather condition 4, which means that 40 miles per hour winds are possible within 72 hours (Pacific RISA undated). It is anticipated that air pollutants from the island are quickly dispersed under normal weather conditions.

There are no Class I areas in the CNMI, and the CNMI is not within 10 kilometers of a Class I area. The existing airport and seaport are not PSD major sources. Emissions associated with the Proposed Actions are not expected to create a major source or trigger PSD.

The largest stationary sources on Tinian include power generation units and facilities that comprise the existing island-wide power system owned by the Commonwealth Utilities Corporation. The power generation facility consists of four 2.5 MW diesel generators and two 5 MW diesel generators. These generators are the largest stationary sources of air emissions on Tinian. In addition to the major stationary sources, facilities may have back-up generators in case of grid power failure; however, these sources are intermittent and considered minor stationary sources.

Traffic along major travel routes, such as TR21 and TR25 within the San Jose area, is the dominant source of mobile emissions. Operation of aircraft and vessels also generates emissions. Existing effects from these emission sources are negligible when compared to those from adjacent roadway traffic.

4. Environmental Consequences

This section presents the analysis of potential impacts on the identified resources from the Proposed Actions and No Action Alternatives. The potential impacts are provided for each Proposed Action and No Action Alternative, and a summary of potential impacts is provided at the end of each resource analysis if both Proposed Actions were to be implemented.

As described in **Section 3,** throughout this SEIS, as applicable, the area for each of the Proposed Actions or alternatives that could be physically disturbed is referred to as the "project area." The term "project area" encompasses the locations proposed for construction for each particular Proposed Action. This SEIS uses the term ROI to describe the complete geographic scope of potential consequences for the resource area. For most of the resource areas, the ROI is defined as the area of the island affected by the construction or operation of the proposed infrastructure. For some resources, such as noise, air quality, and socioeconomics, the ROI extends into surrounding communities, or across the CNMI, unique to that specific resource. Specific descriptions of compliance actions have been integrated into the resource area analysis for each alternative and are summarized in **Appendix F**.

4.1 Noise

4.1.1 Analysis Methodology

Noise impact analysis evaluates potential changes to the existing noise environment that would result from a proposed action. Potential changes in the acoustical environment can be beneficial (i.e., if they reduce the number of sensitive receptors exposed to high noise levels or reduce the ambient sound level) or adverse (i.e., if they result in increased sound exposure to high noise levels or ultimately increase the ambient sound level). Significant noise impacts would be those that exceed allowable thresholds as defined under local or state regulations, or result in sustained noise annoyance or noise exposure affecting nearby NSRs.

Noise annoyance is defined by USEPA as any negative subjective reaction to noise by an individual or group. DNL is an accepted metric for quantifying community annoyance to general environment noise, including construction noise. **Table 4.1-1** lists the percentages of people that would be projected to be "highly annoyed" when exposed to various levels of noise measured in DNL. This table presents consolidated results of more than a dozen studies of the relationship between noise and annoyance levels. This relationship was suggested in 1977 by the National Academy of Sciences and was recently reevaluated for use in describing peoples' reactions to semicontinuous (transportation) noise (Finegold et al. 1994). **Table 4.1-1** provides a perspective on the level of annoyance that might be anticipated from construction of the Proposed Actions.

Table 4.1-1. Percentage of Population Highly Annoyed by DNL Noise Levels

DNL Noise Contours	Percentage of Persons Highly Annoyed	
	Low	High
65–70 dBA	12	22
70–75 dBA	22	36
75–80 dBA	36	54
80+ dBA	> 54	

Source: Finegold et al. 1994

4.1.2 Pipeline and Support Infrastructure

4.1.2.1 West Route

Construction. Short-term, minor to moderate impacts on the ambient sound environment would be expected from construction of the West route pipeline from construction equipment and trucks. It is not anticipated that the temporary increase in ambient sound levels associated with construction would result in a significant noise impact. Construction could be restricted to between sunrise and sunset to reduce annoyance to adjacent populations.

Individual equipment used for construction would be expected to result in noise levels comparable to those shown in **Table 4.1-2**. Noise levels associated with the individual types of construction equipment presented in **Table 4.1-2** assumes the equipment would be operated without the use of enclosures, or other sound-reducing equipment. However, use of these common measures would minimize noise impacts.

Table 4.1-2. Noise Levels Associated with Construction Equipment

Equipment Type	Predicted Noise Level at 50 feet (dBA)
Backhoe	72–93
Concrete mixer	74–88
Crane	75–87
Front loader	72–83
Grader	80–93
Jackhammer	81–98
Paver	86–88
Roller	73–75
Truck	83–94

Source: USEPA 1971

Construction vehicle trips would be dispersed throughout the day and noise levels from construction trucks generally range between 83 and 94 dBA, 50 feet from the source. Roadways that would likely receive the majority of the construction and worker traffic include 6th Avenue, TR26, TR25, and TR24. Noise level increases would be temporary, occurring several times per day during work hours. Therefore, noise impacts from construction traffic on the ambient sound environment are not anticipated to be significant.

To predict how construction and related traffic volume increases would impact adjacent populations or other nearby NSRs, noise levels from the probable associated equipment were estimated. **Table 4.1-3** provides the maximum anticipated noise levels that would be generated by project construction and experienced by the NSRs. Construction noise levels at NSRs were generated by estimating the nearest distances at which NSRs would be exposed to construction noise, and the anticipated noise at those distances. Construction of the West route could result in short-term, minor noise impacts on nearby NSRs and would not be significant because construction would not be constant for any one location, and would dissipate as construction progressed along the pipeline corridor. Construction would generally be far enough from NSRs that noise exposure would not reach 65 dB. Additionally, receptors within schools or residences would experience reduced noise levels as walls or windows would muffle the sound. However, some residences along TR26 would be exposed to moderate increases in noise levels conservatively estimated to reach 92.7 dB outside, without barriers, when construction actions are occurring immediately adjacent to those locations.

Construction at the seaport, including operation of construction equipment and vehicles, would conservatively generate a noise level of approximately 90.7 dB within 50 feet of the construction site. As shown in **Table 4.1-3**, noise levels at nearby NSRs would not reach or exceed 65 dBA.

Operation. Once constructed and in service, normal pipeline operations are not audible. Operation of the booster pump station would generate noise, but the pumps would be enclosed within the pump station building which would reduce noise levels. Noise from the booster pump station would be consistent with the existing noise levels for the surrounding area, and would not be disruptive or reach levels of annoyance.

4.1.2.2 East Route

Because the routing of the West and East routes are the same from the seaport northward to TR24, noise impacts on nearby communities resulting from construction of the East route in this portion of the East route would be the same as described for the West route. Each residence in San Jose located along TR26 would be moderately impacted by construction noise within a 0.5-mile proximity. However, as construction progresses toward the 6th Avenue connection, the level of noise exposure on those residences would return to ambient conditions. As pipeline installation progresses north of TR24 and along the final approaches to the Divert fuel storage tank, construction noise impacts would be concentrated around the southern, western, and northern boundaries of the airfield. Impacts on noise from construction of the seaport support infrastructure would be the same as those described for the West route.

Operation. Once constructed and in service, normal pipeline operations are not audible. Operation of the booster pump station would generate noise, but the pumps would be enclosed within the pump station building which would reduce noise levels. Noise from the booster pump station would be consistent with the existing noise levels for the surrounding area, and would not be disruptive or reach levels of annoyance.

Table 4.1-3. Noise Level Exposure for NSRs in Proximity to Pipeline and Support Infrastructure Construction

NSR	Type	Nearest Construction and Noise Level [1, 2, 3]			
		Pipeline Installation			Seaport Infrastructure
		6th Avenue	TR26	TR24	Seaport
		dB	dB	dB	dB
Tinian High School	School	53	56	57	53
Tinian Elementary School	School	53	62	54	56
Northern Marianas College, Tinian	School	59	57	58	54
City of San Jose	Residential Area	64	93	59	63
Kammer Beach	Recreational and Residential Area	53	65	47	61
Marpo Heights	Residential Area	49	60	60	49
Northeast Marpo Heights	Residential Area	45	46	53	45
San Jose Catholic Church	Place of Worship	54	64	52	63
Tinian Health Center	Medical Facility	53	62	52	56

Table Notes:

[1] Noise levels calculated using OSHA Technical Manual formula for determining cumulative construction noise levels at a distance (OSHA 2013).

[2] Noise level is associated with anticipated construction noise for the nearest construction point proximal to the identified NSR. In the cases of residential areas, residences are at least 25 feet from the nearest roadway. Generally, residences located along roadways were determined to have setback distances of between 25 and 150 feet

[3] Distances indicated for residential areas use an individual residence located nearest to the road where construction actions could occur. Because the alternative routes use different roadway combinations, the residences located nearest to each road were used for distance determinations.

4.1.2.3 No Action Alternative

Under the No Action Alternative, USAF would not construct and operate the fuel pipeline and support infrastructure, but would construct a fuel storage tank at the seaport and use fuel trucks to transport fuel from the seaport to the airport. As described in the 2016 Divert EIS (Final EIS, Section 4.1.2.1), noise levels from construction of the fuel storage tank would be similar to those presented for construction of the seaport support infrastructure. Additionally, noise impacts associated with fuel truck trips between the airport and seaport would be short-term and moderate on receptors adjacent to the roadways. These impacts would be similar to the noise expected from construction vehicles for construction of the pipeline.

4.1.3 Roadway Improvements

4.1.3.1 Proposed Action

Noise impacts on San Jose residential areas would be short-term and moderate for individual residences located nearest the proposed roadway improvement segments of TR25 and TR26, as shown in **Table 4.1-4**. However, as construction progresses northward, noise exposure for residences located approximately 0.5 mile north or south of where construction would actually be occurring would be less than the 65 dBA threshold; therefore, impacts at this distance would be minor. For the duration of construction, measures such as use of barriers, and restricting construction to daytime hours would help to reduce noise increases on nearby populations. The median noise level for roadway improvement construction was estimated at 92.7 dB.

For a distance of approximately 0.5 mile along TR25 during road construction, Tinian Elementary and Northern Marianas College would be exposed to noise exceeding the 65 dBA compatibility threshold. Respectively, outdoor noise level at Tinian Elementary and Northern Marianas College would likely be dominated by the 67 dBA and 77 dBA construction noise levels. Additionally, outdoor noise at the San Jose Catholic Church would be expected to be dominated by the approximately 67 dB construction noise when activities are occurring in its location. Because noise would be intermittent and short term, people at these locations would likely remain indoors during hours of construction, and the buildings would offer some additional level of noise reduction, the annoyance impacts on the people inside the schools and the church would be less. Once construction reaches TR24, noise associated with the roadway improvements would be imperceptible to NSRs. Therefore, significant noise impacts on nearby populations or NSRs would not be expected.

Table 4.1-4. Noise Level Exposure for NSRs in Proximity to Roadway Improvements

NSR	Type	Nearest Construction and Noise Level [1, 2, 3,]
		Road Improvements
		dB
Tinian High School	School	62
Tinian Elementary School	School	67
Northern Marianas College, Tinian	School	77
City of San Jose	Residential Area	99
Kammer Beach	Recreational and Residential Area	63
Marpo Heights	Residential Area	54
Northeast Marpo Heights	Residential Area	50
San Jose Catholic Church	Place of Worship	67
Tinian Health Center	Medical Facility	63

Table Notes:

[1] Noise levels calculated using OSHA Technical Manual formula for determining cumulative construction noise levels at a distance (OSHA 2013).

[2] Noise level is associated with anticipated construction noise for the nearest construction point proximal to the identified NSR. In the cases of residential areas, residences are at least 25 feet from the nearest roadway. Generally, residences located along roadways were determined to have setback distances of between 25 and 150 feet

[3] Distances indicated for residential areas use an individual residence located nearest to the road where construction actions could occur. Because the alternative routes use different roadway combinations, the residences located nearest to each road were used for distance determinations.

4.1.3.2 No Action Alternative

Under the No Action Alternative, only minor roadway repairs along the construction and fuel truck routes would occur, as was considered in the 2016 Divert EIS (Final EIS, Section 4.11.2). Noise level increases associated with road repairs would be short term, direct, and minor as equipment would be minimally required to accommodate repairs.

4.1.4 Summary of Impacts

4.1.4.1 Proposed Actions and Alternatives

Anticipated construction noise impacts on the ambient sound environment would include short-term, intermittent, moderate increases of the outdoor noise levels at residences immediately proximal to roads where operation of equipment and vehicles to construct the proposed fuel pipeline, seaport infrastructure, and roadway improvements would occur. These impacts would be experienced within 0.5 mile of each affected residence along the construction route. Implementing noise reduction measures that would include use of mufflers on construction equipment and limiting construction actions to daytime business hours would be expected to reduce noise impacts on nearby NSRs. Operation of the pipeline and support infrastructure would have no impacts on the noise environment.

4.1.4.2 No Action Alternatives

Under the No Action Alternatives, USAF would not construct and operate the fuel pipeline and support infrastructure, and would not construct roadway improvements; however, USAF would construct a fuel storage tank at the seaport, complete only minor road repairs, and use fuel trucks to transport fuel from the seaport to the airport. Residences near the seaport and near the roadways undergoing minor repair or being used for fuel transport would experience periodic or short-term, minor to moderate increases in noise.

4.2 Biological Resources

4.2.1 Terrestrial Biological Resources

4.2.1.1 Analysis Methodology

Issues and concerns addressed in this section include the potential direct, indirect, and cumulative impacts of construction and implementation of the Proposed Actions and alternatives on terrestrial biological resources. Impacts can be either temporary (reversible) or permanent (irreversible). Direct and indirect impacts are distinguished as follows.

Direct impacts are associated with proposed construction (e.g., ground-disturbing activities) and implementation (e.g., fuel transportation). Potential types of direct impacts include the following:

- Injury or mortality to plants and animals, including special status species, caused by the action
- Loss of habitat due to vegetation removal and excavation during construction
- Temporary avoidance of habitat during construction from noise, lighting, and human activity
- Impacts to terrestrial habitats from potential releases of fuel during operations of the pipeline.

Indirect impacts are caused by or result from project activities, are usually later in time, and are reasonably foreseeable (e.g., increased likelihood of nonnative, invasive species moving into the area after disturbance). Potential indirect impacts include the following:

- Introduction of nonnative, invasive species or increased abundance or dispersal of those species
- A change in freshwater or marine water quality from an increase in erosion or stormwater runoff following installation of the pipeline and improvement of roads.

The level of impact on biological resources is based on (1) the importance (i.e., legal, commercial, recreational, ecological, or scientific) of the resource, (2) the proportion of native biological resource that would be affected relative to its occurrence in the region, (3) the sensitivity of the resource to the proposed activities, and (4) the duration of ecological ramifications. Impacts on biological resources are considered significant if species or habitats of high concern are affected over relatively large areas, or disturbances cause reductions in

population size or distribution of a species of special concern. A habitat perspective is used to provide a framework for analysis of impacts.

ESA Consultation. As a requirement under the ESA, federal agencies must ensure that their actions do not jeopardize the existence of any threatened or endangered species or adversely modify critical habitat. In addition, the ESA prohibits the "taking" of threatened or endangered animals. Section 7 of the ESA establishes a consultation process with USFWS for terrestrial species for evaluating effects of federal projects on protected species.

To comply with Section 7 of the ESA, USAF prepared a Biological Assessment to evaluate the effects of the Proposed Actions on federally listed proposed, threatened, and endangered species and proposed and designated critical habitat. In the Biological Assessment, USAF determined that the Proposed Actions would have no effect on federally listed proposed, threatened, and endangered species and proposed and designated critical habitat. Therefore, consultation with and concurrence from USFWS are not required.

4.2.1.2 Pipeline and Support Infrastructure

4.2.1.2.1 West Route

Vegetation. Long-term, minor, direct impacts on vegetation are expected from construction of the pipeline along the West route. Impacts on vegetation from construction of infrastructure at the seaport would be negligible because that area has been developed and has urban vegetation characterized by introduced landscaped grasses and forbs maintained by periodic mowing. Impacts are not expected on vegetation from the operation of the fuel pipeline or support infrastructure.

If the pipeline were to be constructed along the West route, the ROI would include an estimated 103.63 acres. The utility easement for the pipeline has not yet been selected; therefore, the affected acreage is calculated based on the 2018 survey width, which in areas was 100 feet wide. The actual acreage of vegetation that would be affected during construction would likely be significantly less than 103.63 acres, especially because less than an 80-foot width is expected to be cleared for pipeline installation (see **Table 3.2-1**).

Much of the vegetation to be cleared along the West route is Mixed Introduced Forest (31 acres), Tangantangan Forest (22 acres), and Other Shrub and Grass (19 acres). Over 24 acres of the West route is with Urban and Built Up land. No vegetation communities that are rare and have a high diversity of native plant species, such as native limestone and strand forests, would be disturbed. Thus, construction of the pipeline would cause a minor reduction in native vegetation and little or no change in the diversity of vegetation communities or composition of vegetation within those communities. Because much of the route has been previously disturbed, vegetation communities there are dominated by nonnative species, and native plants are uncommon, installation and operation of the pipeline would not cause a noticeable increase in invasive or other nonnative vegetation in the area.

Wildlife. Short-term, minor, direct impacts on native wildlife are expected from construction of the pipeline along the West route. Impacts on wildlife from construction of infrastructure at the seaport would be negligible because the site and surrounding area has been developed and

has little or no suitable habitat for native species. Impacts are not expected on wildlife from the operation of the fuel pipeline or support infrastructure.

Forested areas along the western and southern portion of the West route are used by the Tinian native forest birds such as the Mariana fruit dove, Micronesian starling, collared kingfisher, rufous fantail, Tinian monarch, and by numerous other native and nonnative species of wildlife. Pipeline construction would cause a loss of a small amount of the available habitat for those species on Tinian. There are over 11,000 acres of tangantangan and other second growth forest vegetation on Tinian (Donnegan et al. 2011); therefore, installation of a fuel pipeline along the West route would result in the loss of a negligible amount of available suitable habitat on Tinian.

Migratory birds and other mobile wildlife would temporarily avoid areas along and near the pipeline route during construction. Smaller, less-mobile species and nesting birds could inadvertently be harmed during construction. To avoid harming nesting birds, surveys or monitoring during construction would be conducted and areas where active nests are found would be avoided, or other measures would be taken to avoid harming any migratory birds, nests, or eggs. Long-term, permanent impacts on native species of wildlife would be minor because very little habitat used by those species would be disturbed and because the species observed in the project area are abundant in surrounding areas.

Nonnative, invasive species are an important threat to native wildlife on Tinian (CNMI DFW 2015). Movement of equipment and supplies could result in the introduction or spread of invasive plant and animal species to Tinian. The potential establishment of the brown tree snake (*Boiga irregularis*) is of great concern there. If brown tree snakes were to become established (without immediate suppression) on Tinian under the Proposed Action, the impacts would likely be similar to those experienced on Guam (DON 2010b). EO 13112 directs agencies to prevent the spread of invasive species in their work. To prevent the introduction of brown tree snakes and the spread of other invasive species, control and interdiction methods agreed upon by USFWS and USAF for construction of facilities at the Tinian International Airport (USFWS 2013, USFWS 2015c) would be implemented during construction of the pipeline and for other proposed infrastructure upgrades. These measures, which include minimizing the routing of shipments through Guam, and redundant inspection of materials that must be shipped from that island, would reduce to a very low level the risk that a brown tree snake would be transported to Tinian during pipeline construction. USAF would also conduct risk analyses, develop and implement procedures, and participate in regional planning to reduce or eliminate the spread of other invasive species.

Special Status Species. Two fadang were observed during the 2018 survey along the southern edge of road TR26. The two individuals were planted as part of a decorative landscape for the Nanyo Kohatsu Kabushiki Kaisha Administration Building and Laboratory, which is listed on the NRHP. The proposed pipeline would be designed and sited to avoid the two individual fadang and the associated NRHP-listed property. The pipeline would be located within a proposed utility easement between the existing overhead electrical lines and road. During construction, crews and equipment would entirely avoid the NRHP-listed property and

the two fadang within the landscaped area. Thus, construction and operation of the proposed fuel pipeline and support infrastructure, and roadway improvements would not affect fadang.

No other terrestrial species listed as threatened and endangered under the federal ESA or by CNMI (see **Table 3.2-2**) could be affected by pipeline construction along the West route or the seaport support infrastructure. The pipeline would be constructed in Mixed Introduced Forest, Tangantangan Forests, mowed fields, Casuarina Thickets, or other disturbed or developed areas (see **Table 3.2-1**). Threatened and endangered species occur on Tinian in native limestone forests, beachstrand forests, or wetlands, none of which exists within or near the West route (see **Table 3.2-2**). For example, the Micronesian megapode, Mariana fruit bat, humped tree snail, Micronesian gecko, *Solanum guamense*, *Dendrobium guamense*, and Ufa-halomtano require moist, native forests, while the Mariana common moorhen requires vegetated wetlands. Forested areas that were observed along the West route lacked an overall presence of epyphitic plants that would indicate potential for humped tree snail or *D. guamense* habitat and neither of these species were observed or detected during the 2018 surveys.

Surveys or monitoring for nests would be conducted during construction and active nests would be avoided, or other measures would be taken to avoid harming any migratory birds, nests, or eggs. In addition, USAF would implement measures agreed upon by USFWS and USAF for construction of facilities at the Tinian International Airport (USFWS 2013, USFWS 2015c) to reduce to a very low level the risk that a brown tree snake would be transported to Tinian during pipeline construction. Impacts are not expected on special status species from the operation of the fuel pipeline or support infrastructure.

A Biological Assessment containing the effect determinations for each species has been prepared by USAF (HDR 2018b). The Proposed Action will have no effect on terrestrial threatened and endangered species.

4.2.1.2.2 East Route

Vegetation. Long-term, minor, direct, impacts on vegetation are expected from pipeline construction along the East route. The West and East routes share a common path until the intersection of TR25 and TR24. The vegetation along the common path is primarily Mixed Introduced Forest and Tangantangan Forest along and near areas that have been disturbed previously.

If the pipeline were to be constructed along the East route, the ROI would be an estimated 128.78 acres. The utility easement for the pipeline has not yet been selected; therefore, the affected acreage is calculated based on the 2018 survey width, which in areas was 100 feet wide. The actual acreage of vegetation that would be affected during construction would be significantly less than 128.78 acres, especially because less than an 80-foot width is expected to be cleared for pipeline installation (see **Table 3.2-2**).

Much of the vegetation to be cleared along the East route is Tangantangan Forest (39 acres), Mixed Introduced Forest (34 acres), and Other Shrubs and Grass (22 acres). No vegetation communities that are rare and have a high diversity of native plant species, such as native limestone and strand forests, would be disturbed. Thus, construction of the pipeline would cause a minor reduction in native vegetation and little or no change in the diversity of vegetation

communities or composition of vegetation within those communities. Although sections of the East route do contain Mixed Introduced Forest with more native species observed than other portions of the project area, it is a relatively small area (less than 10 acres). Because much of the route has been previously disturbed, vegetation communities there are dominated by nonnative species, and native plants are uncommon, installation and operation of the pipeline would not cause a noticeable increase in invasive or other nonnative vegetation in the area.

Wildlife. Short-term, minor, direct impacts on native wildlife are expected from construction of the pipeline along the East route. In addition to the forested areas within the common paths for the West and East routes, the central portion of the East route that traverses north from TR24 contains forested areas where Tinian native forest birds such as the Mariana fruit dove, Micronesian starling, collared kingfisher, rufous fantail, and Tinian monarch, and other native and nonnative wildlife are more common. Pipeline construction would cause a long-term, permanent loss of habitat for those and other species. This forested area provides an insignificant amount of habitat for native wildlife considering there are over 11,000 acres of second growth forest vegetation on Tinian (Donnegan et al. 2011) available as habitat; therefore, the East route would result in the loss of a small amount of available suitable habitat on Tinian.

Migratory birds and other mobile wildlife would temporarily avoid areas along the pipeline route during construction. Smaller, less-mobile species and nesting birds could inadvertently be harmed during construction. To avoid harming nesting birds, surveys or monitoring during construction would be conducted and areas where active nests are found would be avoided, or other measures would be taken to avoid harming any migratory birds, nests, or eggs. Long-term, permanent impacts on native species of wildlife would be minor and negligible because very little habitat used by those species would be disturbed and because the species observed in the project area are abundant in surrounding areas.

As described in **Section 4.2.1.2.1**, control and interdiction methods would be implemented during construction of the pipeline to prevent the introduction of brown tree snakes and the spread of other invasive species.

Special-Status Species. Two fadang were observed during the 2018 survey along the southern edge of road TR26. The two individuals were planted as part of a decorative landscape for the Nanyo Kohatsu Kabushiki Kaisha Administration Building and Laboratory, which is listed on the NRHP. The proposed pipeline would be designed and sited to avoid the two individual fadang and the associated NRHP-listed property. The pipeline would be located within a proposed utility easement between the existing overhead electrical lines and road. During construction, crews and equipment would entirely avoid the NRHP-listed property and the two fadang within the landscaped area. Thus, construction and operation of the proposed fuel pipeline and support infrastructure, and roadway improvements would not affect fadang.

The Mixed Introduced Forest between TR24 and the airport could provide marginal habitat for humped tree snails and *D. guamense*. Although marginal habitat is present for both species, no snail shells were observed during surveys and no *D. guamense* were detected during surveys and an overall presence of epyphitic plants that would indicate potential for this species was lacking.

No other terrestrial species listed as threatened and endangered under the federal ESA or by CNMI (see **Table 3.2-2**) could be affected by pipeline construction along the East route. The pipeline would be constructed in Mixed Introduced Forest, Tangantangan Forests, mowed fields, Casuarina Thickets, or other disturbed areas (see **Table 3.2-2**). Threatened and endangered species occur on Tinian in native limestone forests, beachstrand forests, or wetlands, none of which exists within or near the East route (see **Table 3.2-2**).

Surveys or monitoring for nests would be conducted during construction and active nests would be avoided, or other measures would be taken to avoid harming any migratory birds, nests, or eggs. As described in **Section 4.2.1.2.1**, USAF would implement measures agreed upon by USFWS and USAF for construction of facilities at the Tinian International Airport (USFWS 2013, USFWS 2015c) to reduce to a very low-level risk that a brown tree snake would be transported to Tinian during pipeline construction.

A Biological Assessment containing the effect determinations for each species has been prepared by USAF (HDR 2018b). The Proposed Action will have no effect on terrestrial threatened and endangered species.

4.2.1.2.3 No Action Alternative

Under the No Action Alternative, USAF would not construct and operate the fuel pipeline or support infrastructure, but would construct a fuel storage tank at the seaport and use fuel trucks to transport fuel from the seaport to the airport. Under this alternative, no vegetation along a pipeline route would be disturbed and there would be no loss of or disturbance of wildlife habitat along a pipeline route; impacts on vegetation and wildlife would be less than under the Proposed Action.

4.2.1.3 Roadway Improvements

4.2.1.3.1 Proposed Action

Vegetation. All improvements are expected to occur within the roadbeds and shoulders. Vegetation along the edges of the roads consists of nonnative shrubs, grasses, and vines. All of the roads have been or continue to be disturbed by public use and general maintenance. Thus, roadway improvements would have no or negligible, short-term, direct impacts on native vegetation.

Wildlife. All roadway improvements would occur within the existing roadbeds and shoulders, and few or no areas where birds nest or other native wildlife is found would be disturbed. Thus, roadway improvements would have no or negligible, short-term, direct impacts on native wildlife.

Special-Status Species. Roadway improvements would be conducted entirely within the existing roadbeds and shoulders and would not affect species listed as threatened and endangered under the federal ESA or by CNMI (see **Table 3.2-2**).

Wetlands. There are no wetlands within or near the roadways proposed for improvements.

4.2.1.3.2 No Action Alternative

Under the No Action Alternative, only minor roadway repairs along the construction and fuel truck routes would occur, as was considered in the 2016 Divert EIS (Final EIS, Section 4.11.2). Minor roadway repairs associated with routine use would have no impact on terrestrial biological resources.

4.2.2 Marine Biological Resources

4.2.2.1 Analysis Methodology

As mentioned in **Section 3.2.2**, the Proposed Actions would occur entirely on land, with no activities occurring in marine environments. Therefore all impacts analyzed are considered indirect as a result of construction or operation.

Impacts on marine biological resources were assessed using the potential following outcomes:

- Permanent loss of habitat
- Temporary loss or modification of habitat that affects a substantial number of a species
- Permanent loss of feeding and breeding areas of a federal-listed species
- Temporary loss or modification of feeding and breeding areas that affects a substantial number of individuals of a species
- Substantial interference with movement of any resident species that results in the inability of the species to survive.

As discussed in **Sections 4.7.1** and **4.8.1** and **Appendix F**, DOD policies, compliant with federal and CNMI regulations, would be followed to minimize erosion and sedimentation during construction and to manage stormwater runoff after construction. By implementing those policies, impacts of sedimentation and runoff would be minor. EFH, coral species, and other nearshore resources are considered in the context of these potential indirect effects. Marine biological resources considered also include special status sea turtles and marine mammals that could be indirectly affected by the Proposed Actions.

To comply with Section 7 of the ESA, USAF prepared a Biological Assessment (see **Appendix D**) that evaluates the effects of the Proposed Actions on federally listed proposed, threatened, and endangered marine species. USAF determined in the Biological Assessment that the Proposed Actions may affect, but are not likely to adversely affect, federally listed proposed, threatened, and endangered marine species. On November 19, 2018, NMFS concurred with the USAF determination that the Proposed Actions are not likely to adversely affect federally listed proposed, threatened, and endangered marine species (see **Appendix D**).

To comply with MSFCMA, USAF prepared an EFH Assessment that evaluates the effects of the Proposed Actions on EFH. USAF determined in the EFH Assessment that the Proposed Actions would have no to minimal adverse effect to EFH. On April 29, 2019, NMFS concurred with this determination.

4.2.2.2 Pipeline and Support Infrastructure

4.2.2.2.1 West and East Routes

Nearshore Marine Resources. Short-term, indirect, negligible impacts on nearshore marine resources could occur from sedimentation, runoff, and potential spills during the construction of the fuel pipeline and support infrastructure. USAF would implement compliance actions and industry standards for erosion and sediment control, stormwater management, and spill prevention and control during construction discussed in more detail in **Appendix F**. By implementing these measures, the release of fresh water, sediment, and hazardous materials from the project areas into the marine environment during construction would be avoided or minimized.

Long-term, negligible, indirect impacts on nearshore marine resources could occur as a result of underground fuel pipeline spills during pipeline and support infrastructure operation. However, as stated in **Section 2.2**, the fuel pipeline and fuel facilities would be constructed in accordance with seismic requirements, including those for seismic loads outlined in American Society of Civil Engineers Standard 7-10 *Minimum Design Loads for Buildings and Other Structures* and UFC 3-310-04 *Seismic Design for Building* to reduce the potential for a spill that could result from geologic hazards associated with slope instability (i.e., landslides), seismic activity, and liquefaction. In the unlikely event of a fuel spill, measures described in **Appendix F** would be implemented to avoid or minimize these impacts on marine resources.

Essential Fish Habitat. Short-term, no to minor, indirect impacts on EFH would be expected during pipeline and support infrastructure construction. Sedimentation, runoff, and potential spills during the construction and operation of the fuel pipeline could occur. USAF prepared an EFH Assessment regarding the Proposed Action and measures for sedimentation, runoff, and potential spills during construction would be implemented such as those provided in **Appendix F**. Under the MSFCMA, USAF determined in the EFH Assessment that the Proposed Actions would have no to minimal adverse effect to EFH. On April 29, 2019, NMFS concurred with this determination.

Long-term, negligible, indirect impacts on EFH could occur as a result of underground fuel pipeline spills during pipeline and support infrastructure operation. However, as stated in **Section 2.2**, the fuel pipeline and fuel facilities would be constructed in accordance with seismic requirements, including those for seismic loads outlined in American Society of Civil Engineers Standard 7-10 *Minimum Design Loads for Buildings and Other Structures* and UFC 3-310-04 *Seismic Design for Building* to reduce the potential for a spill that could result from geologic hazards associated with slope instability (i.e., landslides), seismic activity, and liquefaction. In the unlikely event of a fuel spill, measures described in **Appendix F** would be implemented to avoid or minimize these impacts on marine resources.

Threatened and Endangered Species. Short-term, negligible to minor, indirect impacts on marine threatened and endangered species would be expected during pipeline and support infrastructure construction. Sedimentation, runoff, and potential spills during the construction and operation of the fuel pipeline could occur. USAF developed a Biological Assessment (see **Appendix D**) to evaluate the effects of the Proposed Actions on federally listed proposed, threatened, and endangered marine species. USAF determined that the Proposed Action may

affect, but is not likely to adversely affect, marine threatened and endangered species; NMFS concurred with this determination on November 19, 2018. Measures for sedimentation, runoff, and potential spills during construction and operation will be identified in the effects determination, such as those provided in **Appendix F**.

Long-term, negligible, indirect impacts on marine threatened and endangered species could occur as a result of underground fuel pipeline spills. However, as stated in **Section 2.2**, the fuel pipeline and fuel facilities would be constructed in accordance with seismic requirements, including those for seismic loads outlined in American Society of Civil Engineers Standard 7-10 *Minimum Design Loads for Buildings and Other Structures* and UFC 3-310-04 *Seismic Design for Building* to reduce the potential for a spill that could result from geologic hazards associated with slope instability (i.e., landslides), seismic activity, and liquefaction. In the unlikely event of a fuel spill, measures described in **Appendix F** would be implemented to avoid or minimize these impacts on marine resources.

4.2.2.2.2 No Action Alternatives

Under the No Action Alternative, USAF would not construct and operate the fuel pipeline or support infrastructure, but would construct a fuel storage tank at the seaport and use fuel trucks to transport fuel from the seaport to the airport. Greater impacts on marine species from potential fuel spills would be expected because spills and leaks from trucks are more common than from pipelines (Strata 2017).

4.2.2.3 Roadway Improvements

4.2.2.3.1 Proposed Action

Nearshore Marine Resources. Short-term, indirect, negligible impacts on nearshore marine resources could occur from sedimentation, runoff, and potential spills during the construction of the roadway improvements. USAF would implement compliance actions and industry standards for erosion and sediment control, stormwater management, and spill prevention and control during construction discussed in more detail in **Appendix F**. By implementing these measures, the release of fresh water, sediment, and hazardous materials from the project area into the marine environment during construction would be avoided or minimized.

Essential Fish Habitat. Short-term, no to negligible, indirect impacts on EFH would be expected during construction of the roadway improvements. Sedimentation, runoff, and potential spills during the construction could occur. USAF prepared an EFH Assessment regarding the Proposed Action and measures for sedimentation, runoff, and potential spills during construction would be implemented such as those provided in **Appendix F**. Under the MSFCMA, USAF determined in the EFH Assessment that the Proposed Actions would have no to minimal adverse effect to EFH. On April 29, 2019, NMFS concurred with this determination.

Threatened and Endangered Species. Short-term, negligible, indirect impacts on marine threatened and endangered species would be expected during roadway improvements construction. Sedimentation, runoff, and potential spills during the construction could occur. USAF developed a Biological Assessment (see **Appendix D**) to evaluate the effects of the Proposed Actions on federally listed proposed, threatened, and endangered marine species. USAF determined that the Proposed Action may affect, but is not likely to adversely affect,

marine threatened and endangered species; NMFS concurred with this determination on November 19, 2018. Measures for sedimentation, runoff, and potential spills during construction will be identified in the effects determination, such as those provided in **Appendix F**.

4.2.2.3.2 No Action Alternative

Under the No Action Alternative, only minor roadway repairs along the construction and fuel truck routes would occur, as was considered in the 2016 Divert EIS (Final EIS, Section 4.11.2). Under the No Action Alternative, minor roadway repairs associated with routine use would have no impact on terrestrial or marine biological resources.

4.2.3 Summary of Impacts

4.2.3.1 Proposed Actions and Alternatives

The Proposed Actions would have short- to long-term, negligible to moderate impacts on terrestrial and marine biological resources. The majority of impacts would be generated from the removal of vegetation and wildlife habitat for construction of the pipeline, and impacts would be similar across both the West and East routes. USAF would implement compliance actions and industry standards for erosion and sediment control, stormwater management, and spill prevention and control during construction and operation, discussed in more detail in **Appendix F**, to minimize or eliminate the potential for impacts from stormwater runoff or spills. USAF would also implement measures agreed upon by USFWS and USAF for construction of facilities at the Tinian International Airport (USFWS 2013, USFWS 2015c) to reduce to a very low-level risk that a brown tree snake would be transported to Tinian during pipeline or road improvements construction. No adverse effects, as defined under Section 7 of the ESA, on terrestrial or marine special status species are expected to occur.

4.2.3.2 No Action Alternatives

Under the No Action Alternatives, USAF would not construct and operate the fuel pipeline and support infrastructure, and would not construct roadway improvements; however, USAF would construct a fuel storage tank at the seaport, complete only minor road repairs, and use fuel trucks to transport fuel from the seaport to the airport. Under the No Action Alternatives, impacts on biological resources would be expected from construction at the seaport and use of fuel trucks to transfer fuel and the potential for a spill during transfer.

4.3 Cultural Resources

4.3.1 Analysis Methodology

Impact analysis for cultural resources in this SEIS focuses on assessing whether an action alternative has the potential to affect cultural resources that are eligible for listing in the NRHP. Under the NHPA, an adverse effect is any action that might directly or indirectly change the characteristics that make the historic property eligible for listing in the NRHP. Such impacts can occur by physically altering, damaging, or destroying all or part of a resource; altering characteristics of the surrounding environment that contribute to the resource's significance; introducing visual or audible elements that are out of character with the property or alter its

setting; or neglecting the resource to the extent that it deteriorates or is destroyed. During Section 106 consultation on the Divert Activities and Exercises undertaking concurrent with the 2016 Divert EIS, the consulting parties agreed that a distinction between direct effects and indirect effects was not necessary, and both types of effects constitute an adverse effect (Final EIS, Section 4.8). Therefore, the decision was made to remove the distinction between direct and indirect impacts in the 2016 Divert EIS (Final EIS, Section 4.8) and this SEIS.

As part of the Section 106 process, USAF determined the Tinian Divert Infrastructure Improvements would contribute to adverse effects on historic properties from the Divert Activities and Exercises undertaking. Members of the public were invited to comment on this finding during the public comment period on the Draft SEIS.

USAF has concluded its Section 106 consultation on the Tinian Divert Infrastructure Improvements by amending the Programmatic Agreement among the Pacific Air Forces, Directorate of the Strategy, Plans, and Programs, the Commonwealth of the Northern Mariana Islands State Historic Preservation Office, and the Advisory Council on Historic Preservation Regarding the Proposed Construction and Operation of Divert Activities and Exercises within the Commonwealth of the Northern Mariana Islands. The Amendment, executed on March 3, 2020, describes the undertaking and associated APE, identifies historic properties in the APE, and stipulates measures applicable to the undertaking. **Appendix C** contains materials related to the cultural resources investigations and Section 106 consultation process.

4.3.2 Pipeline and Support Infrastructure

4.3.2.1 West Route

Construction and operation of the pipeline along the West route would have short- to long-term, minor to moderate impacts on cultural resources. Ground disturbance during construction of the pipeline would have the potential to affect the physical integrity of historic properties, having minor to moderate impacts on the sites. Construction would also have short-term, minor to moderate impacts on the historic setting or feeling of the properties. To mitigate impacts on historic properties, USAF would complete development of an Interpretive Plan to document and interpret the prehistory and history of the Divert Activities and Exercises APE, including the area affected by the Tinian Divert Infrastructure Improvements project, for the public. Impacts from operation of the pipeline are not expected.

Four historic properties were identified in the APE that could be affected by construction of the pipeline along the West route: archaeological sites TN-6-0030, HDR-18-07, TN-4-1010, and the Tinian Harbor. Site TN-5-0690 was also identified in the APE in background research; however, the site was not found during cultural resource surveys and appears to be outside the APE or destroyed. Similarly, no archaeological deposits or features associated with site SC-5043 are within the APE.

Construction of the West route would have short- to long-term, minor to moderate impacts on site TN-6-0030, West Field. The pipeline would be installed into Runway 1 and would include areas of disturbance in addition to the land requirement presented in the 2016 Divert EIS (Final EIS, Section 2.5.2). Historic pavement would be removed within the pipeline trench and any pits and would be replaced with new material after the pipeline is installed. Construction would

further detract from the site's historic character and tracked heavy equipment could affect the paved surface of the runway outside of the trench. Impacts on the site would be greatest during active construction when equipment is present onsite and the pipeline trench is open. To minimize long-term impacts, USAF would, to the extent practical, minimize the use of steel-tracked equipment on intact airfield pavements and repair airport pavements affected by fuel pipeline construction in accordance with the Secretary of the Interior's *Guidelines for the Treatment of Historic Properties*. Such treatment would only occur in areas outside of Divert infrastructure footprints analyzed in the 2016 Divert EIS (Final EIS, Section 2.5.2).

The West route could have long-term, moderate or short-term minor impacts on site HDR-18-07. USAF would design the pipeline to avoid the site if practicable, and short-term minor impacts on the site from visual disturbance, noise, and possible ground disturbance during nearby construction would be expected. However, if avoidance of site HDR-18-07 is not practicable, USAF would conduct data recovery of the site. In this case, the alternative would have a long-term, moderate impact on site HDR-18-07.

The West route would also have short-term, minor impacts on site TN-4-1010 due to visual disturbance, noise, and possible ground disturbance during construction. USAF would design the pipeline to avoid site TN-4-1010 and no long-term impacts would occur.

The West route would have no impact on the Tinian Harbor. The USAF would use the existing seaport bulk receipt header and new pipeline construction would be consistent with other modern alterations and facilities in the immediate vicinity.

Based on the results of the Phase I survey and previous cultural resources work in the APE, USAF determined that portions of the West route have potential to contain unidentified cultural resources, including the possibility for burials and human remains. Prior to construction, USAF would assess the feasibility and effectiveness of conducting a geophysical survey in areas with moderate to high potential for containing subsurface remains as shown in **Figure 3.3-1**. The survey would be for the purpose of detecting subsurface anomalies that may represent buried archaeological features or human remains, and enabling avoidance of such anomalies. If the geophysical survey is determined to be feasible and effective, USAF would develop and implement a Geophysical Survey Work Plan, and, to the extent practical, adjust the routing of the fuel pipeline to avoid anomalies identified in the geophysical survey. USAF also would coordinate identification of subsurface historic properties with clearance of munitions and explosives of concern in areas within the APE identified as having moderate to high potential for buried archaeological deposits in **Figure 3.3-1**. That is, archaeologists would be present during munitions clearing activities and would work with these technicians to determine whether buried archaeological deposits are present, and investigate any identified deposits as appropriate.

Operation of the pipeline is not expected to impact historic properties along the West route. In the unlikely event of a spill, ground disturbance to repair the pipeline would be expected to occur within the limits of disturbance during pipeline construction. Additional impacts on known historic properties or buried archaeological sites could occur if soils outside the limits of disturbance must be removed for decontamination. In the event of unanticipated adverse effects on historic properties, USAF would conduct additional consultation under the PA to

resolve the effects. Impacts would not be expected on traditional hunting areas or fishing grounds.

Construction and operation of seaport support infrastructure is not expected to impact cultural resources. No historic properties were identified in the APE for the seaport support infrastructure area. Based on the results of the Phase I survey and previous cultural resources work in the APE, USAF determined that the area around the seaport support infrastructure has potential to contain unidentified cultural resources, including the possibility for burials and human remains. Following Typhoon Yutu, this area was modified for use as a materials and equipment staging area for recovery efforts, including the creation of graveled surface area. It is unknown whether this activity has affected the subsurface potential in this area, although it is likely that deeper strata would be unaffected. USAF would implement the same measures for the seaport area as those identified for the portions of the West route with the potential to contain unidentified cultural resources, including the possibility for burials and human remains. No traditional resources occur in the seaport support infrastructure area. These impacts are consistent with what was analyzed in the 2016 Divert EIS (Final EIS, Section 4.8.2).

4.3.2.2 East Route

Impacts on cultural resources along the East route would be similar to those described for the West route because all historic properties identified in the APE are in areas where the two routes have a shared alignment. To mitigate impacts on historic properties, USAF would complete development of an Interpretive Plan to document and interpret the prehistory and history of the Divert Activities and Exercises APE, including the area affected by the Tinian Divert Infrastructure Improvements project, for the public.

The East route involves a greater length of pipeline within site TN-6-0030, West Field, and impacts on this resource from construction of the East route would be slightly greater. Under the East route, the pipeline would be constructed within paved elements of the historic airfield south of the Tinian International Airport as well as Runway 1 north of the airport. Affected southern elements include 0.84 mile of taxiway and several hardstands. As with the West route, historic pavement would be removed within the pipeline trench and any pits would be replaced with new material after the pipeline is installed. Construction would further detract from the site's historic character and tracked heavy equipment could affect the paved surface of the runway outside of the trench. Impacts on the site would be greatest during active construction when equipment is present onsite and the pipeline trench is open. To minimize long-term impacts, USAF would, to the extent practical, minimize the use of steel-tracked equipment on intact airfield pavements and repair airport pavements affected by fuel pipeline construction in accordance with the Secretary of the Interior's *Guidelines for the Treatment of Historic Properties*.

As with the West route, long-term, moderate or short-term, minor impacts are possible at site HDR-18-07. USAF would avoid the site if practicable and short-term minor impacts would be expected; however, if avoidance is not practicable, USAF would conduct data recovery at the site and the alternative would have a long-term, moderate impact. Short-term, minor impacts would be expected on site TN-4-1010 due to construction and noise. No impacts would be expected on the historic Tinian Harbor.

Portions of the East route have the potential to contain unidentified cultural resources, including the possibility for burials and human remains. Prior to construction, USAF would assess the feasibility and effectiveness of conducting a geophysical survey in areas with moderate to high potential for containing subsurface remains as shown in **Figure 3.3-1**. The survey would be for the purpose of detecting subsurface anomalies that may represent buried archaeological features or human remains, and enabling avoidance of such anomalies. If the geophysical survey is determined to be feasible and effective, USAF would develop and implement a Geophysical Survey Work Plan, and, to the extent practical, adjust the routing of the fuel pipeline to avoid anomalies identified in the geophysical survey. USAF also would coordinate identification of subsurface historic properties with clearance of munitions and explosives of concern in areas within the APE identified as having moderate to high potential for buried archaeological deposits in **Figure 3.3-1**. That is, archaeologists would be present during munitions clearing activities and would work with these technicians to determine whether buried archaeological deposits are present, and investigate any identified deposits as appropriate.

Pipeline operations are not expected to impact cultural resources along the East route. In the unlikely event of a spill or leak, ground disturbance to repair the pipeline would be expected to occur within the limits of previous disturbance. Additional impacts could occur if soil decontamination is required beyond the limits of disturbance. In the event of unanticipated adverse effects on historic properties, USAF would conduct additional consultation under the PA to resolve the effects.

Construction and operation of seaport support infrastructure is not expected to impact cultural resources and would be the same as described for the West route.

4.3.2.3 No Action Alternative

Under the No Action Alternative, USAF would not construct and operate the fuel pipeline or support infrastructure, but would construct a fuel storage tank at the seaport and use fuel trucks to transport fuel from the seaport to the airport. Short-term impacts from construction noise and activities would not occur at sites TN-6-0030, TN-4-1010, or HDR-18-07, and additional long-term impacts from pipeline construction would not occur at TN-6-0030 (West Field). Impacts at West Field would still result from construction and operation of Divert infrastructure analyzed in the 2016 Divert EIS (Final EIS, Section 4.8.2). As presented in the 2016 Divert EIS (Final EIS, Section 4.8.2), construction of the fuel tanks and fuel truck traffic would have no impact on cultural resources.

4.3.3 Roadway Improvements

4.3.3.1 Proposed Action

Roadway improvements would have potential to impact cultural resources during excavation and ground disturbance within the roadway and limited surface disturbance from foot and vehicle traffic within 5 feet of the roadway. Cultural resources surveys in proposed road improvement areas did not identify any historic properties. Previous cultural resource monitoring projects indicate buried archaeological sites and human remains may occur beneath potential disturbance areas. However, the proposed road improvements are not expected to encounter these resources because excavations would be limited to a depth of 12 inches within

existing paved roadways. If inadvertent discoveries of buried archaeological deposits or human remains were to occur during construction, USAF would implement the procedures for inadvertent discoveries in the 2016 Divert PA. Although the roadway improvements would have no impacts on historic properties, these areas were defined in the Section 106 process as part of the Divert Activities and Exercises APE and therefore would be included in USAF's development of an Interpretive Plan to document and interpret the prehistory and history of the Divert Activities and Exercises APE for the public.

4.3.3.2 No Action Alternative

Under the No Action Alternative, only minor roadway repairs along the construction and fuel truck routes would occur as considered in the 2016 Divert EIS. These minor roadway repairs would have no impact on cultural resources.

4.3.4 Summary of Impacts

4.3.4.1 Proposed Actions and Alternatives

The Proposed Actions would have short-term to long-term, minor to moderate impacts on cultural resources. The majority of impacts would be generated from construction of the pipeline, and impacts would be similar across both the West route and East route because all identified historic properties occur in areas shared among both routes. However, the East route would have slightly greater impacts on site TN-6-0030, West Field, due to the greater extent of pipeline that would affect historic features of this site. Construction of roadway improvements and operation of the pipeline and seaport support infrastructure would not be expected to impact cultural resources.

4.3.4.2 No Action Alternatives

Under the No Action Alternatives, USAF would not construct and operate the fuel pipeline and support infrastructure, and would not construct roadway improvements; USAF would construct a fuel storage tank at the seaport, complete only minor road repairs, and use fuel trucks to transport fuel from the seaport to the airport. Under the No Action Alternatives, no impact on cultural resources would be expected.

4.4 Socioeconomics

4.4.1 Analysis Methodology

Impacts on socioeconomics were assessed to determine if the Proposed Actions and alternatives resulted in any of the following:

- Substantial change in the local or regional population, housing, public services (health, police, and fire services), or in social conditions from the demands of additional population or population shifts
- Substantial change in the local or regional economy, employment, or spending or earning patterns.

4.4.2 Pipeline and Support Infrastructure

4.4.2.1 West Route

Population Characteristics. Short-term, moderate impacts on the population of Tinian would result from construction of the pipeline along the West route. An addition of 75 construction workers to Tinian would increase the population by 2.5 percent. However, if the 150 construction workers required during peak construction for the original Divert project are also working on Tinian as described in the 2016 Divert EIS (Final EIS, Section 2.5.2), then the island population would be 7.4 percent higher. However, this increase would be sustained for a limited time. There is precedent for large, temporary population increases on Tinian as approximately 1,800 mostly foreign workers spent 18 months on the island during construction of the Tinian Dynasty Hotel and Casino in the late 1990s (DON 2015b).

While the specific source of construction workers is unknown, it is assumed most workers would be from Saipan, Guam, and the Federated States of Micronesia. While it is likely that the majority of construction workers would be from Saipan or Guam, workers from outside of the CNMI and Guam could be required during peak work periods and for some specialty tasks. The CW-1 permit program for nonimmigrant transitional foreign workers was recently extended through December 31, 2029, and the CW-1 permit cap was increased from 4,999 to 13,000 (U.S. Citizen and Immigration Services 2018). Foreign construction workers, including alien and H2B workers, would be required to comply with the requirements of 48 U.S.C. Sec. 1806(b) for work in the CNMI. An increase in population from construction workers is not considered a direct impact; however, it has the potential to result in indirect, adverse and beneficial impacts on other socioeconomic factors as discussed in the following subsections.

No long-term impacts on Tinian's population would occur during operation of the West route pipeline because there would be no anticipated permanent population increases. Any personnel required for maintenance and operation of the pipeline and fuels infrastructure would be supported by the exercise and support personnel (e.g., security guards) analyzed in the 2016 Divert EIS (Final EIS, Section 4.14.2.2). It is assumed that any additional personnel required to inspect and maintain the pipeline would be negligible (e.g., 0 to 5 personnel) and would be from on-island.

Economic Characteristics. Short-term, moderate, direct and indirect, beneficial impacts on the local economy would occur from construction of the pipeline along the West route.

Disruption of traffic along the West route, particularly TR26, 6th Avenue, and TR25, during construction could cause delays for delivery trucks and persons traveling north to visit cultural and historic sites, but the roadways would remain open. Therefore, there would be no impacts on the local economy.

Short-term, moderate, beneficial impacts on the local economy would be expected from construction of the West route. Construction would result in increases of employment, purchase of goods and services, and tax revenue. Impacts on economic conditions in Tinian would occur due to the presence of construction workers and in Saipan or Guam where most construction materials would be sourced. The increase in employment would result in increased wages paid. Based on a survey of wages and salaries in the CNMI, construction and extraction occupations

earned an average direct wage of $7.60 per hour, with other specialized, technical, and managerial positions earning more (CNMI Department of Commerce 2017b). Therefore, it is assumed that each worker would be paid at least $304 per week. Increased wages would in turn increase government revenue from employment taxes (wage and salary tax [Chapter 2 tax] and Northern Marianas territorial income tax [NMTIT]).

Construction would increase demand for and purchase of local and regional supplies, materials, and services. Most supplies, such as construction supplies and materials, would need to be purchased in Saipan or Guam and shipped to Tinian. However, some supplies, including food, water, and fuel, could be purchased from local businesses. Local contractors would provide services such as construction equipment/vehicle maintenance; bus transportation of workers; and disposal of solid, liquid, and hazardous wastes from work sites. In addition, temporary housing would be needed and would require renting houses/rooms or purchasing rooms at local hotels that would contribute to beneficial impacts on the local economy.

The increase of up to 75 additional construction workers on Tinian could also create a short-term, moderate, beneficial impact on the local economy by increasing local business sales volume and spending on tourist activities. Local construction workers from the CNMI might be more inclined to buy products and services in the local economy when they are earning a steady income. However, it is likely that expenditures by foreign construction workers would be minimal as foreign workers send much of their incomes back to their home countries through remittances (U.S. GAO 2000). Based on the volume of increased sales, there could be secondary increases in employment and income generated from local businesses.

Negligible impacts on the local economy are expected from operation of the West route. Any parts or services that are needed for periodic maintenance and repair would be minimal and likely be purchased from off-island sources. Personnel for maintenance and operation of the pipeline and fuels infrastructure would be supported by the exercise and support personnel (e.g., security guards) analyzed in the 2016 Divert EIS (Final EIS, Section 4.14.2.2). It is assumed that any additional personnel required to inspect and maintain the pipeline would be negligible (e.g., 0 to 5 personnel) and would be from on-island, resulting in long-term negligible beneficial impacts on employment.

Housing. Short-term, moderate impacts on housing would occur during construction of the West route. In 2010, there were 244 vacant housing units on Tinian (USCB 2010b). However, it is assumed that fewer than 244 housing units would be available because of damage from Typhoon Yutu. The construction contractor would be responsible for providing housing for construction workers and securing the required number of rooms for all workers prior to construction. The construction contractor could consider using commercial lodging, vacant housing units, and newly constructed or repaired non-hotel housing units. Workers from outside of Tinian also could be housed on Saipan and commute to Tinian daily. All travel to and from Tinian by construction workers would be on existing commercial flights or carriers, and additional flights would not be required. The ability of the Tinian hotel and housing market to provide the necessary amount of rooms for sustained periods would decrease the longer construction lasts and the longer the peak level of rooms was needed.

No impacts on housing on Tinian would occur during operation of the West route. Because it is assumed there would be no permanent population increases or additional personnel hired from off-island, no long-term housing would be required as part of the Proposed Action.

Public Services. Short-term, moderate impacts on public services could result from increased demand placed on local health/medical, law enforcement, and firefighting services from the influx of new construction workers to Tinian. Tinian would need to accommodate the increased demands for public services associated with a 2.5 percent to 7.4 percent population increase, as described under ***Population Characteristics*** for a limited time.

Due to the small scale of the Tinian Health Center, it could not be able to manage the increased demand adequately. To minimize the impacts on the Tinian Health Center, the construction contractor would be responsible for medical care for construction personnel during peak work periods. Similarly, the DPS would experience increased demands for law enforcement and firefighting services. While there is precedent for continuing to provide adequate police and firefighting services during periods when the island's population experiences large increases (i.e., during construction of the Tinian Dynasty Hotel and Casino), it is possible that additional security and fire personnel could be required to rectify the increased demand during construction of the West route.

The magnitude of the impact on public services is based on the largest population increase and not necessarily the duration over which these increases would need to be sustained. Therefore, the impacts on public services would be moderate during construction of the West route pipeline.

There would be no impacts on public services from operation of the West route pipeline because it is assumed there would be no permanent population increases creating increased demand on the services.

Sociocultural Issues. Short-term, minor sociocultural impacts could occur during construction of the pipeline along the West route. Portions of pipeline construction at Tinian International Airport and the Tinian seaport would occur on public land acquired or leased by USAF and proposed for construction in the 2016 Divert EIS (Final EIS, Section 2.5.2). The pipeline also would be constructed on public land and within easement rights held by the U.S. federal government that allow it to install, operate, and maintain fuel infrastructure and other utilities. Portions of the utility easement for the pipeline would also fall within existing CNMI ROWs for roadways and utilities. None of these public lands are currently proposed for homesteads and existing ROWs are not suitable for residential or agricultural homestead; therefore, no land that might be homesteaded would be affected.

While construction would bring up to 75 people to Tinian during peak work periods, a majority of these workers likely would be from the CNMI and Guam and respectful of local culture and customs. Therefore, it is unlikely that there would be any significant conflicts with local Tinian residents. There would be no impacts on sociocultural issues from operation of the West route. Operation of the pipeline would not require new restricted access areas and it is assumed no additional personnel would be required to move to the area.

Construction and operation of the pipeline support infrastructure at the Tinian seaport would not disrupt any port operations. Impacts on socioeconomics from construction of the seaport facilities are discussed as part of the pipeline construction. No impacts on socioeconomics are expected from operation of the seaport support infrastructure.

4.4.2.2 East Route

Population Characteristics. Construction of the pipeline along the East route would be similar to that described under the West route, except the East route is 0.86 mile longer and, therefore, workers would be on Tinian for a slightly longer time. The East route construction would not require additional workers beyond the 75 peak workers identified for the West route. Therefore, short-term, moderate impacts on the population of Tinian would be expected during pipeline construction. No impacts on Tinian's population would occur from operation of the East route because it is assumed no additional personnel would be hired from off-island as part of the Proposed Action.

Economic Characteristics. Construction of the pipeline along the East route would be similar to that described under the West route, except the East route is 0.86 mile longer, which would require more materials and workers would be on Tinian for a slightly longer time. Therefore, additional construction supplies and material might be required and construction workers would continue to make purchase in the local community for a longer period of time. However, impacts would be the same as those of the West route pipeline, and short-term, moderate, direct and indirect, beneficial impacts on the local economy would be expected.

Negligible impacts on the local economy are expected from operation of the East route. It is assumed if additional personnel would be required for inspection and maintenance they would be hired from on island, which would have a negligible beneficial impact on employment. Any parts or services needed for periodic maintenance and repair would be minimal and likely be purchased from off-island sources.

Housing. Construction of the pipeline along the East route would be similar to that described under the West route, except workers would be on Tinian for a slightly longer time. Short-term, moderate impacts on housing would be expected during construction of the East route.

No impacts on housing would occur during operation of the East route because it is assumed no long-term housing would be required as part of the Proposed Action.

Public Services. Construction of the pipeline along the East route would be similar to that described under the West route, except workers would be on Tinian for a slightly longer time. Short-term, moderate impacts on public services would be expected during construction of the East route.

No impacts on Tinian's public services would occur from operation of the East route because there would be no increased demand on these services as it is assumed no additional personnel would be hired from off-island.

Sociocultural Issues. Construction of the pipeline along the East route would be similar to that described under the West route, except workers would be on Tinian for a slightly longer time. Short-term, minor sociocultural impacts would be expected.

Similar to the West route, there would be no impacts on sociocultural issues from operation of the East route.

Construction and operation of the pipeline support infrastructure at the Tinian seaport would not disrupt any port operations. Impacts on socioeconomics from construction of the seaport facilities are discussed as part of the pipeline construction. No impacts on socioeconomics are expected from operation of the seaport support infrastructure.

4.4.2.3 No Action Alternative

Under the No Action Alternative, USAF would not construct and operate the fuel pipeline or support infrastructure, but would construct a fuel storage tank at the seaport and use fuel trucks to transport fuel from the seaport to the airport. It is expected that the No Action Alternative would require less construction because only storage tanks would be constructed at the seaport instead of a pipeline and support infrastructure, which would result in a shorter construction period, fewer purchases of construction materials and services by the construction contractor, and fewer purchases of goods and services in the community by construction workers. Therefore, the No Action Alternative would not have an impact on existing socioeconomic conditions. Beneficial impacts would be expected from the operation of the fuel trucks and vehicle fuel purchases. The No Action Alternative would occur within the context of the original Divert construction and, therefore, demand for public services and changes in sociocultural issues would not change from existing conditions.

4.4.3 Roadway Improvements

4.4.3.1 Proposed Action

Population Characteristics. Short-term, minor to moderate impacts on the population of Tinian would result from construction of roadway improvements. An addition of 25 people to Tinian would increase the population by 0.8 percent. However, if the 150 construction workers required during peak construction for the original Divert project are also working on Tinian, then the island population would be 5.7 percent higher. Therefore, an increase of the Tinian population of up to approximately 0.8 percent to 5.7 percent would be experienced during construction due to the Proposed Action and the original Divert construction, but this increase would be sustained for a limited time.

While the specific source of construction workers is unknown, it is assumed most workers would be from Saipan, Guam, and the Federated States of Micronesia. The CW-1 permit program for nonimmigrant transitional foreign workers was recently extended through December 31, 2029, and the CW-1 permit cap was increased from 4,999 to 13,000 (U.S. Citizen and Immigration Services 2018). While it is likely that the majority of construction workers would be from Saipan or Guam, workers from outside of the CNMI would be required during peak work periods and for some specialty tasks. An increase in population is not considered a direct impact; however, it

has the potential to result in indirect, adverse and beneficial impacts on other socioeconomic factors as discussed in the following subsections.

Economic Characteristics. Short-term, minor to moderate, direct and indirect, beneficial impacts on the local economy would occur from construction of the roadway improvements.

Disruption of traffic along the route of roadway improvements, particularly TR24 and TR25, could cause delays for delivery trucks and persons traveling north to the airport or to visit cultural and historic sites, but the roadways would remain open. Therefore, there would be no impacts on the local economy.

Short-term, minor to moderate, beneficial impacts on the local economy would be expected from construction of the roadway improvements. Construction would result in increases of employment, purchase of goods and services, and tax revenue. Impacts on economic conditions in Tinian would occur due to the presence of construction workers and in Saipan or Guam where most construction materials would be sourced. The increase in employment resulting from this alternative would result in increased wages paid. Based on a survey of wages and salaries in the CNMI, construction and extraction occupations earned an average direct wage of $7.60 per hour, with other specialized, technical, and managerial positions earning more (CNMI Department of Commerce 2017b). Therefore, it is assumed that each worker would be paid at least $304 per week. Increased wages would in turn increase government revenue from employment taxes (wage and salary tax [Chapter 2 tax] and NMTIT).

Construction would increase demand for and purchase of local and regional supplies, materials, and services. Most supplies, such as construction supplies and materials, would need to be purchased in Saipan or Guam and shipped to Tinian. However, some supplies, including food, water, and fuel, could be purchased from local businesses. Local contractors would provide services such as construction equipment/vehicle maintenance; bus transportation of workers; and disposal of solid, liquid, and hazardous wastes from work sites. In addition, temporary housing would be needed and would require renting houses/rooms or purchasing rooms at local hotels that would contribute to beneficial impacts on the local economy.

The increase of up to 25 additional people on Tinian in the form of construction workers could also create a short-term, minor, beneficial impact on the local economy by increasing local business sales volume and spending on tourist activities. Local construction workers from the CNMI might be more inclined to buy products and services in the local economy when they are earning a steady income. However, it is likely that expenditures by foreign construction workers would be minimal as foreign workers send much of their incomes back to their home countries through remittances (U.S. GAO 2000).

Housing. Short-term, minor to moderate impacts on housing would occur during construction of the roadway improvements. Short-term, moderate impacts on housing would occur during construction of the roadway improvements. In 2010, there were 244 vacant housing units on Tinian (USCB 2010b). However, it is assumed that fewer than 244 housing units would be available because of damage from Typhoon Yutu. The construction contractor would be responsible for providing housing for construction workers and securing the required number of rooms for all workers prior to construction. The construction contractor could consider using

commercial lodging, vacant housing units, and newly constructed or repaired non-hotel housing units. Workers from outside of Tinian also could be housed on Saipan and commute to Tinian daily; however, the number of workers that would commute daily is assumed to be negligible and the majority would remain on Tinian. All travel to and from Tinian by construction workers would be on existing commercial flights or carriers, and additional flights would not be required. The ability of the Tinian hotel and housing market to provide the necessary amount of rooms for sustained periods would decrease the longer construction lasts and the longer the peak level of rooms was needed.

Public Services. Short-term, minor to moderate impacts on public services could result from increased demand placed on local health/medical, law enforcement, and firefighting services from the influx of new construction workers to Tinian. The demand on public services would increase with a 0.8 percent to 5.7 percent population increase for a limited time.

Due to the small scale of the Tinian Health Center, it could not be able to manage the increased demand adequately. To minimize the impacts on the Tinian Health Center, the construction contractor would be responsible for medical care for construction personnel during peak work periods. Similarly, the DPS would experience increased demands for law enforcement and firefighting services. While there is precedent for continuing to provide adequate police and firefighting services during periods when the island's population experiences large increases (i.e., during construction of the Tinian Dynasty Hotel and Casino), it is possible that additional security and fire personnel could be required to rectify the increased demand during the roadway improvements.

The magnitude of the impact on public services is based on the largest population increase and not necessarily the duration over which these increases would need to be sustained. Therefore, the impacts on public services would be minor to moderate during construction of the roadway improvements.

Sociocultural Issues. Short-term, minor sociocultural impacts could occur during construction of the roadway improvements. Road improvements would occur within existing roadbeds and ROWs; therefore, no land that might be homesteaded would be affected.

While construction would bring up to 25 people to Tinian during peak work periods, it is likely that a majority of these workers would be from the CNMI and Guam and respectful of local culture and customs. Therefore, it is unlikely that there would be any significant conflicts with local Tinian residents.

4.4.3.2 No Action Alternative

Under the No Action Alternative, only minor roadway repairs along the construction and fuel truck routes would occur, as was considered in the 2016 Divert EIS (Final EIS, Section 4.11.2). The No Action Alternative would require much less construction, which would result in a shorter construction period, fewer purchases of construction materials and services by the construction contractor, and fewer purchases of goods and services in the community by construction workers. Therefore, the No Action Alternative would not have an impact on existing socioeconomic conditions, but it would result in fewer beneficial impacts on the local economy than the Proposed Acton. The No Action Alternative would occur within the context of the

original Divert construction and, therefore, demand for public services and changes in sociocultural issues would not change from existing conditions.

4.4.4 Summary of Impacts

4.4.4.1 Proposed Actions and Alternatives

Increases in the Tinian population from construction workers would result in increased sales volumes in the local community, which could in turn generate indirect and induced jobs in affected industries. While existing housing/hotels on Tinian likely would be able to temporarily support the increased population, the large inflow of people could result in short-term impacts due to capacity constraints for the hotel/housing market and public services. The population increase would increase demand on public services, especially the Tinian Health Center, but medical services and other public services such as law enforcement would be augmented by the construction contractor during peak construction work periods to minimize impacts. During construction, short-term benefits on the local economy would result from the employment of construction workers and the purchase of construction-related materials and other goods and services, as well as secondary purchases of goods and services in the community.

4.4.4.2 No Action Alternatives

Under the No Action Alternatives, USAF would not construct and operate the fuel pipeline and support infrastructure, and would not construct roadway improvements; however, USAF would construct a fuel storage tank at the seaport, complete only minor road repairs, and use fuel trucks to transport fuel from the seaport to the airport. The No Action Alternatives would require less construction and fewer construction workers than the Proposed Actions resulting in fewer beneficial impacts on the local economy and no adverse impacts on housing and public services.

4.5 Environmental Justice and the Protection of Children

4.5.1 Analysis Methodology

Analysis of environmental justice and other sensitive receptors is conducted pursuant to EO 12898 and EO 13045, and guided by USAF's *Guide for Environmental Justice Analysis under the Environmental Impact Analysis Process (EIAP)*. The Proposed Actions and alternatives were assessed to determine if disproportionately high and adverse human health and environmental impacts on minority and low-income populations, or disproportionate impacts from environmental health risks or safety risks on child and elderly populations would result.

The potential for disproportionate impacts on minority and low-income populations is determined by comparing the percentage of each population in the ROI with the percentage of each population in the community of comparison (COC). Per the *Guide for Environmental Justice Analysis under the Environmental Impact Analysis Process (EIAP)*, the COC should be the smallest set of USCB data or other comparable data. Typically, if the percentage of minority or low-income population within the ROI is greater than or equal to the percentages within the COC, impacts to human populations in the ROI would constitute a disproportionate impact (USAF 2014).

For all child and elderly populations, disproportionate impacts are inherent. The extent to which child and elderly populations would be impacted is disproportionate due to their inherent vulnerabilities. Pursuant to EO 13045, due to age-related physiological differences in types and levels of exposure, the analysis of environmental impacts on children is different from the analysis of environmental impacts on adults (e.g., because children breathe more rapidly than adults and their bodies are not yet fully developed, they have different responses to environmental impacts). Therefore, the evaluation of environmental impacts on these populations is different from the evaluation of environmental impacts on adults and other populations, respectively.

To determine the disproportionately high percentage of minority or low-income population of the ROI (Tinian), the ROI is compared to the population of the community of comparison (CNMI), using the methodology described above.

4.5.2 Pipeline and Support Infrastructure

4.5.2.1 West Route

Based on analysis of 2010 U.S. Census, a slightly higher percentage of the Tinian population was minority as compared to the CNMI (98.2 percent versus [vs.] 97.9 percent) (USCB 2010e). The 2016 CNMI HIES data indicates that there is a slightly lower percentage of low-income persons in Tinian as compared to the CNMI (54.3 percent vs. 55.7 percent) (CNMI Department of Commerce 2017a) (see **Table 4.5-1**). Using the methodology identified in **Section 4.5.1**, there could be disproportionate impacts on Tinian's minority population. However, the percentage of minority persons in the populations of Tinian and CNMI differs by only 0.3 percent, and the minority populations of the CNMI and Tinian are both close to 100 percent and could be considered the same. Similarly, the difference between the percentages of the low-income population of Tinian and CNMI is close, and could be considered the same. Although the comparative analysis does not indicate a significant difference in the percentage of low income or minorities between the ROI and the COC, any potential impacts to human populations would affect communities which are considered to be low income and/or minority communities. Therefore, all potential impacts to human populations are discussed in the Environmental Justice section.

Table 4.5-1. Minority, Low Income, Child, and Elderly Populations

Demographic	Percent Minority [1]	Percent Low-Income [2]	Percent Children [2]	Percent Elderly [2]
CNMI (Community of Comparison)	97.9%	55.7%	35.5%	4.7%
Tinian (ROI)	98.2%	54.3%	39.1%	4.3%

Sources:
[1] USCB 2010e
[2] CNMI Department of Commerce 2017a

The resources that could result in disproportionate impacts on minority and low-income populations during construction and operation of the West route pipeline would be noise, air quality, socioeconomics, health and safety, and water resources. The specific potential impacts from construction include temporary increased noise and traffic levels in the immediate vicinity of work areas, decreased air quality, and increased demand on hotels/housing and public

services due to a short-term population increase. Air pollutant emissions during construction would not degrade the regional air quality. Construction noise would be temporary and periodic.

Increased demand for hotels/housing and public services could be minimized through practices discussed in **Section 4.4.2.1**. There would be few long-term impacts during operation of the pipeline. Although unlikely, the pipeline could leak resulting in impacts on health and safety and water quality if the leak affected the aquifer and near shore environments. As described in **Appendix F**, USAF would comply with all federal, CNMI, and local regulations; and industry standards and USAF policies regarding design, installation, operation and maintenance of a fuel pipeline to ensure the safe operations. Additionally, the pipeline would be actively managed by a PIM Plan, which improves integrity management of piping systems, to assist with and guide pipeline integrity maintenance and help prevent leaks or pipeline failures. Therefore, it is expected that construction and operation of the West route would not result in significant or disproportionately high and adverse health or environmental impacts on minority or low-income populations on Tinian. Although, impacts would occur because of the construction and operation of the West route, the impacts would be less than significant.

Tinian has a higher percentage of children as compared to CNMI (39.1 percent vs. 35.5 percent), but a slightly lower percentage of elderly persons (4.3 percent vs. 4.7 percent). The greatest concentration of schools on Tinian is in the village of San Jose, and includes Head Start, Tinian Elementary School, and Tinian Junior/Senior High School. The closest school to the West route is Tinian Elementary School, which is approximately 0.25 mile north. Therefore, while Tinian has a higher percentage of children, the resulting impact would be negligible to minor, short-term and intermittent, and less than significant.

The impacts on environmental justice populations due to construction and operation of the seaport support infrastructure would be identical to those described for the West route pipeline.

4.5.2.2 East Route

The impacts on environmental justice populations due to construction and operation of the East route and seaport support infrastructure would be identical to those described under the West route in **Section 4.5.2.1**.

4.5.2.3 No Action Alternative

Under the No Action Alternative, USAF would not construct and operate the fuel pipeline or support infrastructure, but would construct a fuel storage tank at the seaport and use fuel trucks to transport fuel from the seaport to the airport. Construction under the No Action Alternative would be much less than the Proposed Action and, therefore, most construction impacts that could affect environmental justice populations under the Proposed Action would be reduced. However, operation of the No Action Alternative would have long-term, periodic, negligible impacts on environmental justice populations due to the use of fuel trucks. Fuel trucks would run 10 hours per day for 30 days, during exercises, to transfer fuel to the proposed airport storage tanks. Traffic volumes along the fuel truck route would increase, thereby increasing long-term noise, traffic, and air emissions. These impacts would be less than significant.

4.5.3 Roadway Improvements

4.5.3.1 Proposed Action

The potential for disproportionate impacts on minority and low-income populations was determined by comparing the percentages of these populations on Tinian with the percentages of the comparable populations in the CNMI. As stated in **Section 4.5.2.1** and **Table 4.5-1**, the Tinian population had a higher percentage of minority persons and a lower percentage of low-income persons than the CNMI, and as such, there could be disproportionate impacts on Tinian's minority population based on the methodology identified in **Section 4.5.1**. However, the percentage of minority and low-income persons in the populations of Tinian and CNMI are very close and could be considered the same.

The resources that could result in disproportionate impacts on minority and low-income populations during construction of the roadway improvements would be noise, air quality, and socioeconomics. The specific potential impacts from construction include increased temporary noise and traffic levels in the immediate vicinity of work areas, decreased air quality, and increased demand on hotels/housing and public services due to a short-term population increase. Air pollutant emissions during construction would not degrade the regional air quality. Construction noise would be temporary and periodic. Increased demand for hotels/housing and public services could be minimized by requiring the construction contractor to secure housing prior to the start of construction and to hire additional medical, security, and firefighting personnel to supplement the existing staff during peak construction periods. Therefore, construction of the roadway improvements would not result in significant or disproportionately high and adverse health or environmental impacts on minority or low-income populations on Tinian. Although impacts would occur because of the roadway improvements, the impacts would be less than significant.

As discussed in **Section 4.5.2.1**, Tinian has a higher percentage of children as compared to CNMI, but a slightly lower percentage of elderly persons. While Tinian has a higher percentage of children, the resulting impact of construction of roadway improvements would be negligible to minor, short-term and intermittent, and less than significant.

4.5.3.2 No Action Alternative

Under the No Action Alternative, only minor roadway repairs along the construction and fuel truck routes would occur, as was considered in the 2016 Divert EIS (Final EIS, Section 4.11.2). The No Action Alternative would require minimal construction along the routes and, therefore, fewer impacts on environmental justice populations would occur.

4.5.4 Summary of Impacts

4.5.4.1 Proposed Actions and Alternatives

Disproportionately high impacts on environmental justice populations would not be expected during construction and operation of the Proposed Actions. While most of the Tinian population consists of minority persons and more than half of the population is low-income, the potential impacts from the Proposed Actions would be less than significant.

4.5.4.2 No Action Alternatives

Under the No Action Alternatives, USAF would not construct and operate the fuel pipeline and support infrastructure, and would not construct roadway improvements; however, USAF would construct a fuel storage tank at the seaport, complete only minor road repairs, and use fuel trucks to transport fuel from the seaport to the airport. The No Action Alternatives would require less construction than the Proposed Actions and would result in fewer impacts on environmental justice populations.

4.6 Health and Safety

4.6.1 Analysis Methodology

Impacts on health and safety were assessed by evaluating the relative scope and location of the proposed projects and their potential to alter or impact the existing conditions for health and safety. Impact significance was determined by analyzing the extent or degree to which implementation of the proposed projects could result in an increased risk to contractor, USAF personnel, or public health and safety. Any increase in safety risks would be considered an impact on health and safety. Impacts are assessed to determine if a proposed project would provide any of the following results:

- Substantially increase risks associated with the safety of contractors and construction personnel, USAF personnel, or the public.
- Substantially hinder the ability to respond to an emergency.
- Introduce a new health or safety risk for which the project proponent or impacted community is not prepared or does not have adequate management and response plans in place.

4.6.2 Pipeline and Support Infrastructure

Contractors and USAF personnel would implement standard compliance measures and industry standards during construction and operation of the proposed West or East route and seaport support infrastructure as described in **Appendix F**. Contractor and USAF personnel would follow Air Force Occupational Health program requirements when on property leased by the USAF. The actions and measures applicable to all projects and alternatives include the following:

- Contractors, construction personnel, and USAF personnel would adhere to all applicable federal, DOD, USAF and CNMI safety regulations as described **Section 3.6.1** and **Appendix F.**
- Contractors would be required to establish and maintain site-specific health and safety programs for their personnel.
- Contractors, construction personnel, and USAF personnel would be required to wear appropriate PPE such as ear protection, steel-toed boots, hard hats, gloves, and other appropriate safety gear.

- Equipment would be maintained and stored in accordance with the manufacturer's guidelines to prevent worker injury while operating equipment.
- Safety Data Sheets for all hazardous materials and chemicals used or stored at the worksite would be kept on site and be available for immediate review.
- Contractors, construction personnel, and USAF personnel would be properly trained on chemical, physical, and biological hazards as well as ergonomic stressors associated with construction and operations.
- If contaminated soils were discovered during construction, all activities would be stopped and appropriate remedial measures would be implemented. Additional information on the potential for contaminated soils within the project areas is included in **Section 4.11**.

USAF would require appropriate plans (e.g., evacuation plans) and safety protocols related to geological hazards to be in place prior to the commencement of construction or operations to provide for adequate protection for construction and USAF personnel. The public's exposure to geological hazards would not increase as a result of the proposed projects and, therefore, the health and safety impacts associated with geologic hazards on the public are not analyzed. Additional information on potential impacts from geologic hazards is provided in **Section 4.7**.

4.6.2.1 West Route

Contractor Health and Safety. Short-term, direct, minor impacts on contractor health and safety could occur during pipeline construction. Construction personnel could be exposed to hazards that are unique to pipeline construction. When digging trenches for the pipeline, digging too deep could potentially result in cave-ins with injury to construction personnel; however, cave-ins would be prevented through the use of trench stabilization measures. The heavy pipes used to assemble the pipeline could move or roll while being unloaded, and construction personnel engaged in moving pipes could experience lifting or crush injuries if the pipes are not handled carefully. Contractors should ensure proper staging of materials and that stockpile areas of pipes and fittings are secure, and should be prepared for high risk locations in advance, such as areas with slopes or soft ground (LHSFNA 2015). When lowering heavy pipes into excavated trenches, pipe layer machinery would be used. If a pipe layer machine becomes overloaded, the pipe could be dropped in active construction areas (About Pipelines 2015). However, contractors would keep manufacturer's load recommendations readily available to ensure that equipment is not loaded beyond its capacity when handling pipes or other heavy materials (Oil & Gas Technology 2012).

Potential impacts could also result from the risk of exposure to chemical, physical, and biological hazards; ergonomic stressors; and traffic when installing the pipeline along roadways. Construction along roadways would require additional safety measures, such as reduced speed limit enforcement, blockades and cones, and qualified flaggers to direct traffic and ensure construction personnel safety. Additionally, construction personnel should use caution in construction sites, such as when working in areas with steep slopes within the West route project area, to avoid slips, trips, and falls. Adherence to pipeline construction compliance actions and industry standards described in **Section 4.6.1**, **Appendix F**, Technical Order 37-1-1, UFC 3-460-01, and UFC 3-460-03 would minimize the potential for impacts on

contractor health and safety; therefore, no significant impacts from pipeline construction would be expected.

Long-term, direct, minor impacts on contractor health and safety could occur during pipeline operations and maintenance. In the event of a spill or leak, potential hazards to personnel would include exposure to highly flammable jet fuel, hazardous vapors that would collect in low areas, and burns or other injuries from skin contact. However, all operations and maintenance personnel would wear the necessary PPE and would be trained in emergency response procedures for spills and leaks in order to protect themselves and the public. Emergency response steps would include informing the appropriate parties to halt pipeline operation; staying clear of vapors, fumes, smoke, and spills; using appropriate air-monitoring equipment to establish the extent of vapor travel; and securing the scene without entering the hazard area. Pipeline incidents require coordination of information and resources among all responders. To ensure proper coordination, an Incident Command System (ICS) could be established. An ICS would provide common terminology, organizational structure, duties, and operational procedures to operator personnel and various federal, state, and local agencies that may be involved in response operations (PAPA 2017). Additionally, appropriate remediation procedures would be followed.

In addition to spill response actions, potential impacts on the health and safety of pipeline operations and maintenance personnel from activities such as the use of equipment and exposure to chemicals and petroleum products would be minimized by the adhering to applicable regulations and standards described in **Section 4.6.1** and **Appendix F**. Operations personnel would follow the PIM Plan and adhere to UFC 3-460-03 to ensure the pipeline is maintained properly, which would minimize the potential for spills or leaks. Therefore, no significant impacts on contractor health and safety would be expected.

USAF Personnel Health and Safety. No health and safety impacts on USAF personnel would be expected during pipeline construction because they would not be involved with this stage of the project beyond potential oversight visits. If USAF personnel are present within the construction area, they would adhere to all safety requirements and wear all necessary PPE. Potential impacts on USAF personnel health and safety from pipeline operation and maintenance would be the same as those described under ***Contractor Health and Safety*** if USAF personnel conduct operation or maintenance activities.

Airfield Safety. Short- and long-term, direct, negligible impacts on airfield safety could occur during pipeline construction and operation within the RPZ because equipment could be obstructions for pilots and personnel would be within approach zones where accidents could occur. To avoid potential impacts, construction and maintenance activities would be coordinated with Tinian International Airport personnel to prevent airfield obstructions and safety hazards. Therefore, no significant impacts on airfield safety would be expected.

Explosives Safety. Short-term, direct, negligible impacts on explosives safety could occur if construction occurs within areas with potential UXO. When working in areas where UXO could be present, USAF could provide a UXO technician to remain on site. A UXO technician would help to ensure the appropriate safety procedures are adhered to and quickly identify suspected UXO. If suspected UXO were discovered during construction, work would be halted and a UXO

technician would be notified if not already present. The UXO technician would render the material safe before it is ultimately processed for disposal in accordance with AFI 32-3001. Therefore, no significant impacts on explosives safety would be expected.

Public Health and Safety. Short-term, direct, negligible impacts on public safety could occur during pipeline construction. Signs would be posted to warn the public of hazards. Additionally, pits would be equipped with traffic-rated covers and locked for security. Emergency services would not be hindered; however, there would be slightly increased traffic on roadways when transporting construction materials and personnel, which could potentially slow emergency response times. Construction would be coordinated with CNMI DPS to ensure the ability of the emergency services personnel to respond to public emergencies. Therefore, no significant impacts on public safety would be expected during pipeline construction.

Long-term, minor impacts on public health and safety could result from pipeline operation due to the potential for spills and leaks. Potential hazards would be the same as those discussed under ***Contractor Health and Safety***. The occurrence of a spill or leak would be unlikely; however, all pipeline operations and emergency response personnel would be prepared for potential spills and leaks (Strata 2017). Emergency response steps would include securing the scene and halting pipeline operations to minimize potential impacts on public health and safety. Additionally, use of an ICS would facilitate a quick response from local emergency response personnel that would help to determine the extent of potential hazards. If necessary, members of the public within the hazard area would be evacuated immediately and an evacuation plan would be developed prior to pipeline operation. Additionally, the impacted area would be remediated as soon as possible to minimize potential long-term health impacts. Therefore, no significant impacts on public health and safety would be expected.

Impacts on contractor health and safety, USAF personnel health and safety, explosives safety, and public health and safety from seaport support infrastructure construction and operation are incorporated into those described for the West route. Potential pipeline-specific construction and operations impacts and traffic hazards described for the West route would not occur for seaport support infrastructure construction.

4.6.2.2 East Route

Impacts on contractor health and safety, USAF personnel health and safety, and airfield safety from East route pipeline construction and operations would be the same as those described for the West route in **Section 4.6.2.1**. Impacts on explosives and public health and safety from East route pipeline construction and operations would be minor and similar to, but slightly greater than, those described for the West route. The East route would be approximately 0.86-mile longer than the West route; therefore, the larger construction area could increase the potential for UXO discovery and the area that could be impacted by spills or leaks. Potential impacts would be minimized through use of compliance measures and industry standards described in **Section 4.6.1** and **Appendix F**, as well as adherence to Technical Order 37-1-1, UFC 3-460-01, and UFC 3-460-03; therefore, no significant impacts would be expected from the construction and operation of the East route pipeline.

Impacts on contractor health and safety, USAF personnel health and safety, explosives safety, and public health and safety from seaport support infrastructure construction and operation are incorporated into those described for the East route. Potential pipeline-specific construction and operations impacts and traffic hazards described for the West route would not occur for seaport support infrastructure construction.

4.6.2.3 No Action Alternative

Under the No Action Alternative, USAF would not construct and operate the fuel pipeline or support infrastructure, but would construct a fuel storage tank at the seaport and use fuel trucks to transport fuel from the seaport to the airport. The No Action Alternative would result in lesser impacts on construction personnel health and safety and explosives safety because a lesser degree of construction would be required. Greater impacts on the health and safety of operational personnel and the public would be expected from the increased potential for spills, leaks, or other hazardous risks because such issues with trucks are more common than with pipelines (Strata 2017). No significant impacts would be expected under the No Action Alternative.

4.6.3 Roadway Improvements

As described in **Section 4.6.2** contractors and USAF personnel would implement standard compliance measures and industry standards during construction of the roadway improvements.

4.6.3.1 Proposed Action

Contractor Health and Safety. Short-term, direct, minor impacts on contractor health and safety could occur during roadway improvements construction. Potential impacts would result from the risk of exposure to chemical, physical, and biological hazards; ergonomic stressors; and traffic when working along or within roadways. Construction along or within roadways would require additional safety measures, such as reduced speed limit enforcement, blockades and cones, and qualified flaggers to direct traffic and ensure construction personnel safety. Adherence to applicable regulations, compliance actions, and industry standards described in **Section 4.6.1** would minimize the potential for impacts on contractor health and safety; therefore, no significant impacts from roadway improvements construction would be expected.

USAF Personnel Health and Safety. No health and safety impacts on USAF personnel would be expected during roadway improvements construction because they would not be involved with this stage of the project beyond potential oversight visits. If USAF personnel are present within the project area, they would adhere to all safety requirements and wear all necessary PPE.

Airfield Safety. The proposed roadway improvements would not occur within an RPZ; therefore, no impacts on airfield safety would be expected.

Explosives Safety. Short-term, direct, negligible impacts on explosives safety could occur if construction occurs within areas with potential UXO. Although the roadways have been previously disturbed, UXO could be discovered within the project area. When working in areas where UXO could be present, USAF could provide a UXO technician to remain on site. If suspected UXO were discovered during construction, work would be halted and the UXO

technician would render the material safe before it is ultimately processed for disposal. Therefore, no significant impacts on explosives safety would be expected.

Public Health and Safety. Short-term, direct, negligible impacts on public safety could occur during roadway improvements construction. Traffic signs would be posted to warn the public of hazards associated with construction. There would be increased traffic on roadways when transporting construction materials and personnel and roadways would be temporarily closed, which could slow emergency response times. Construction would be coordinated with CNMI DPS to ensure the ability of the emergency services personnel to respond to public emergencies. Therefore, no significant impacts on public safety would be expected during roadway improvements construction.

4.6.3.2 No Action Alternative

Under the No Action Alternative, only minor roadway repairs along the construction and fuel truck routes would occur, as was considered in the 2016 Divert EIS (Final EIS, Section 4.11.2). Therefore, impacts on contractor health and safety, USAF personnel health and safety, explosives safety, and public health and safety would be less under the No Action Alternative due the lesser degree of required construction and subsequent roadway closures. Long-term, direct, minor impacts on public health and safety would be expected from continued use of degraded roadways. No significant impacts would be expected under the No Action Alternative.

4.6.4 Summary of Impacts

4.6.4.1 Proposed Actions and Alternatives

Impacts on contractor health and safety could occur during construction from the risk of exposure to chemical, physical, and biological hazards; ergonomic stressors; and traffic if working along or within roadways. Additional impacts on contractor health and safety would be expected from hazards that are unique to pipeline construction. Impacts on contractor health and safety could occur because of the potential for jet fuel leaks and spills, use of equipment, and exposure to chemicals and petroleum products. No health and safety impacts on USAF personnel would be expected during pipeline, seaport support infrastructure, or roadway improvements construction. Impacts on airfield safety could occur during pipeline construction and operation within the Runway Protection Zone because equipment could be obstructions for pilots and personnel would be within approach zones where accidents could occur. Impacts on explosives safety could occur if construction activities occur within areas with potential UXO. Impacts on public safety could occur during construction from increased traffic on roadways and during operation due to the potential for spills, leaks, or other hazardous risks. All impacts would be minimized through adherence to applicable standards and implementation of compliance measures in **Section 4.6.1** and **Appendix F**.

4.6.4.2 No Action Alternatives

Under the No Action Alternatives, USAF would not construct and operate the fuel pipeline and support infrastructure, and would not construct roadway improvements; however, USAF would construct a fuel storage tank at the seaport, complete only minor road repairs, and use fuel trucks to transport fuel from the seaport to the airport. In general, the No Action Alternative would have fewer impacts on health and safety due to the lesser degree of construction

required. However, greater impacts on operational personnel and public health and safety would be expected from the increased potential for spills and leaks because spills, leaks, or other hazardous risks from trucks are more common than from pipelines (Strata 2017). Additional impacts on public health and safety would be expected from continued use of degraded roadways.

4.7 Soils and Geology

4.7.1 Analysis Methodology

The methodology for identifying and evaluating impacts on geology and soils involves establishing baseline conditions through review and evaluation of maps, reports, and other relevant data showing the location and known status of geology, topographic features, soil types, and geologic hazards. This information is then correlated to elements of a proposed action and alternatives to determine potential impacts. The impact assessment for geology, topography, soils, and geologic hazards considers the following:

- Potential to destroy unique geological features
- Effects on important geologic features (including large-scale soil or rock removal)
- Potential to impact soil or geological structures that control groundwater quality or groundwater availability
- Substantial alteration of the surrounding landscape
- Diminished slope stability
- Physical disturbance that would substantially increase the rate of erosion and soil loss
- Physical disturbance that would substantially increase impervious surfaces
- Substantial alteration of soil structure or function
- Change to soil and/or bedrock conditions that would increase the vulnerability of people or property to a geologic hazard (e.g., seismic activity, tsunami, landslides, and liquefaction) and the probability that such a hazard could result in injury or property damage.

Potential impacts are evaluated based on the degree of project-induced change in a particular factor (e.g., soil erosion) relative to existing conditions, as well as by regulatory standards, where applicable. Generally, direct and indirect impacts can be avoided or minimized if proper construction techniques, erosion control measures, and structural engineering design are incorporated into project development.

4.7.2 Pipeline and Support Infrastructure

USAF would implement the construction techniques, erosion control measures, and structural engineering designs for the proposed West or East route pipeline and seaport support infrastructure, as identified in **Appendix F**, to minimize or avoid impacts on geological resources. In accordance with the Northern Mariana Islands Administrative Code Chapter 65-30, *Earthmoving and Erosion Control Regulations*, no person will commence or continue

grading, filling, or vegetation-clearing without first obtaining a permit from the CNMI BECQ. The application for this permit must include an erosion and sediment control plan (ESCP) that meets outlined requirements for conveyance and sediment control structures, slope stabilization, and erosion control. Additionally, the CNMI BECQ and GEPA developed a *Storm Water Management Manual* that addresses the development and implementation of stormwater and erosion control plans. These plans are to adequately address nonpoint source pollution through the use of currently accepted BMPs (CNMI BECQ and GEPA 2006). Additional details on the *Storm Water Management Manual* are provided in **Appendix F**. USAF also would implement the spill prevention and control measures described in **Appendix F**. These mitigation measures would minimize impacts on geological resources and soils that could occur due to an inadvertent spill during construction of the Proposed Actions or operation of the fuel infrastructure.

4.7.2.1 West Route

Regional Geology. The installation of the West route and seaport support infrastructure could result in long-term, direct, minor impacts on Mariana and Holocene limestone formations from site preparation and pipeline installation (i.e., excavation, filling, or grading). The disturbance of limestone formations could impact the permeable rock's ability to recharge aquifers. Soil compaction over the Mariana and Holocene limestone formations would be minimized by limiting construction vehicles and equipment to existing roads and through the use of measures described under **Appendix F**. The degree of disturbance and soil compaction expected would not substantially change the overall ability of the limestone formations to recharge groundwater to underlying aquifers and would not significantly alter geological structures or features; therefore, no significant impacts on regional geology would be expected. No impact on geological formations would be expected from the operation of the West route pipeline.

Physiography and Topography. Long-term, direct, negligible to minor impacts on physiography and topography would be expected as a result of site preparation and pipeline installation. These disturbances would alter the landscape, could result in slope instability, and could alter surface drainage patterns. Potential slope instability and changes to surface drainage resulting from the changes to the existing slopes would be avoided or minimized by using appropriate engineering design and controls such as those described in **Appendix F**. Additionally, natural topography and drainage would be maintained to the extent possible and the project area would be revegetated with landscape vegetation following installation of the pipeline, which would help maintain slope stability. The proposed seaport support infrastructure project area is relatively flat; therefore, disturbance of the area would not appreciably change local topography and no significant impacts would be expected. Therefore, no significant impacts on physiography and topography would be expected.

Soils. Short-term, moderate, direct impacts on soils would be expected as a result of soil disturbance and erosion during site preparation and pipeline installation. Ground disturbance could occur along the 80-foot-wide construction corridor throughout the approximately 4.08-mile-long pipeline route, which includes areas of highly erosive soil (Chinen-Rock Outcrop Complex, 15 to 30 percent slopes). Soil productivity, which is the capacity of the soil to produce vegetative biomass, would decline in temporarily disturbed areas. Loss of soil structure due to compaction from grading as well as foot and construction vehicle/equipment traffic could result

in changes in drainage patterns and increased erosion. The seaport project area has been disturbed and compacted through previous landscaping and the Shioya soils that comprise the project area have a slight erosion hazard (USDA NRCS 1989). Long-term impacts would result from permanent vegetation removal and the 4,550-square foot increase in impervious surfaces, which would result in increased rates of erosion due to increased stormwater runoff flows

Measures discussed in **Appendix F**, such as complying with CNMI erosion and sediment controls standards, would be implemented, and an ESCP would be prepared and implemented to avoid or minimize impacts from erosion and compaction. Additional erosion control measures would be implemented when disturbing areas of Chinen-Rock Outcrop Complex, 15 to 30 percent slopes. Additionally, the utility easement would be revegetated following pipeline installation, which would reduce the potential for erosion and allow for soils to regain productivity. Therefore, no significant impacts on soils within the West route project area would be expected from site preparation and pipeline installation.

Long-term, direct, minor to moderate impacts would result from pipeline operation due to the potential for spills or leaks to occur. The degree of the impact to soils would depend on the severity of the spill or leak; however, monitoring of the pipeline would prevent major spills and allow for quick clean-ups. Additionally, the occurrence of a spill would be unlikely (Strata 2017). USAF would follow the measures identified in **Appendix F**, such as Technical Order 37-1-1, for the operation of the fuel pipeline, and maintenance would occur as appropriate to minimize the potential for spills or leaks. Various practices and controls, such as the use of pipeline "pigs" that maintain and monitor pipelines from within, would also minimize the potential for spills or leaks (API 2015).

In the event of a spill or leak, jet fuel would impact the surrounding soils. While evaporation would remove some of the fuel from the terrestrial environment, bioremediation and biodegradation could lessen the impacts on soil from potential releases of jet fuel (Karthikeyan et al.1999). Additionally, use of measures described in **Appendix F** that would limit disturbance, erosion, and compaction would preserve the presence of microbial soil communities that could biodegrade jet fuels (Karthikeyan et al.1999). Additional remediation measures that would be implemented in the event of a spill or leak are discussed in **Section 4.11**.

Additional long-term impacts would be expected from continued pipeline and vegetation maintenance in the corridor that would result in soil compaction from foot and vehicle traffic as well as disturbance and erosion. These impacts would be minimized by keeping vehicles on paved roadways and implementing erosion control measures during vegetation maintenance. Therefore, no significant impacts from pipeline operation would be expected.

Geologic Hazards. Long-term, direct, minor to moderate impacts from geologic hazards could occur as a result of potential damage during pipeline and support infrastructure installation and operation.

As stated in **Section 3.7.2**, fault lines may underlie portions of the proposed West route and there is a potential for ground displacement. USAF would conduct a geotechnical investigation along the pipeline route to classify the subsurface composition and identify the presence of any

faults. Results of the geotechnical investigation would be incorporated into the final pipeline design, which would adhere to specifications in American Society of Mechanical Engineers Standard B31.3 *Process Piping* and Standard B31.4 *Transportation Systems for Liquids and Slurries*. The fuel pipeline and fuel facilities also would be constructed in accordance with seismic requirements, including those for seismic loads outlined in American Society of Civil Engineers Standard 7-10 *Minimum Design Loads for Buildings and Other Structures* and UFC 3-310-04 *Seismic Design for Building* to reduce impacts from geologic hazards associated with slope instability (i.e., landslides), seismic activity, and liquefaction. The pipeline design could include buried low friction interfaces to allow pipes to move during fault lines movement. Adherence to these requirements would minimize potential for impacts on human life and property associated with geologic hazards.

The West route partially occurs within areas that could be impacted by tsunamis and the seaport project area is entirely within an area that could be impacted; however, the pipeline would be underground and both the pipeline and support infrastructure would be engineered to withstand the loss of soil stability (i.e., erosion) that could result. Additionally, the West route's location on the western side of the island would allow for hazard mitigation in the event of a tsunami, the band of coral reef that surrounds Tinian provides protection from tsunamis, and the steep slope of the ocean floor surrounding the island lowers the risk of significant wave run up (NOAA 2013, USAF 2016a). Additionally, all facilities would be constructed in accordance with tropical requirements, including those for wind loads outlined in American Society of Civil Engineers Standard 7-10 *Minimum Design Loads for Buildings and Other Structures*, UFC 3-301-01 *Structural Engineering*, and UFC 3-440-05N *Tropical Engineering*.

A majority of the West route would be on relatively level ground; however, portions of the pipeline would be in areas with steep slopes, which could increase the potential for landslides. Measures such as erosion controls and protective barriers (as described in **Appendix F**) would be used to reduce the potential for landslides as a result of pipeline installation.

A majority of the West route would be underlain by consolidated limestone bedrock; however, portions of the pipeline would be installed on fill or other unconsolidated materials that could fail due to liquefaction. Installation and operation of the pipeline in accordance with applicable standards would minimize potential hazards associated with ground movement and liquefaction. The seaport support infrastructure project area does not contain steep slopes or fill land/other unconsolidated materials; therefore, there would be a lower chance for impacts from landslides and liquefaction. Karst topography is not known to occur within the West route or seaport project area; however, proper construction techniques would be implemented if it were discovered.

Prior to pipeline installation, USAF would evaluate subsurface conditions and determine design and installation procedures for earthquake, tsunami, landslide, and liquefaction safety. Additionally, the pipeline would be designed and operated in accordance with the standards described in **Appendix F** to minimize potential damage to the pipeline. If a geologic event were to damage the pipeline, low point drains could be used to fully drain the pipe if required and flow of the jet fuel would be shut off in order to prevent additional spills or leaks. With the use of engineering controls and adherence to all applicable installation and operation standards, the

potential for pipeline damage during an earthquake or subsequent tsunami, landslide, or liquefaction event would be reduced; therefore, no significant impacts would be expected.

4.7.2.2 East Route

Regional Geology, Physiography, and Topography. Impacts from construction at the seaport would be the same as those described in **Section 4.7.2.1**. The installation of the East route would result in impacts that are similar to, but slightly greater than, those described for regional geology, physiography, and topography in **Section 4.7.2.1** for the West route. The East route would be approximately 0.86 mile longer than the West route; therefore, it would result in increased areas of site preparation and pipeline installation. Potential impacts would be minimized through use of compliance measures and industry standards described in **Appendix F**; therefore, no significant impacts on regional geology, physiography, or topography would be expected from site preparation or pipeline installation. No impacts on regional geology, physiography, or topography would be expected from the operation of the East route.

Soils. Short- and long-term impacts on soils would be similar to, but slightly greater than, those described for the West route due to the increased area of site preparation and pipeline installation. The highly erosive Chinen-Rock Outcrop Complex, 15 to 30 percent slopes soil is also present within the East route project area. The measures in **Appendix F** would be implemented and an ESCP would help minimize impacts from erosion and compaction. Additional erosion control measures would be implemented when disturbing areas of Chinen-Rock Outcrop Complex, 15 to 30 percent slopes. Additionally, the utility easement would be revegetated following pipeline installation. Therefore, no significant impacts on soils would be expected from site preparation or pipeline installation.

Operational impacts on soils related to potential spills or leaks of jet fuel from the pipeline would be similar to those described for the West route. USAF would follow all applicable guidelines for the operation of the fuel pipeline described in **Appendix F**, conduct maintenance as appropriate, and implement various engineering controls and practices to minimize the potential for spills or leaks. Impacts associated within soil compaction, disturbance, and erosion during pipeline maintenance would be slightly greater due to the greater length of the East route. These impacts would be minimized by implementing erosion control measures during vegetation maintenance. Therefore, no significant impacts on soils would be expected from pipeline operation.

Geologic Hazards. Impacts from geologic hazards would similar to those described for the West route; however, the East route does not contain as many steep slopes as the West route and would have a slightly lower chance of landslide impacts during site preparation, pipeline installation, and operation. Prior to pipeline installation, USAF would evaluate subsurface conditions and determine design and installation procedures for earthquake, tsunami, landslide, and liquefaction safety. Additionally, the pipeline would be installed and operated in accordance with the standards described in **Appendix F** to minimize potential damage to the pipeline. Therefore, no significant impacts from geologic hazards would be expected from the installation and operation of the East route pipeline.

4.7.2.3 No Action Alternative

Under the No Action Alternative, USAF would not construct and operate the fuel pipeline or support infrastructure, but would construct a fuel storage tank at the seaport and use fuel trucks to transport fuel from the seaport to the airport. The No Action Alternative would result in lesser impacts on regional geology, physiography and topography, and soils within the West and East route project areas due to the lesser degree of ground disturbance required; however, greater impacts on soils within the seaport support infrastructure project area would be expected due to the increased impervious surface area proposed for the bulk fuel tanks in the 2016 Divert EIS (7,534 square feet) (Final EIS, Section 2.5.2). Greater impacts on soils from potential jet fuel spills would be expected because spills and leaks from trucks are more common than from pipelines (Strata 2017). Potential impacts from geologic hazards would be similar to, but lesser than, those described for the pipeline and seaport support infrastructure because the potential for damage from geologic hazards would be lower. No significant impacts would be expected under the No Action Alternative.

4.7.3 Roadway Improvements

As described in **Section 4.7.2**, USAF would obtain the appropriate permits and implement the construction techniques, erosion control measures, and structural engineering designs for the roadway improvements, as identified in **Appendix F**, to minimize or avoid impacts on geological resources. USAF would also implement the spill prevention and control measures described in **Appendix F**. These mitigation measures would minimize impacts on geological resources and soils from an inadvertent spill during construction of the Proposed Actions or operation of the fuel infrastructure.

4.7.3.1 Proposed Action

Regional Geology. Impacts on regional geology from roadway improvements would be long-term, direct, and negligible. Impacts on Mariana and Holocene limestone formations would be expected from ground disturbance and construction (i.e., excavation, grading, and paving) along approximately 2.51 miles of roadways. The disturbance of limestone formations could impact the permeable rock's ability to recharge aquifers; however, soil compaction over the Mariana and Holocene limestone formations would be minimized through use of measures described in **Appendix F**; therefore, no significant impacts would be expected.

Physiography and Topography. Long-term, direct, negligible impacts would be expected on physiography and topography as a result of roadway improvements. The proposed roadway improvements project area is relatively flat; therefore, disturbance of the area would not appreciably change local topography and no significant impacts would be expected.

Soils. Short-term, direct, minor impacts on soils would be expected as a result of soil disturbance and erosion during roadway improvements. Although removal and replacement of pavement would occur largely on already disturbed soils under the existing roadbed, soil productivity would decline in nearby temporarily disturbed areas. Loss of soil structure due to compaction from grading as well as foot and construction vehicle/equipment traffic could result in changes in drainage patterns and increased erosion. The measures discussed in **Appendix F** would be implemented and help reduce impacts, and an ESCP would be prepared and

implemented to avoid or minimize impacts from erosion and compaction during construction. Therefore, no significant impacts from construction would be expected.

Geologic Hazards. Long-term, direct, minor to moderate impacts from geologic hazards could occur as a result of potential damage during roadway improvements construction. As stated in **Section 3.7.2**, fault lines may underlie portions of the proposed roadway improvements. For those portions of the roadway that could not avoid fault lines, appropriate engineering designs would be employed to minimize potential impacts. The roadway improvements would partially occur within areas that could be impacted by tsunamis; however, the roadway would be engineered to withstand the loss of soil stability (i.e., erosion) that could result.

The roadway improvements project area does not contain steep slopes and would have a low chance of landslide impacts during construction.

A majority of the roadway improvements would be underlain by consolidated limestone bedrock; however, portions of the roadway improvements would be implemented on fill or other unconsolidated materials that could fail due to liquefaction. Construction of the roadway in accordance with applicable standards would minimize potential hazards associated with ground movement and liquefaction.

Prior to construction, USAF would evaluate subsurface conditions and determine design and installation procedures for earthquake, tsunami, landslide, and liquefaction safety. Additionally, the roadway would be constructed in accordance with the applicable standards described in **Appendix F** to minimize potential damage. Therefore, no significant impacts from geologic hazards would be expected from the construction of roadway improvements.

4.7.3.2 No Action Alternative

Under the No Action Alternative, only minor roadway repairs along the construction and fuel truck routes would occur, as was considered in the 2016 Divert EIS (Final EIS, Section 4.11.2). Impacts on regional geology, physiography and topography, soils, and susceptibility to geologic hazards would be lesser under the No Action Alternative. However, the roadway pavements would not be replaced and subject to greater continued maintenance. No significant impacts would be expected under the No Action Alternative.

4.7.4 Summary of Impacts

4.7.4.1 Proposed Actions and Alternatives

Impacts on regional geology, physiography, and typography would occur from site preparation and construction, which would disturb the underlying limestone formations, compact soils, and temporarily alter the landscape, surface drainage patterns, and potential slope instability. Impacts on soils would also occur from site preparation resulting in soil disturbance, erosion, and compaction. Long-term impacts on soils could occur from pipeline operations in the event of a spill or leak. Impacts from geological hazards on the project areas could occur due to the potential for damage from earthquakes, tsunamis, landslides, and liquefaction. All impacts would be minimized through adherence to applicable standards, the use of appropriate engineering techniques, and implementation of the measures discussed in **Appendix F**.

4.7.4.2 No Action Alternatives

Under the No Action Alternatives, USAF would not construct and operate the fuel pipeline and support infrastructure, and would not construct roadway improvements; however, USAF would construct a fuel storage tank at the seaport, complete only minor road repairs, and use fuel trucks to transport fuel from the seaport to the airport. In general, the No Action Alternatives would have a lesser impact on soils and geology. However, greater impacts on soils within the seaport support infrastructure project area would be expected due to the increased impervious surface area proposed for the bulk fuel tanks in the 2016 Divert EIS (Final EIS, Section 2.5.2). Additionally, greater impacts on soils from potential jet fuel spills would be expected because spills and leaks from trucks are more common than from pipelines (Strata 2017).

4.8 Water

4.8.1 Analysis Methodology

Factors considered in determining whether a proposed action would have a significant impact on water resources include the extent or degree to which its implementation would result in one or more of the following situations:

- Degrade groundwater, surface, or coastal water quality in a manner that would reduce the existing or potential beneficial uses of the water.
- Reduce the availability of, or accessibility to, one or more of the beneficial uses of a water resource.
- Alter the existing pattern of groundwater or surface water flow or drainage in a manner that would affect the uses of the water within or downgradient from the project area.
- Be out of compliance with existing or proposed water quality standards or with other regulatory requirements related to protecting or managing water resources.
- Substantially increase risks associated with human health or environmental hazards.
- Increase the hazard of flooding or the amount of damage that could result from flooding, including from runoff or from severe weather events.

4.8.2 Pipeline and Support Infrastructure

USAF would implement stormwater management and water quality control compliance actions and industry standards into the design, construction, and operation of the Proposed Action, as described in **Appendix F**. Implementation of these measures would reduce potential environmental impacts on water resources by reducing the potential for increased stormwater runoff, altered hydrologic conditions, altered water quality, decline in groundwater recharge, and groundwater contamination from construction or a release of petroleum products.

Measures provided in **Appendix F** would also be implemented for erosion and sediment control both during and after construction, and would minimize impacts on water resources by controlling sedimentation. Lastly, measures applicable to the safe design and operation of fuel facilities would also be implemented, as described in **Appendix F**.

4.8.2.1 West Route

Groundwater. Short- and long-term, minor to moderate impacts on groundwater resources could result from construction and operation of the 4.08-mile West route. Pollution from stormwater runoff could contribute to groundwater impacts, as well as direct impacts on groundwater resources through percolation. Impacts on groundwater resources could also result from a reduction in groundwater recharge associated with the construction and operation of seaport support infrastructure.

The reduction in vegetation and increase in impervious surface associated with the construction of seaport support infrastructure has the potential to affect overland water flow and recharge of the local aquifer. Clearing vegetation, soil compaction, and impervious surface would reduce infiltration and percolation of water to the groundwater lens by removing vegetation and natural depressions that might serve to pond stormwater and promote recharge to the aquifer. However, these impacts would be avoided or minimized through use of stormwater management measures to improve water quality and promote groundwater recharge, as identified in **Appendix F**.

Stormwater generated during construction could contain elevated sediment concentrations from trenching, and hazardous materials from spills and leaks of lubricants, fuels, or other chemicals. Due to the high permeability of the limestone on Tinian, the aquifer could be very susceptible to contamination. However, adhering to the provisions of the CGP and implementing measures in **Appendix F** associated with addressing site- and activity-specific water resource protection needs would decrease stormwater pollutant loading potential and thus reduce pollution loading potential to the underlying groundwater subbasins. The potential for stormwater runoff from the construction site would be minimized through development and implementation of a site-specific SWPPP, which describes the measures to be implemented onsite to prevent stormwater runoff.

Groundwater could also be impacted by accidental spills or leaks of fuels, lubricants, and coolant from construction equipment. By implementing proper storage, containment, and handling procedures, however, the potential hazard would be greatly minimized or avoided. USAF would develop and adhere to the provisions contained in a site-specific SPCC Plan.

Groundwater could also be impacted by accidental leaks of fuel from the pipeline. To reduce the likelihood of spills during construction and operation, all proposed fuels infrastructure would be constructed according to the applicable federal and CNMI requirements. Operation and maintenance of the pipeline would be managed by a PIM Plan, which improves the integrity management of piping systems and helps prevent leaks or pipeline failures. **Appendix F** provides additional information regarding fuel infrastructure planning, design, and management standards that would be implemented to reduce the likelihood of spills during construction and operation of the pipeline infrastructure, and the potential for those spills to reach groundwater. Based on the general direction of groundwater flow and distance/setback of the project area from the municipal well, potential leaks would not flow to the public water system well. Therefore, impacts on groundwater quality as a result of an accidental spill during construction and operation are anticipated to be minor.

Surface and Coastal Waters. Short- and long-term, direct, minor impacts on surface and coastal water resources could result from construction and operation of the 4.08-mile West route. In general, temporary impacts would result from construction such as trenching and pipeline installation and from potential leaks during operation. Impacts on surface water and coastal water resources from the seaport support infrastructure could result from degraded water quality, increased stormwater runoff, and altered hydrologic conditions.

Impacts on water quality in downgradient surface water bodies and coastal waters could occur. Construction activities such as trenching and excavating would displace soils and sediment. If not managed properly, disturbed soils and sediments could be washed into nearby surface water bodies or coastal waters during storm events and reduce water quality. To minimize the potential temporary increases in erosion and sedimentation, a CGP would be obtained and an ESCP and SWPPP would be prepared and implemented. Construction work would follow the CNMI erosion control requirements and utilize measures such as limiting ground disturbance during wet weather, minimizing compaction of soils, and use of temporary diversions and sedimentation basins that direct stormwater away from construction areas to minimize potential erosion and transportation of sediment and pollutants to coastal waters. By adhering to the provisions of the CGP and implementing erosion control measures, pollutant loading to runoff would be reduced and potential indirect impacts to nearshore waters would be subsequently lessened. The ESCP and SWPPP would identify construction-specific measures that would be implemented as part of the action to reduce the potential for erosion, runoff, sedimentation, and subsequent water quality impacts.

As previously described for groundwater, clearing and grading would remove vegetation and natural depressions that might serve to pond stormwater, thereby increasing stormwater volume and velocity. However, stormwater quantity would be managed through the use of vegetated swales and grading to maintain the pre-development hydrology and through the use of detention/retention ponds downstream of new impervious surfaces to maintain the pre-development flow rates.

Construction of the seaport support infrastructure would result in approximately 4,550 square feet of new impervious surface, which could increase the rate and volume of stormwater runoff to downgradient surface waters. Increased sediment runoff would increase surface water turbidity in receiving waters, thereby degrading water quality. However, implementation of a site-specific SWPPP with appropriate pollution-control practices would minimize these effects. Stormwater management controls would be designed and implemented consistent with permit requirements and stormwater standards to minimize potential impacts on surface water associated with the permanent increase in impervious surfaces. Low impact development strategies would be implemented as needed to comply with EISA Section 438 and would be designed in accordance with the CNMI BECQ/GEPA Storm Water Management Manual (CNMI BECQ and GEPA 2006).

Heavy equipment (e.g., bulldozers, backhoes, dump trucks) would be used on site throughout the duration of the proposed construction. Fuels, hydraulic fluids, oils, and lubricants would be stored on site to support contractor vehicles and machinery. Proper housekeeping, maintenance of equipment, and containment of fuels and other potentially hazardous materials

would be conducted to minimize the potential for a release of fluids into surface waters. Additionally, a site-specific SPCC Plan and clean-up plans would be followed to prevent spills or leaks of hazardous materials or wastes from impacting the environment.

In accordance with the project SPCC, the following setbacks from surface water resources would be maintained throughout construction and operation (unless otherwise noted):

- Construction spoil piles would be set back a minimum of 10 feet.
- No hazardous materials storage, concrete coating, or refueling would occur within 100 feet.

Wetlands. No effects on wetlands would occur as a result of West route and seaport infrastructure construction and operation. The West route and seaport infrastructure would not cross through wetlands. The closest wetland to the project area is approximately 1 mile away from the pipeline route. Implementation of properly designed and maintained erosion and sediment controls and stormwater management practices during trenching would minimize the potential for any effects on wetlands occurring in proximity to the project area.

Floodplains. No effects on floodplains would occur as a result of West route and seaport infrastructure construction and operation. Although there are areas designated as Flood Zone A in the area of the seaport construction, no impacts on floodplains would be expected. Because these flood zone areas are only designated as such due to their potential to hold water during heavy rain events and because these areas are not associated with floodplains of surface water bodies, these areas are not protected under EO 11988, Floodplain Management. During and after construction, water from heavy rain would be addressed by permit conditions of the CGP-associated SWPPP.

4.8.2.2 East Route

Groundwater. Short- and long-term, minor to moderate impacts on groundwater resources from possible contamination of the groundwater lens associated with the construction and operation of the 4.94-mile East route would be similar in type as those described for the West route. The East route is longer than the West route and would almost completely occur within an area with a shallow water table. This could increase the risk of impacts to the groundwater lens if a spill or leak were to occur.

Surface and Coastal Waters. Short- and long-term, direct, minor impacts on surface water and coastal water resources would be expected from degraded water quality associated with construction and operation of the East route and would be similar to those described for the West route. Impacts from construction of the East route would have lesser potential to affect coastal waters, as the East route travels more inland than the West route.

Wetlands. No effects on wetlands would occur as a result of East route construction and operation. The East route would not cross through wetlands. Implementation of properly designed and maintained erosion and sediment controls and stormwater management practices during trenching would minimize the potential for any effects on wetlands occurring in proximity to the project area.

Floodplains. No effects on floodplains would occur as a result of East route construction and operation for the same reasons described under the West route.

4.8.2.3 No Action Alternative

Under the No Action Alternative, USAF would not construct and operate the fuel pipeline or support infrastructure, but would construct a fuel storage tank at the seaport and use fuel trucks to transport fuel from the seaport to the airport. The use of fuel tanker trucks would increase the potential for accidental spills or leaks of fuels and have greater impacts than the Proposed Action. Under the No Action Alternative, bulk fuel storage tanks would be constructed at the seaport, resulting in a smaller area of disturbance but a larger area of impervious surfaces. Stormwater runoff volumes could be increased under this scenario. An increase in the amount of stormwater entering a surface water feature would impact the rate, volume, and duration of flow, which could degrade its quality.

4.8.3 Roadway Improvements

As described in **Section 4.8.2**, USAF would implement stormwater management and water quality control compliance actions and industry standards into the design and construction of the Proposed Actions, as described in **Appendix F**. Implementation of these measures would reduce potential environmental impacts on water resources by reducing the potential for increased stormwater runoff, altered hydrologic conditions, altered water quality, decline in groundwater recharge, and groundwater contamination from construction or a release of petroleum products.

Measures provided in **Appendix F** would also be implemented for erosion and sediment control both during and after construction, and would minimize impacts on water resources by controlling sedimentation. Lastly, measures applicable to the safe design and operation of fuel facilities would also be implemented, as described in **Appendix F**.

4.8.3.1 Proposed Action

Groundwater. Short-term, negligible impacts on groundwater could occur as a result of the road improvements. Construction of the road improvements could result in negligible direct and indirect effects from accidental spills. However, implementation of measures identified in **Appendix F** would avoid or minimize impacts on groundwater resources.

A spill or release of fuel or hazardous materials from the heavy equipment could impact groundwater quality; however, all appropriate measures would be implemented to avoid such discharges. All equipment would be maintained according to the manufacturer's specifications, and the potential for spills to occur would be minimized through the implementation of a SPCC plan. Items addressed in the SPCC include containment structure requirements, inspection of storage tanks, personnel training on spill prevention procedures, site security, loading and unloading operations, and drainage control. Therefore, construction of road improvements would have a negligible impact on groundwater resources.

Any minor grading and surface preparations for road improvements would not be anticipated to intersect the local groundwater table. Due to the surficial nature of the Proposed Action, no effects on the local aquifer would be anticipated.

Surface Waters. Short-term, minor impacts on surface water could occur as a result of road improvements. Without the implementation of proper controls, grading and other ground-disturbing activities would result in erosion and sedimentation. Proper grading techniques and implementation of standard measures and erosion and sediment controls as identified in **Appendix F** would minimize the transport of sediment to nearby surface waters. Roadside drainage would be maintained to capture runoff and prevent erosion issues.

Measures would be incorporated into the design of new construction to reduce the amount of stormwater runoff, promote ground infiltration, and reduce the potential for erosion. Stormwater would be managed in accordance with federal, state, and local requirements.

Implementing features that manage surface water runoff into the design of the project, such as appropriately designed conveyance structures (such as roadways, channels, and culverts), detention basins, or natural open space, would ensure that impacts to surface water as a result of implementation of the Proposed Action would be minimal.

Wetlands. No effects on wetlands would occur as a result of roadway improvements. The closest wetland is approximately 1.4 miles away.

Floodplains. No effects on floodplains would occur as a result of roadway improvements. Although there are areas designated as Flood Zone A in the area of the seaport construction, no impacts on floodplains would be expected. Because these flood zone areas are only designated as such because of their potential to hold water during heavy rain events, and because these areas are not associated with floodplains of surface water bodies, these areas are not protected under EO 11988, *Floodplain Management*. During and after construction, water from heavy rain would be addressed by permit conditions of the CGP-associated SWPPP.

4.8.3.2 No Action Alternative

Under the No Action Alternative, only minor roadway repairs along the construction and fuel truck routes would occur, as was considered in the 2016 Divert EIS (Final EIS, Section 4.11.2). Under the No Action Alternative, there would be an increase in the potential for accidental spills or leaks of fuels during transport on degraded roads. Any spill or leak could degrade the quality of groundwater, surface water, and downgradient coastal waters.

4.8.4 Summary of Impacts

4.8.4.1 Proposed Actions and Alternatives

Through the design, implementation, and adaptive management of an effective stormwater management system and erosion control procedures as described in **Appendix F**, construction and increases in impervious surfaces required for the Proposed Actions would result in no or an unmeasurably small increase in the amount of sediment entering water resources on Tinian. In addition, the fuel pipeline and seaport support facilities, would be designed to prevent and contain spills of hazardous materials, and plans would be developed and implemented to maintain that infrastructure and ensure rapid response in the unlikely event of a spill.

4.8.4.2 No Action Alternatives

Under the No Action Alternatives, USAF would not construct and operate the fuel pipeline and support infrastructure, and would not construct roadway improvements; however, USAF would construct a fuel storage tank at the seaport, complete only minor road repairs, and use fuel trucks to transport fuel from the seaport to the airport. The No Action Alternatives would increase the potential for accidental spills or leaks of fuels and have greater potential for runoff in comparison to the Proposed Actions.

4.9 Infrastructure and Transportation

4.9.1 Analysis Methodology

Impacts on infrastructure are evaluated based on their potential for disruption, excessive use, or improvement of the existing utilities, and solid waste management. Impacts might arise from physical changes to utility needs created by either direct or indirect changes related to the Proposed Action. Assessing impacts on utilities entails a determination of utilities that would be used or improved as a result of the Proposed Action. Effects on infrastructure were assessed to determine if the Proposed Action would result in the following impacts:

- Exceed the capacity of a utility or infrastructure.
- Result in a long-term interruption of a utility or infrastructure.
- Result in a violation of a permit condition.
- Result in a violation of an approved plan for a utility or infrastructure.

Impacts on transportation were evaluated based on traffic volume and existing LOS. Impacts are considered minor if LOS would not degrade as a result of the additional traffic or if the increase in traffic volume is less than 10 percent. Impacts are considered major if LOS would degrade as a result of the additional traffic and the increase in traffic volumes is greater than 10 percent. Additionally, impacts could remain major with a relatively small traffic volume increase if the existing LOS was already "F." Short-term impacts on the ground transportation network are considered to be those occurring during construction and immediately thereafter (approximately 1- to 4-year timeframe) and long-term impacts are considered to occur and continue starting from approximately 5 years from start of construction.

Several possible activities associated with the Proposed Actions could impact the transportation network, including construction and the movement of materials and personnel during construction. The impacts of these activities were qualitatively assessed based on information from the CNMI Comprehensive Master Plan and estimated number of trips generated by the activities associated with the Proposed Actions.

USAF would implement compliance measures and industry standards during construction and implementation of the West route, East route, and roadway improvements, regardless of alternative, to minimize or avoid infrastructure and utilities impacts. The compliance measures applicable to all alternatives are described in the following paragraphs and summarized in **Appendix F**.

During Construction

Solid Waste. Waste would be recycled per EO 13834, *Efficient Federal Operations*, and DOD requirements. Additionally, waste from vegetation clearing for construction would be composted, as practicable. USAF or their contractors would obtain all necessary permits for solid waste management and processing, including recycling and green waste processing. Required permits could include the BECQ Solid Waste Collection and Solid Waste Processing permits. Contractors hired for the various construction projects would be responsible for the removal and disposal of their construction wastes generated on site.

Water Supply. USAF would coordinate with local regulatory authorities and CUC to avoid any localized impacts on the water supply during construction.

During Operation

Energy Efficiency. New facilities would be designed to achieve Leadership in Energy and Environmental Design Silver certification; therefore, state-of-the-art energy efficiency would be expected and impacts on electrical supply would be reduced. USAF would follow DOD Energy Conservation goals; therefore, impacts on electrical supply during implementation would be reduced.

During Construction and Operation

Water Supply. Measures provided in **Appendix F** would be implemented for erosion and sediment control during and after construction, and would minimize impacts on potable water resources by controlling sedimentation. **Section 4.8** includes potential impacts on stormwater systems, and spill prevention and control are discussed in detail in **Section 4.11.**

4.9.2 Pipeline and Support Infrastructure

4.9.2.1 West Route

Airfield. Short-term, negligible impacts on the airfield would be expected from the potential disruption caused by construction associated with the West route. Disruption could be expected on airfield access roads and potentially on airfield ground operations because of the potential for foreign object debris during installation of the pipeline. Impacts would be temporary and consistent with those expected from construction of the aboveground infrastructure proposed at the airport in the 2016 Divert EIS (Final EIS, Section 4.13.2.1).

Once the pipeline is installed, fuel would be delivered to the airport through the pipeline. No impacts on airspace or airfield operations would be expected from the operation of the pipeline, and the jet fuel receiving, storage, and distribution system would remain as described the 2016 Divert EIS (Final EIS, Section 2.5.2). As with any similar system, fueling operations could result in incidental spills of fuel, but implementing appropriate spill containment and management plans would manage the potential for impacts.

Seaport. Short-term, negligible impacts on the seaport would be expected from the disruption caused by construction. Long-term impacts on jet fuel storage capacity at the seaport would occur because the fuel tanks described in the 2016 Divert EIS (Final EIS, Section 2.5.2) would

no longer be constructed. However, these impacts would be offset by installation of the pipeline, which would provide the capability to offload jet fuel from the seaport.

Electrical Supply. Short-term, negligible impacts on the existing electrical system would be expected during the extension of electrical lines to the pump house and the relocation or upgrading of any buried electrical lines. These impacts would be temporary. Additional short-term, negligible, impacts could be expected from potential power disruptions when new facilities and lighting systems are connected. It is assumed that the construction contractors would primarily use diesel- or battery-powered equipment. Any construction equipment that is powered via electricity would likely receive power from a portable generator or a temporary electrical panel.

Liquid Fuel Supply. Short-term, negligible impacts on liquid fuel supply would be expected due to the petroleum that would be required for construction equipment. The required petroleum would be brought on site by contractors and removed when construction is complete.

The seaport and airport currently do not have jet fuel receipt, storage, or distribution capabilities, so construction of the proposed fuel infrastructure would not interrupt existing liquid fuel operations. Long-term, major, beneficial impacts on the capacity to receive and distribute aviation fuel would result from the West route, which would increase fuel capacity at Tinian International Airport by operating the pipeline with an approximate rate of flow around 2,000 gpm that would enter a bulk receipt pipeline rather than fuel storage tanks.

Water Supply. Short-term, minor to moderate impacts on the water supply would be expected from the temporary shutoff, extension, connection, and use of water lines during construction, and long-term minor impacts would be expected during operation from use of the water.

Construction. During construction, the water storage system at the seaport would be connected to the existing main waterline near the corner of Pump House Road; minor to moderate impacts would be expected as this system was being connected.

Water Use from CUC System. Water to support an additional 75 construction workers would be required during construction at an average rate of 98 gpd per person, equating to approximately 7,350 gpd for all workers. It is unknown whether water for construction workers would be provided at their place of lodging or through purchase of bottled water by the construction contractor. As described in **Section 3.9**, Tinian is able to generate 252,000 gpd of potable water. Proposed water usage by construction workers would utilize only approximately 3 percent of Tinian's daily water supply available from the existing CUC water system. This analysis assumes water would be provided at the place of lodging. If water was provided through purchase of water bottles, impacts would be less than those presented.

Water Use from USAF Wells. An estimated additional 500 gallons/acre/day could be used for dust suppression during construction as identified in the 2016 Divert EIS (Final EIS, Section 4.13.2.1). Assuming an 80-foot-wide corridor over the length of the pipeline (approximately 40 acres of disturbance) and 8 acres of disturbance for supporting infrastructure, the West route would require approximately 24,000 gallons of water per day over the course of construction. Negligible amounts of water also would be needed for washing construction vehicles and

equipment and wetting base and subgrade materials to optimize moisture content for compaction, and continuously spraying aggregate stockpiles.

No other measureable water use is proposed to support construction and static testing of the pipeline would take place after construction is complete. Given the assumptions of water loss in the CUC system, proposed water usage during construction of the West route and construction infrastructure described in the 2016 Divert EIS (Final EIS, Section 4.13.2.1) would utilize 37 percent of Tinian's daily water supply available from the existing CUC water system. However, under the 2016 Divert EIS (Final EIS, Section 4.13.2.1), USAF is coordinating with BECQ to obtain a permit to install two water wells to meet USAF water requirements, each approximately 350 feet deep, to rectify impacts on the CUC potable water system. Project design would incorporate the need for water for the proposed pipeline and supporting infrastructure, and the project is scheduled for design and implementation beginning in Fiscal Year 2019. USAF would manage draw rates from the existing and proposed wells to ensure that water supply is not exceeded. The water wells would be constructed at the beginning of the construction phase and would be able to support the remainder of construction if the CUC supply could not meet the demand.

An estimated 24,000 gpd of water would be required from the proposed wells to support construction of the West route, in addition to the water required to support construction of the infrastructure in the 2016 Divert EIS (Final EIS, Section 4.13.2.1). However, fuel storage tanks would no longer be constructed at the seaport under the Proposed Action; therefore, static testing for storage tanks at the seaport, as described in the 2016 Divert EIS (Final EIS, Section 4.13.2.1), would no longer be required during construction. **Table 4.9-1** provides a summary of water needed from the USAF wells to support the Proposed Action and construction proposed in the 2016 Divert EIS (Final EIS, Section 4.13.2.1).

Table 4.9-1. Estimated Total Water Use from USAF Wells – West Route Construction

Project	Total Gallons Per Day During Construction*
West Route Construction	+ 24,000
Original Divert Construction	+ 81,016
Seaport Fuel Tank Static Testing – no longer needed	- 11,507
Maximum Total	**+ 93,509**

Note: *HDR estimation, not including construction workers who would utilize the CUC water system at their place of lodging

Therefore, minor to moderate impacts on the water supply are expected.

Operation. Once construction is complete, water storage tanks for fire suppression would be filled through a connection with the existing main waterline near the corner of Pump House Road. Approximately 225,000 gallons would be required to fill the water storage tanks at the seaport, which is approximately 90 percent of Tinian's daily water supply available from the existing CUC water system. USAF would coordinate with CUC prior to fill of the water storage tanks to manage withdraw rates and times to not deplete the water in the CUC system. If coordination with CUC deems that withdrawing water from the CUC system is not feasible for

the initial fill of the water storage tanks, USAF would utilize water from the two proposed USAF wells at the airport and transport it via truck to the seaport.

Additionally, static testing of the pipeline would be required. It is unknown whether the pipeline would be tested over multiple days or in a single day. It is assumed that the entire pipeline would be filled with potable water during a single day to conduct the testing and that testing would not occur during the same time as Divert exercises or when fire suppression tanks at the seaport or at the airport were being filled, as described in the 2016 Divert EIS (Final EIS, Section 4.13.2.2). If the pipeline were filled and tested in a single day, approximately 127,186 gpd would be required for static testing of the West route pipeline. This volume is approximately 50 percent of Tinian's daily water supply available from the existing CUC water system; if the static testing of the pipeline were conducted over multiple days, less water from the daily water supply would be required. As described under *Construction* and in the 2016 Divert EIS (Final EIS, Section 4.13.2.1), USAF would install two water wells to meet USAF water requirements and to rectify impacts on the CUC potable water. Project design would incorporate the need for water for the proposed pipeline and supporting infrastructure during construction and operation. Therefore, short- and long-term minor impacts on the water supply are expected.

Stormwater. Short-term, minor impacts on the stormwater management system would be expected from during construction and from new impervious surfaces associated with seaport infrastructure. Measures to control erosion and sedimentation described in **Section 4.8** and **Appendix F** would reduce these impacts. The discharge of stormwater runoff from construction would be authorized by CNMI and USEPA permits described in **Section 4.8** and **Appendix F**. Impacts on stormwater could also occur in the unlikely event of a fuel spill; however, measures described in **Appendix F** would be implemented to avoid or minimize these impacts. Therefore, the impacts on stormwater would not be significant.

***Sanitary Sewer and Wastewater Treatment*.** Negligible to minor impacts on sewer or wastewater treatment would be expected from an increase in the generation of wastewater during the construction of the West route, static testing of the pipeline, and facility operations at the seaport. To manage wastewater during construction and static testing, USAF could utilize the former U.S. military septic tank and leaching field south of the IBB, lease or rent the processing system from the closed Tinian Dynasty, or develop a new system. Prior to use of the U.S. military septic tank and leaching field or the Tinian Dynasty system, or development and use of a new system, USAF would obtain a wastewater treatment system permit from CNMI BECQ. If additional wastewater facilities are permitted and installed on Tinian, wastewater generated by the West route could also be disposed of through these systems in coordination with BECQ and the system owner. It is also assumed that construction workers could use portable toilets at the construction site and non-local workers would use existing wastewater infrastructure at their place of lodging.

The proposed septic system and leach field at the seaport would be permitted through BECQ and would be managed in accordance to CNMI regulations to dispose of all wastewater generated from operation of the seaport facilities.

Solid Waste. Short-term, minor impacts on solid waste management would be expected from the generation of construction debris. Construction debris is generally composed of clean

materials and therefore, to minimize impacts on the solid waste system, it would be managed as described in **Section 4.9.1**. However, debris that is not recycled would be landfilled, which would be considered a long-term, irreversible effect. The estimated amounts of debris generated from the proposed construction are approximately 1,742,400 square feet for the pipeline and approximately 20,000 square feet from the seaport infrastructure.

The debris generated from the proposed construction associated with the West route would total an estimated 881 tons over a period of 3 years prior to any recycling effort. Waste would be recycled per EO 13834 *Efficient Federal Operations* and DOD requirements. Should the Tinian landfill remain unpermitted at the time of construction, the remaining construction debris that is not recycled or managed as green waste would have to be collected and transported off the island by the construction contractor using commercial solid waste haulers and commercial barges or ships utilizing existing shipment and supply chain protocols until a permitted municipal solid waste facility is constructed.

Transportation. Short-term, minor impacts would be expected on the local transportation network in Tinian from construction of the West route. Transportation impacts during construction are limited to traffic added to the existing roadway network as a result of construction along the ROW for TR26, 6th Avenue, TR25, and TR23. This could overlap with the roadway shoulder, which could impact vehicles accessing the corridor. Approximately 75 construction workers, in addition to those analyzed in the 2016 Divert EIS (Final EIS, Section 2.5.2), could be required to support construction of the pipeline during the course of the 2- to 3-year construction period. This maximum number of workers would only be needed during shorter duration intensive or critical construction periods.

Non-local workers would most likely be housed at local lodging in or near San Jose village. Buses would be used to transport the workers to and from the construction site. If lodging for all non-resident workers were provided in San Jose and assuming 50 people per bus, approximately four round trips (two round trips in the morning and two round trips in the afternoon) would be required to transport the non-resident workers, totaling eight daily trips. It is assumed that a majority of the workers would remain on site for all breaks.

In addition to worker travel, construction would generate additional traffic resulting from miscellaneous trips occurring by inspectors, project managers, and other personnel that visit the site multiple times a day. The number of trips associated with miscellaneous trips was estimated as one round trip for every 25 workers on site. During the peak construction period when 75 workers are on site, this would equate to six trips per day. These construction trips would be dispersed throughout the day.

Table 4.9-2 summarizes the estimated daily trips expected during construction. It should be noted that this is the estimated maximum number of trips expected to occur only for several months during the peak of construction activity.

Table 4.9-2. Estimated Maximum Daily Trips – West Route Construction

Trip Source	Daily One-Way Trips*	Trip Timeframe*
Non-Local Worker Transport	8	Morning and afternoon
Miscellaneous Trips	6	All day
Total Additional Trips per Day	**14**	

Note: *HDR estimation

The daily trips generated during construction have the potential to impact the existing transportation network by increasing congestion and delay on local roadways, thereby reducing LOS, and by causing additional stress on roadway surfaces resulting in deterioration (e.g., rutting, cracking, pavement breakup) of the driving surface.

It is assumed the buses to transport non-local workers would use TR21. TR21 currently operates at LOS A with an ADT of 1,470 vehicles. Capacity of this segment is 8,000 vehicles per day (CNMI DPW 2009). If all construction-generated trips used TR21, vehicular delay would increase, but the segment LOS would not change because the delay increase would not be enough to degrade the LOS.

Roadway surfaces have a limited lifespan and deteriorate incrementally over time. The amount of deterioration is in part a function of the materials used to construct the roadway, the amount of vehicular traffic, and the mix of vehicles (trucks vs. cars). The additional vehicular traffic during construction, specifically truck traffic resulting from deliveries, would likely increase the normal deterioration of the roadways in the vicinity of the project area. Although deterioration is expected to varying degrees, it is not possible to estimate the extent of the deterioration because current pavement condition and the existing vehicle mix are unknown.

As described in the 2016 Divert EIS (Final EIS, Section 4.11.2), to help rectify potential roadway deterioration, the roadways that would be used for construction could be repaired, overlaid, and reinforced as needed to accommodate the additional traffic prior, during, or after the start of substantial construction activities. Additionally, these routes could be repaired and overlaid as needed upon completion of construction to restore the pavement condition to pre-construction levels (see **Section 4.9.3** for impacts to roadway improvements).

4.9.2.2 East Route

Impacts on the Airfield, Seaport, Electrical Supply, Liquid Fuel Supply, Stormwater, and Sanitary Sewer and Wastewater Treatment would be the same as described under the West route. Construction and operation impacts on Water Supply and Solid Waste under the East route would be similar to but greater than those described for the West route because of the additional 0.86 mile of pipeline required for this route. This would lead to an additional 8 acres of disturbance.

The same assumptions for water use under the West route would apply to the East route and the same amount of water would be required for construction workers from the CUC system. An additional 4,000 gpd of water from the USAF wells could be used over the course of construction for dust suppression because of the extended length of the pipeline, an additional 2 percent more than the West route. During operation, the East route would require 27,919 more

gallons of water from USAF wells than the West route for static testing because of the extended length of the East route pipeline; this equates to 62 percent of the assumed Tinian water availability from the existing CUC system, an additional 12 percent more than the West route. As described under Construction in **Section 4.9.2.1** and in the 2016 Divert EIS (Final EIS, Section 4.13.2.1), USAF would install and utilize two water wells to meet USAF water requirements and to rectify impacts on the CUC potable water.

An additional 344,256 square feet of debris could be generated from construction of the East route, which is an estimated additional 172 tons over a period of 3 years. There is a lack of municipal solid waste facilities on Tinian; therefore, the construction debris would have to be collected and transported off the island using commercial solid waste haulers and commercial barges or ships utilizing existing shipment and supply chain protocols until a permitted municipal solid waste facility is constructed.

Transportation impacts would be similar to those for the West route; however, the pipeline would travel an additional 0.86 mile along existing roadways. Therefore, transportation impacts along the East route would be slightly higher under this alternative. Supporting infrastructure under both alternatives would be sited in the location proposed for the bulk fuel storage facilities in the 2016 Divert EIS (Final EIS, Section 2.5.2). Therefore, impacts on supporting infrastructure would be identical to those described under the East route.

4.9.2.3 No Action Alternative

Under the No Action Alternative, USAF would not construct and operate the fuel pipeline or support infrastructure, but would construct a fuel storage tank at the seaport and use fuel trucks to transport fuel from the seaport to the airport. Fewer impacts would be expected on the water supply than under the Proposed Action; however, greater impacts on solid waste and transportation would be expected.

The additional water use (24,000 gpd for the West route or 28,000 gpd for the East route) for construction of the pipeline would not be required. However, fuel storage tanks would be constructed at the seaport and require static testing, which would use approximately 11,507 gpd of the island's available water supply over the course of 1 year.

Construction of fuel storage at the seaport under the 2016 Divert EIS (Final EIS, Section 2.5.2) would occur under the No Action Alternative, generating 1,451 tons of debris, which is greater than debris that would be generated from the West route (881 tons) or East route (1,053 tons).

Impacts on transportation would be expected from use of fuel trucks, as described in the 2016 Divert EIS (Final EIS, Section 4.13.2.2). An additional 52 to 71 trips would be made during construction, depending on the concrete pouring schedule.

4.9.3 Roadway Improvements

4.9.3.1 Proposed Action

Airfield. No impacts on the airfield would be expected from the proposed roadway improvements.

Seaport. Short-term, negligible impacts on the seaport would be expected from the disruption caused by construction associated with roadway improvements. Construction could limit ease of access on the seaport roads proposed for improvement. Long-term, minor, beneficial impacts on the port would be expected because of improved access to the seaport.

Electrical Supply. No impacts on the electrical supply would be expected from the proposed roadway improvements. It is assumed that the construction contractors would primarily use diesel- or battery-powered equipment. Any construction equipment that is powered via electricity would likely receive power from a portable generator or a temporary electrical panel.

Liquid Fuel Supply. Short-term, negligible impacts on liquid fuel supply would be expected due to the minimal amounts of petroleum that would be required for construction equipment. The required petroleum would be brought on site by contractors and removed when construction is complete. Roadway improvements would not be expected to disrupt commercial aircraft fueling operations or interrupt existing liquid fuel operations at the seaport.

Water Supply. *Water Use from CUC System.* Water to support an additional 25 construction workers also would be required during construction, at an average rate of 98 gpd per person, equating to approximately 2,450 gpd for all workers. It is assumed water for construction workers would be provided at their place of lodging or through purchase of bottled water by the construction contractor. Tinian is able to generate 1,260,000 gallons of potable water per day; however, it is estimated, as described in **Section 3.9**, that up to 80 percent of this water is lost; therefore, only approximately 252,000 gpd of potable water would be available on Tinian from the existing system. Given these assumptions of water loss, proposed water usage by construction workers would be only 1 percent of Tinian's daily water supply available from the existing CUC water system.

Water Use from USAF Wells. As with the 2016 Divert EIS (Final EIS, Section 4.13.2.1), an estimated additional 500 gallons/acre/day could be used for dust suppression during construction. Assuming a 30-foot-wide surface disturbance over 2.51 miles (approximately 9 acres of disturbance), the roadway improvements would require approximately 4,500 gallons of water per day over the course of construction. Negligible amounts of water also would be needed for additional washing construction vehicles and equipment and wetting base and subgrade to optimize moisture content for compaction, and continuously spraying aggregate stockpiles to maintain a saturated surface-dry state.

Given the assumptions of water loss in the CUC system, proposed water usage during construction of the roadway improvements and construction infrastructure described in the 2016 Divert EIS (Final EIS, Section 4.13.2.1) would utilize 34 percent of Tinian's daily water supply available from the existing CUC water system. However, under the 2016 Divert EIS (Final EIS, Section 4.13.2.1), USAF is coordinating with BECQ to obtain a permit to install two water wells to meet USAF water requirements, each approximately 350 feet deep, to rectify impacts on the CUC potable water system. Project design would incorporate the need for water for the proposed pipeline and supporting infrastructure, and the project is scheduled for design and implementation beginning in Fiscal Year 2019. USAF would manage draw rates from the existing and proposed wells to ensure that water supply is not exceeded. The water wells would

be constructed at the beginning of the construction phase and would be able to support the remainder of construction if the CUC supply could not meet the demand.

An estimated 4,550 gpd of water from USAF wells would be required to support construction of the road improvements. This amount of water would be required in addition to the water required to support construction of the infrastructure in the 2016 Divert EIS (Final EIS, Section 4.13.2.1). **Table 4.9-3** provides a summary of all water needed to support the Proposed Action and construction proposed in the 2016 Divert EIS (Final EIS, Section 4.13.2.1).

Table 4.9-3. Estimated Total Water Use from USAF Wells – Road Improvements Construction

Project	Total Gallons Per Day During Construction*
Road Improvements	+ 4,500
Original Divert Construction (includes seaport fuel tank static testing)	+ 81,016
Maximum Total	**+ 85,516**

Note: *HDR estimation

Therefore, short-term minor to moderate impacts on the water supply are expected.

Stormwater. Short-term, minor adverse impacts on the stormwater management system would be expected from roadway construction. The proposed roadway improvements would not create any new impervious surface areas; however, during construction, a temporary increase in stormwater runoff, erosion, and sedimentation would be expected. Measures to control sediment described in **Section 4.8** and **Appendix F** would reduce these impacts. The discharge of stormwater runoff from construction would be authorized by CNMI and USEPA permits described in **Section 4.8**.

***Sanitary Sewer and Wastewater Treatment*.** Negligible to minor short-term impacts on sewer or wastewater treatment would be expected from an increase in the generation of wastewater during the construction of the road improvements. To manage construction-related wastewater, construction contractors could utilize the former U.S. military septic tank and leaching field south of the IBB, lease or rent the processing system from the closed Tinian Dynasty, or develop a new system. Prior to use of the U.S. military septic tank and leaching field or the Tinian Dynasty system, or development and use of a new system, USAF would obtain a wastewater treatment system permit from CNMI BECQ. If additional wastewater facilities are permitted and installed on Tinian, wastewater generated by the West route also could be disposed of through these systems in coordination with BECQ and the system owner. It also is assumed that construction workers could use portable toilets at the construction site and non-local workers would use existing wastewater infrastructure at their place of lodging.

Solid Waste. Short-term, minor impacts on solid waste management would be expected from the generation of construction debris. Construction debris is generally composed of clean materials and therefore, to minimize impacts on the solid waste system, it would be managed as described in **Section 4.9**. However, debris that is not recycled would be landfilled, which would be considered a long-term, irreversible effect.

The debris generated from the proposed roadway improvements would total an estimated 318,072 square feet (160 tons) over a period of 1 year. Should the Tinian landfill remain unpermitted at the time of construction, the remaining construction debris that is not recycled or managed as green waste would have to be collected and transported off the island by the construction contractor using commercial solid waste haulers and commercial barges or ships utilizing existing shipment and supply chain protocols until a permitted municipal solid waste facility is constructed.

Transportation. Short-term, minor impacts would be expected on the local transportation network in Tinian during roadway construction. Impacts would be limited to roadway closure during construction and construction traffic added to the existing roadway network. Approximately 25 construction workers, in addition to those analyzed in the 2016 Divert EIS (Final EIS, Section 2.5.2), could be required to support roadway improvements. This maximum number of workers would only be needed during shorter duration intensive or critical construction periods.

Non-local workers would most likely be housed in local lodging in San Jose village. Buses would be used to transport the workers to and from the construction site during construction. If lodging for all non-resident workers were provided in San Jose village, and assuming 50 people per bus, approximately two round trips (one round trip in the morning and one round trip in the afternoon) would be required to transport the non-resident workers, totaling four daily trips. It is assumed that a majority of the workers would remain on site for all breaks.

In addition to worker travel, construction would generate additional traffic resulting from miscellaneous trips occurring by inspectors, project managers, and other personnel that visit the site multiple times a day. The number of trips associated with deliveries and miscellaneous trips was estimated as one round trip for every 25 workers on site. During the peak construction period when 25 workers are on site, this would equate to two trips per day. These construction trips would be dispersed throughout the day. Materials would be transferred from the seaport along the same route that was proposed for fuel trucks in the 2016 Divert EIS (Final EIS, Section 2.5.2). However, an additional 1,178 construction truck trips would be needed for the road improvements.

Table 4.9-4 summarizes the estimated daily trips expected during the construction of the road improvements over the course of one year. It should be noted that this is the estimated maximum number of trips expected to occur only for several months during the peak of construction activity.

Table 4.9-4. Estimated Maximum Daily Trips – Roadway Construction

Trip Source	Daily One-Way Trips*	Trip Timeframe
Non-Local Worker Transport	4	Morning and afternoon
Miscellaneous Trips	2	All day
Concrete and Cement Truck Trips	6.5	All day
Total Additional Trips per Day	**12.5**	

Note: *HDR estimation

The daily trips generated during construction have the potential to impact the existing transportation network by increasing congestion and delay on local roadways, thereby reducing LOS, and by causing additional stress on roadway surfaces resulting in deterioration (e.g., rutting, cracking, pavement breakup) of the driving surface.

The proposed bus route to transport non-local workers would use TR21, which currently operates at LOS A with an ADT of 1,470 vehicles. Capacity of this segment is 8,000 vehicles per day (CNMI DPW 2009). If all construction-generated trips used TR21, vehicular delay would increase, but the segment LOS would not change because the delay increase would not be enough to degrade the LOS.

During construction, road improvements could require full or partial closure of TR24, resulting in the need for traffic detours and rerouting that could potentially cause delays and congestion. However, once complete, road improvements would have a long-term, minor to moderate, beneficial impact on the transportation network by providing a new surface and restore pavements that would become deteriorated from Divert vehicles.

4.9.3.2 No Action Alternative

Under the No Action Alternative, only minor roadway repairs along the construction and fuel truck routes would occur, as was considered in the 2016 Divert EIS (Final EIS, Section 4.11.2). Under the No Action Alternative, roadway improvements would not be implemented and roadways would continue to deteriorate over time. The airfield, seaport, electrical supply, liquid fuel supply, and stormwater would remain as described in **Section 3.9.2**. Water demand (4,500 gallons) and the generation of solid waste (160 tons) would no longer be required for roadway improvements.

4.9.4 Summary of Impacts

4.9.4.1 Proposed Actions and Alternatives

Short-term, negligible to minor impacts on infrastructure and transportation would be expected under the Proposed Actions during construction and in the unlikely event of a fuel spill. However, long-term, beneficial impacts would be expected from the installation of the jet fuel pipeline and distribution, and improvements to the local roadways.

Table 4.9-5 shows all water requirements from USAF wells under the Proposed Actions and includes water requirements from the 2016 Divert EIS (Final EIS, Sections 4.13.2.1 and 4.13.2.2). It is unknown whether static testing of the pipelines would occur in a single day or over multiple days; however, this analysis assumes that static testing would occur in a single day. Static testing of the East route pipeline during a single day would require 155,105 gpd and would be the greatest amount of water required in a single day during construction or operation. The amount of water required for static testing of the East route would exceed the maximum amount of water potentially required for construction, which would be if the East route, road improvements, and original Divert infrastructure were all constructed concurrently. Less water would be required if static testing were conducted over multiple days and segments of the pipeline.

Table 4.9-5. Estimated Water Use from USAF Wells under the Proposed Actions

Project	Total Gallons per Day*
West Route Construction+	24,000
East Route Construction+	28,000
West Route Operation^	127,186
East Route Operation^	155,105
Roadway Improvements	4,500
Original Divert Construction (includes seaport storage tank static testing)	81,016
Original Divert Construction (without seaport storage tank static testing)	69,509

Source: DoN 2015a

Note: +includes supporting infrastructure, ^static testing on a single day, *HDR estimation.

Table 4.9-6 shows all water requirements from the Tinian CUC water system under the Proposed Actions. Water requirements for West route and East route operations are not provided because draw from the CUC system to fill the seaport water storage tanks would not occur in a single day and would be managed to minimize and prevent impacts on the water supply; or would be fulfilled by the USAF wells at the airport. If construction of the pipeline and roadway improvements occurred concurrently, a total of 9,800 gpd of water could be required from the existing CUC system for construction workers, if water for construction workers was being provided at their place of lodging. This represents approximately 4 percent of the water available from the CUC system. Less water would be required if construction workers utilized bottled water.

Table 4.9-6. Estimated Water Use from CUC System under the Proposed Actions

Project	Total Gallons per Day*
West Route Construction Workers+	7,350
East Route Construction Workers+	7,350
West Route Operation^	N/A
East Route Operation^	N/A
Roadway Improvements Construction Workers	2,450

Note: +includes supporting infrastructure, ^fill of seaport water storage tanks *HDR estimation.

Table 4.9-7 shows the estimated debris generated under both Proposed Actions. A comparison of the estimated daily trips for construction the Proposed Actions is provided in **Table 4.9-8**.

Table 4.9-7. Estimated Debris under the Proposed Actions

Project	Total Square Footage	Multiplier (pounds/ft²)*	Debris Generated (pounds)	Debris Generated (tons)
West Route	1,742,400	1	1,742,400	871
East Route	2,086,656	1	2,086,656	1,043
Supporting Infrastructure	4,550	4.34	19,757	10
Roadway Improvements	318,072	1	318,072	160
Maximum Total	**2,409,278**	**N/A**	**2,424,485**	**1,213**

Source: USEPA 2009
*Based on the weighted average of materials per square foot.

Table 4.9-8. Estimated Maximum Daily Trips – Construction

Trip Source	Total Additional Trips per Day*	Trip Timeframe
West Route	14	Morning and afternoon
East Route	14	All day
Roadway Improvements	12.5	All day
Maximum Additional Trips per Day	**26.5**	

Note: *HDR estimation

4.9.4.2 No Action Alternatives

Under the No Action Alternatives, USAF would not construct and operate the fuel pipeline and support infrastructure, and would not construct roadway improvements; however, USAF would construct a fuel storage tank at the seaport, complete only minor road repairs, and use fuel trucks to transport fuel from the seaport to the airport. Under the No Action Alternatives, less water would be required for static testing of the fuel tanks and would not be required for road improvements. Additionally, less construction debris would be generated. However, impacts on transportation would be expected from use of fuel trucks, as described in the 2016 Divert EIS (Final EIS, Section 4.11.2), and deterioration of roadways would likely increase. The airfield, seaport, electrical supply, liquid fuel supply, and stormwater would remain as described in **Section 3.9.2**.

4.10 Land Use and Recreation

4.10.1 Analysis Methodology

Land Use and Ownership. A comparative methodology is used to determine potential impacts on land use. The Proposed Actions are examined and compared to existing land use conditions. Impacts are evaluated as they relate to the following:

- Compatibility of the proposed activities with existing land ownership and land uses at the proposed project areas and in the surrounding areas
- Availability of sufficient land within the appropriate land use designation for the proposed activities.

Land use compatibility is defined here as the ability of two or more land uses to coexist without conflict. Examples of conflicts include interference of proposed activities with existing activities, and activities resulting in human health and safety issues due to poor siting. Frequently, compatibility between land uses exists in varying degrees based on the frequency, duration, and intensity of a proposed activity. Land uses or land use designations may preclude proposed activities from being located within a designated area that would be incompatible with the current or proposed uses. However, an activity could be co-located within a land use designation that it is not normally associated with based on evaluation of its compatibility with nearby activities, including consideration of the availability of facilities and infrastructure, safety issues, and sensitive environments. Potential impacts on land use compatibility are based on qualitative assessments. Land disturbance within a given land use designation is not considered a land use impact under these criteria unless the disturbance results from a proposed activity that is incompatible with the land use designation.

Coastal Zone and Submerged Lands. Impacts on coastal uses or resources within the Tinian coastal zone, including APCs, were evaluated by examining the consistency of the Proposed Actions with the coastal resources and uses. USAF submitted a consistency determination to CNMI DCRM that the Proposed Actions would be consistent to the maximum extent practicable with the enforceable policies of the CNMI coastal zone management program. On August 8, 2019, CNMI DCRM provided conditional concurrence with the USAF determination.

***Recreation*.** The environmental impacts on recreational resources near the Proposed Actions are assessed based on recreational availability and use. Each Proposed Action is assessed to determine if it would substantially impede access to recreational resources, reduce recreational opportunities, cause conflicts between recreational users, or result in the physical deterioration of recreational resources.

4.10.2 Pipeline and Support Infrastructure

4.10.2.1 West Route

Land Use and Ownership. Portions of the proposed pipeline would be constructed at Tinian International Airport and the Tinian seaport on public land acquired or leased by USAF and proposed for construction in the 2016 Divert EIS. The pipeline would also be constructed on public land within easement rights held by the U.S. federal government that allow it to install, operate, and maintain fuel infrastructure and other utilities. Appropriate routing for use of these easement rights would be coordinated with the CNMI, platted, and recorded. Coordination with local and federal agencies, engineering or design limiting factors, and other factors could require modification of the route. Construction of the West route pipeline could result in short-term, minor impacts on public land ownership. If the utility easement location required acquisition in real property interest of private land with an existing use that conflicted with construction, then the impact on land ownership would be long-term and moderate.

Construction of the pipeline at the Tinian seaport and Tinian International Airport would occur on public lands currently operated by the CPA, and designated as public facility, public facility undeveloped, and undeveloped public land by the CNMI DPL. Other portions of the West route pipeline between the seaport and airport are within public lands designated as public facility

undeveloped and undeveloped public land. Construction and operation of the pipeline in these areas would be consistent with the public land use designations.

A majority of the West route is surrounded by undeveloped public land, except at and near the Tinian seaport and Tinian International Airport. The West route would pass approximately 0.25 mile of residential lots on private land on TR26 and the Tinian Municipal Dump on public land on TR25. Although not incompatible with these uses, construction of the pipeline near the residences could create temporary disturbances such as increased noise and traffic. Pipeline construction would not disrupt operations at the Tinian seaport or Tinian International Airport. Therefore, construction of the West route pipeline would be compatible with the public and private land uses, but would result in short-term, minor to moderate impacts on land use due to temporary disturbances.

Operation of the West route pipeline would occupy 6 feet of unencumbered space within a 20-foot utility easement. The U.S. federal government retains easement rights to install, operate, and maintain fuel infrastructure and other utilities within approximately 1,356 acres of land at Tinian International Airport (West Tinian Airport and Expansion Land), and 1,245 acres south of the airport (Surplus Area) according to the 1994 Leaseback and Disposal Agreement and the 1999 Partial Release of Leasehold Interest (CNMI 1994, CNMI 1999). The West route pipeline would be fully within these areas and, therefore, USAF has the right to operate and maintain the proposed pipeline and retain a 20-foot maintenance easement in the area. The presence of the pipeline would preclude the future siting of other public land uses in the 20-foot easement. This would be a long-term, minor impact, as a majority of the West route is undeveloped public land that is available for public land uses, including a pipeline. Operation of the West route pipeline would not preclude the future development of any homestead subdivisions, including the West San Jose Homestead site that is on TR24 (6th Avenue), east of the West route. Therefore, operation of the West route pipeline could result in long-term, minor to moderate impacts on land use.

Impacts on land use and ownership from construction and operation of the seaport support infrastructure would be the same as those described for the southern portion of the West route. Therefore, short- and long-term, minor impacts on land use and land ownership would be expected from construction or operation of the seaport support infrastructure.

Coastal Zone and Submerged Lands. Construction and operation of the West route pipeline and support infrastructure at the Tinian seaport would occur within the Port and Industrial APC and Shoreline APC. Therefore, the proposed infrastructure could affect coastal uses and resources that are subject to CZMA federal consistency requirements. USAF completed a consistency determination for both Proposed Actions, including the West route pipeline, and submitted it to the DCRM with the Draft SEIS. The West route would be consistent to the maximum extent practicable with the enforceable policies of the CNMI CRM Program as per the *Procedures Guide for Achieving Federal Consistency with the CNMI Coastal Management Program* (CNMI DCRM 2015b). On August 8, 2019, CNMI DCRM provided conditional concurrence with the USAF determination, on the condition that USAF obtain a major siting permit. Therefore, USAF would obtain a major siting permit for construction of the West route pipeline and seaport support infrastructure. The portion of the West route pipeline outside of the

Tinian seaport would not occur within any designated APCs or affect coastal resources. USAF and CNMI DCRM correspondence regarding CZMA compliance is provided in **Appendix H**.

Recreation. Short-term, minor to moderate impacts would be expected on recreational resources on Tinian during construction of the pipeline along the West route. The majority of the recreational resources on Tinian are associated with coastal areas island-wide, the Ushi Field-North Field Trail, and near San Jose Village. The southern end of the West route and support infrastructure project area is within approximately 0.25 mile of Kammer Beach, House of Taga, and the marina/boat ramp at the seaport. Few recreational resources are found along the central and northern portions of the West route and in the immediate vicinity of Tinian International Airport. Construction would expose some recreational resources in the San Jose area to construction noise, could increase the number of vehicles on roads, and could result in increased use of resources by construction workers. Therefore, construction could disturb recreational users, increase congestion and travel times to recreational areas, and increase congestion at recreational areas. However, all roadways would remain open and no recreation areas would be closed. Tourists, visitors, and residents would still have access to all recreational opportunities. The total West route construction period would be 2 to 3 years, but would not be in any one location for the whole 2- to 3-year period. Therefore, impacts on recreation from construction noise and additional congestion would be short-term and minor.

No impacts on recreation are expected during operation of the West route pipeline.

4.10.2.2 East Route

Land Use and Ownership. Impacts on land use and ownership due to construction and operation of the pipeline along the East route would be similar to those described under the West route in **Section 4.10.2.1**. The northern and southern portions of the East route would be identical to the West route, but the central portion of the East route takes a more easterly route as compared to the West route. The East route pipeline would not pass the Tinian Municipal Dump, but would traverse an undeveloped area of public land south of Tinian International Airport that is designated as undeveloped public land. Construction and operation of the East route would be consistent with the public and private land uses and compatible with existing land ownership. Therefore, construction and operation of the East route pipeline would result in short- and long-term, minor impacts on land use and ownership. However, if the East route must be relocated to private land, there could be short- and long-term, minor to moderate impacts on land use and ownership.

Coastal Zone and Submerged Lands. Construction and operation of the East and West pipeline routes at the Tinian seaport would be identical. Therefore, the East route pipeline within the seaport would also occur within the Port and Industrial APC and Shoreline APC, and could affect coastal uses and resources that are subject to CZMA federal consistency requirements. USAF completed a consistency determination for both Proposed Actions, including the East route pipeline, and submitted it to the DCRM with the Draft SEIS. The East route pipeline would be consistent to the maximum extent practicable with the enforceable policies of the CNMI CRM Program as per the *Procedures Guide for Achieving Federal Consistency with the CNMI Coastal Management Program* (CNMI DCRM 2015b). On August 8, 2019, CNMI DCRM provided conditional concurrence with the USAF determination, on the

condition that USAF obtain a major siting permit. Therefore, USAF would obtain a major siting permit for construction of the East route pipeline and seaport support infrastructure. The portion of the East route pipeline outside of the Tinian seaport would not occur within any designated APCs. USAF and CNMI DCRM correspondence regarding CZMA compliance is provided in **Appendix H**.

Recreation. Recreational impacts due to construction of the pipeline along the East route would be similar to those described under the West route, but to a slightly greater extent because the East route is 0.86 mile longer and construction would be expected to last longer than the West route. Construction would increase congestion on roadways and would expose some recreation resources in the San Jose area to noise, which could inconvenience travelers using the roadways and disturb some recreational users for a longer period of time. Therefore, short-term, minor impacts on recreational resources would be expected.

No impacts on recreation are expected during operation of the East route pipeline.

4.10.2.3 No Action Alternative

Under the No Action Alternative, USAF would not construct and operate the fuel pipeline or support infrastructure, but would construct a fuel storage tank at the seaport and use fuel trucks to transport fuel from the seaport to the airport. Construction of the No Action Alternative would have similar impacts on land use and ownership, APCs, and recreation as described under the West route in **Section 4.10.2.1**. However, operation of the No Action Alternative would have long-term, periodic, negligible impacts on recreation due to the use of fuel trucks. Fuel trucks would run 10 hours per day for 30 days, during exercises, to transfer fuel to the proposed airport storage tanks. Traffic volumes along the fuel truck route would increase, and travel to the recreational resources in the northern portion of the island could become temporarily inconvenienced. However, tourists, visitors, and residents would not be denied access to recreational uses.

4.10.3 Roadway Improvements

4.10.3.1 Proposed Action

Land Use and Ownership. Construction of the roadway improvements would occur on public land (i.e., existing roadways), and would occur within the existing roadbeds and shoulders. No roadbed widening or ROW alterations would occur. Roadways do not have an official CNMI DPL land use designation, but are on public land and are considered public facilities. A majority of the roadway improvement route is surrounded by undeveloped public land, except at the Tinian seaport and approximately 0.5 mile that passes residential lots on private land within San Jose. Although the proposed roadway work is not incompatible with residential uses, construction near the residences could create temporary disturbances such as increased noise and traffic. Construction is expected to remain within the existing roadbed and shoulder. However, construction could require a disturbance area of up to 30 feet wide, which would extend outside of the roadbed and shoulder. Any disturbances from construction would be temporary and, if necessary, areas that were disturbed would be vegetated or otherwise returned to their original state. Construction of the roadway improvements would be consistent with public and private land uses and land ownership, and compatible with surrounding land

uses. Therefore, proposed construction of roadway improvements would result in short-term, negligible impacts on land use due to temporary construction disturbances.

Coastal Zone and Submerged Lands. Construction of the roadway improvements at the Tinian seaport would occur within the Port and Industrial APC and Shoreline APC. Therefore, the proposed roadway improvements at the seaport could affect coastal uses and resources that are subject to CZMA federal consistency requirements. USAF completed a consistency determination for both Proposed Actions, including the roadway improvements, and submitted it to the DCRM with the Draft SEIS. The roadway improvements would be consistent to the maximum extent practicable with the enforceable policies of the CNMI CRM Program as per the *Procedures Guide for Achieving Federal Consistency with the CNMI Coastal Management Program* (CNMI DCRM 2015b). On August 8, 2019, CNMI DCRM provided a conditional concurrence with the USAF determination, with the condition that the USAF obtain a major siting permit. Therefore, USAF would obtain a major siting permit for construction of the roadway improvements. The portion of the roadway improvements that are outside of the Tinian seaport would not occur within any designated APCs or affect coastal resources. USAF and CNMI DCRM correspondence regarding CZMA compliance is provided in **Appendix H**.

Recreation. Short-term, minor to moderate impacts would be expected on recreational resources on Tinian during construction of the roadway improvements. The majority of the recreational resources on Tinian are associated with coastal areas island-wide, the Ushi Field North Field Trail, and near San Jose Village. The southern end of the roadway improvements is within 0.25 mile of Kammer Beach, House of Taga, and the marina/boat ramp at the seaport. Few recreational resources are found along the central and northern portions of the roadway improvement route. Construction would expose some recreation resources in the San Jose area to construction noise, could increase the number of vehicles on roads, and could result in increased use of resources by construction workers. Therefore, roadway improvements could disturb recreational users, increase congestion and travel times to recreational areas, and increase congestion at recreational areas. However, all roadways would remain open and no recreation areas would be closed. Tourists, visitors, and residents would still have access to all recreational opportunities. The roadway improvement construction period would be 1 year, but actual work would progress along the route and not be in any one location for the whole 1-year period. Therefore, impacts on recreation from construction noise and traffic congestion would be short term and minor.

4.10.3.2 No Action Alternative

Under the No Action Alternative, only minor roadway repairs along the construction and fuel truck routes would occur, as was considered in the 2016 Divert EIS (Final EIS, Section 4.11.2). The No Action Alternative would require minimal construction along the routes and, therefore, fewer short-term impacts on land use and recreation. However, because the roadways would continue to deteriorate, repairs would be made periodically as needed to repair substandard roadways. Therefore, the No Action Alternative would have short- and long-term, periodic, negligible impacts on land use and recreation.

4.10.4 Summary of Impacts

4.10.4.1 Proposed Actions and Alternatives

The Proposed Actions would occur on public land on which the U.S. federal government retains easement rights that allow it to install, operate, and maintain fuel infrastructure and other utilities. Construction and operation of the Proposed Actions would be consistent with the public land ownership and compatible with designated land uses within the project areas and surrounding areas. Portions of each Proposed Action would occur adjacent to private land with residential uses, and could create temporary disturbances such as increased noise and traffic. These disturbances would result in short-term, minor impacts on land use and recreation. The presence of the pipeline would preclude the future siting of other land uses in a 20-foot utility easement. Therefore, operation of the pipeline would result in long-term, minor to moderate impacts on land use and ownership.

4.10.4.2 No Action Alternatives

Under the No Action Alternatives, USAF would not construct and operate the fuel pipeline and support infrastructure, and would not construct roadway improvements; however, USAF would construct a fuel storage tank at the seaport, complete only minor road repairs, and use fuel trucks to transport fuel from the seaport to the airport. The No Action Alternatives would require less construction than the Proposed Actions, and would result in fewer short-term impacts on land use and recreation, but more long-term impacts from the use of fuel trucks and from potential road deterioration.

4.11 Hazardous Materials and Wastes

4.11.1 Analysis Methodology

Impacts on or from hazardous materials and wastes would be considered significant if a proposed action would result in noncompliance with applicable federal or CNMI regulations, or increase the amounts generated or procured beyond current management procedures, permits, and capacities. Impacts on contaminated sites would be considered significant if a proposed action would disturb or create contaminated sites resulting in negative impacts on human health or the environment, or if a proposed action would make it substantially more difficult or costly to remediate existing contaminated sites.

4.11.2 Pipeline and Support Infrastructure

4.11.2.1 West Route

Short-term, minor impacts would occur from the use of hazardous materials and petroleum products and the generation of hazardous wastes during the construction and operation of the proposed West route pipeline. Hazardous materials that could be used in pipeline construction include welding gases, solvents, preservatives, and sealants, and could be generated from removal of material from low point drains during pipeline operations. Hydraulic fluids and petroleum products, such as diesel and gasoline, would be used in the vehicles and equipment supporting construction. Construction and operation would generate negligible to minor quantities of hazardous wastes. Contractors would be responsible for the disposal of hazardous wastes in accordance with federal and CNMI laws, including use of satellite accumulation points

in accordance with the RCRA. All hazardous materials, petroleum products, and hazardous wastes would be contained, stored, and managed appropriately (e.g., secondary containment, inspections, spill kits) in accordance with applicable regulations to minimize the potential for releases. Contractors could be required to develop and implement their own Spill Prevention Control and Countermeasure Plans. All construction equipment would be maintained according to the manufacturer's specifications and drip mats would be placed under parked equipment as needed.

No hazardous materials, hazardous wastes, or petroleum products are stored within the West route. Therefore, no hazardous materials, hazardous wastes, or petroleum products would need to be removed prior to construction. While no existing contamination areas are known to occur along the proposed West Route, the route passes adjacent to several facilities or locations that are known to use, store, or dispose of hazardous materials, hazardous wastes, and petroleum products or with the potential to have environmental contamination. The pipeline would be routed down the center of the dump access road until the pipeline is clear of the dump for at least 500 feet on either side. The pipeline would also be clearly marked in these areas to ensure that the pipeline is not damaged by earth moving equipment that may be operated at the trash dump.

Additionally, the possibility exists for the discovery of UXO during construction, especially in areas that have not been developed since World War II. If soil or groundwater that is believed to be contaminated or UXO were discovered, the contractor would be required to immediately stop work, report the discovery to USAF, and implement appropriate safety measures. Commencement of field activities would not continue in this area until the issue was investigated and resolved. The remediation of any existing contamination or UXO would be a long-term, minor, beneficial effect. The proposed pipeline would not interfere with the operation of any existing fuel storage or delivery infrastructure, most notably the existing ASTs at the Port of Tinian, Tinian International Airport, and Commonwealth Utility Corporation power plant as well as the fuel pipeline between the Port of Tinian and the Commonwealth Utility Corporation power plant. The West route would cross the power plant's fuel pipeline and parallel that pipeline along TR26; however, it would not disrupt its operation.

Long-term, negligible impacts would occur from operation of the proposed fuel pipeline under the West route resulting from the potential for a release. The proposed pipeline would be capable of transporting approximately 2,000 gallons of jet fuel per minute and would transport all jet fuel necessary to sustain divert activities occurring on Tinian; therefore, a breach or failure of the pipeline could result in a sizable release. However, a release is unlikely. As stated in **Section 2.2** and **Appendix F**, the proposed fuel pipeline would be designed and constructed in accordance with all appropriate federal, CNMI, DOD, and USAF regulations for petroleum fuel pipelines and facilities, including UFC 3-460-01. The pipeline would be constructed underground, to the extent practicable, to prevent breaches, vandalism, sabotage, or any other means to disrupt the flow of fuel. USAF would follow Technical Order 37-1-1, UFC 3-460-03, and AFI 23-201 for the operation of the fuel pipeline. Maintenance on the proposed pipeline would be conducted as needed, and the pipeline would be managed by a PIM Plan to assist with and guide pipeline integrity maintenance. PIM Plans improve the integrity management of piping systems and help prevent leaks or pipeline failures. The plans are developed based on

the principles of *API Standard 570 Inspection, Repair, Alteration, and Rerating of In-Service Piping Systems* and federal and local regulations.

The 2016 Divert EIS (Final EIS, Section 2.5.2) analyzed the operation of 9.24 million gallons of jet fuel storage capacity at Tinian International Airport. These ASTs would be filled using the proposed pipeline rather than delivery trucks as analyzed in the 2016 Divert EIS (Final EIS, Section 2.5.2). Fuel delivery trucks have a greater potential for a release as compared to a fuel pipeline because vehicular accidents, equipment malfunctions, and operator error are occasional occurrences and contributors of a release (Hansen and Dursteler undated, Strata 2017). Therefore, the elimination of delivery trucks and the use of the proposed fuel pipeline would have long-term, negligible, beneficial impacts on hazardous materials and wastes from a slightly lesser potential for a release.

Impacts on hazardous materials and wastes from construction and operation of the proposed seaport support infrastructure would be the same as those described for the fuel pipeline. The proposed seaport support infrastructure would not interfere with the operation of any existing fuel storage or delivery infrastructure on Tinian. The proposed seaport support infrastructure would be designed and constructed in accordance with the same federal, CNMI, DOD, and USAF regulations for petroleum fuel pipelines and facilities. The proposed fuel pipeline would eliminate the need for the two 50,000-bbl fuel storage tanks at the seaport described in the 2016 Divert EIS (Final EIS, Section 2.5.2).

4.11.2.2 East Route

Impacts on hazardous materials and wastes from pipeline construction and operation under the East route would be the same as those described for the West route in **Section 4.11.2.1.** However, these impacts would occur at some different locations on Tinian and the pipeline would not need to be routed in consideration of the Tinian dump. Short-term, minor impacts would occur from the use of hazardous materials and petroleum products and the generation of hazardous wastes during the construction and operation of the proposed East route pipeline. No hazardous materials, hazardous wastes, or petroleum products are stored within the East route; therefore, none would need to be removed prior to construction. While no existing contamination areas are known to occur along the proposed East route, the route passes adjacent to several facilities that are known to use, store, or dispose of hazardous materials, hazardous wastes, and petroleum products or with the potential to have environmental contamination. Additionally, the possibility exists for the discovery of UXO during construction, especially in areas that have not been developed since World War II. Similar actions as described for the West route would be implemented in the event of the discovery of environmental contamination or UXO during construction of the East route. The proposed pipeline would not interfere with the operation of any existing fuel storage or delivery infrastructure on Tinian. The East route would cross the power plant's fuel pipeline and parallel that pipeline along TR26; however, it would not disrupt its operation.

Identical long-term, negligible impacts would occur from operation of the proposed fuel pipeline under the East route as are described in **Section 4.11.2.1** for operation under the West route. The proposed pipeline would be designed and constructed in accordance with the same federal, CNMI, DOD, and USAF regulations for petroleum fuel pipelines and facilities, and the pipeline

would be managed by a PIM Plan. Similar long-term, negligible, beneficial impacts would occur from a slightly lesser potential for a release using the proposed pipeline as compared to the fuel delivery trucks analyzed in the 2016 Divert EIS (Final EIS, Section 4.12.2.2).

4.11.2.3 No Action Alternative

Under the No Action Alternative, USAF would not construct and operate the fuel pipeline or support infrastructure, but would construct a fuel storage tank at the seaport and use fuel trucks to transport fuel from the seaport to the airport. Long-term, negligible to minor impacts on hazardous materials and wastes would occur under the No Action Alternative. Fuel delivery trucks have a slightly greater potential for a release when compared to a fuel pipeline (Hansen and Dursteler undated, Strata 2017). Additionally, two 50,000-bbl fuel storage tanks would be constructed at the seaport rather than the pump house and boom storage infrastructure. This added fuel storage capability would slightly increase the potential for a release at the seaport. The proposed fuel storage tanks would be designed and constructed in accordance with the same federal, CNMI, DOD, and USAF regulations for petroleum fuel pipelines and facilities. The 2016 Divert EIS (Final EIS, Section 4.12.2) provides further detail on hazardous materials and wastes impacts from the use of fuel delivery trucks and the 50,000-bbl fuel storage tanks.

4.11.3 Roadway Improvements

4.11.3.1 Proposed Action

Impacts on hazardous materials and wastes from construction associated with the proposed roadway improvements would be short term and minor. Hazardous materials that could be used in roadway construction are mainly hydraulic fluids and petroleum products, such as diesel and gasoline, used in the vehicles and equipment supporting construction. Additionally, the roadways themselves would be made of asphalt, and asphalt is a by-product of the petroleum refining process. Contractors would be responsible for the disposal of hazardous wastes in accordance with federal and CNMI laws. All hazardous materials, petroleum products, and hazardous wastes used or generated during construction would be contained, stored, and managed appropriately (e.g., secondary containment, inspections, spill kits) in accordance with applicable regulations to minimize the potential for releases. Contractors could be required to develop and implement their own SPCC Plans. All construction equipment would be maintained according to the manufacturer's specifications and drip mats would be placed under parked equipment as needed.

While no existing contamination is known to occur within the footprint of the proposed roadway improvements, the roadways pass adjacent to several facilities that are known to use, store, or dispose of hazardous materials, hazardous wastes, and petroleum products or with the potential to have environmental contamination. Additionally, the slight possibility exists for the discovery of UXO during construction of the proposed roadway improvements. In the event of the discovery of environmental contamination or UXO during construction of the proposed roadway improvements, all work would be stopped. The proposed roadway improvements would not interfere with the operation of any existing fuel storage or delivery infrastructure on Tinian. Care would be paid to where the existing fuel pipeline between the Port of Tinian and the Commonwealth Utility Corporation power plant crosses beneath the proposed roadway improvements to ensure that a release does not occur.

4.11.3.2 No Action Alternative

Under the No Action Alternative, only minor roadway repairs along the construction and fuel truck routes would occur, as was considered in the 2016 Divert EIS (Final EIS, Section 4.11.2). No impacts on hazardous materials and wastes would occur under the No Action Alternative. The proposed roadway improvements would not occur; therefore, no construction would transpire and hazardous materials and wastes would not be used. Environmental contamination and UXO would have no potential to be discovered.

4.11.4 Summary of Impacts

4.11.4.1 Proposed Actions and Alternatives

The Proposed Actions would have short-term, minor impacts from the use of hazardous materials and petroleum products and the generation of hazardous wastes during construction. All hazardous materials, petroleum products, and hazardous wastes used or generated during construction would be contained, stored, and managed appropriately in accordance with applicable regulations to minimize the potential for releases. Additionally, the possibility exists for the discovery of UXO during construction. If soil or groundwater that is believed to be contaminated or UXO were discovered, the contractor would be required to immediately stop work, report the discovery to USAF, and implement appropriate safety measures.

Long-term, negligible impacts would occur from operation of the proposed fuel pipeline under the West and East routes and the seaport support infrastructure. While a breach or failure of the pipeline could result in a sizable release, a release is unlikely. As described in **Appendix F**, the proposed pipeline and seaport support infrastructure would be designed and constructed in accordance with federal, CNMI, DOD, and USAF regulations for petroleum fuel pipelines and facilities.

4.11.4.2 No Action Alternative

Under the No Action Alternatives, USAF would not construct and operate the fuel pipeline and support infrastructure, and would not construct roadway improvements; however, USAF would construct a fuel storage tank at the seaport, complete only minor road repairs, and use fuel trucks to transport fuel from the seaport to the airport. Long-term, negligible to minor impacts on hazardous materials and wastes would occur from the use of fuel delivery trucks rather than the proposed fuel pipeline. Fuel delivery trucks have a slightly greater potential for a release when compared to a fuel pipeline (Hansen and Dursteler undated, Strata 2017) and the additional fuel storage capacity at the seaport would slightly increase the potential for a release. The 2016 Divert EIS (Final EIS, Section 4.12.2) provides further detail on hazardous materials and wastes impacts from the use of fuel delivery trucks and the fuel storage tanks at the seaport. No impacts on hazardous materials and wastes would occur from not conducting the proposed road improvements.

4.12 Air Quality

4.12.1 Analysis Methodology

The assessment of construction and operations emissions was conducted through use of the Air Force Air Conformity Applicability Model (ACAM), Version 5.0.11.The following items are provided in **Appendix E**:

- ACAM output reports
- Calculation sheets that show how ACAM input parameters were determined
- Emission estimates from ACAM pertaining to activities represented in this SEIS
- Total project emissions for each of the Proposed Actions and alternatives.

The environmental consequences to local and regional air quality conditions near a proposed federal action are determined based upon the increases in regulated pollutant emissions relative to existing conditions and ambient air quality. Specifically, the impact in NAAQS attainment areas is assessed to determine if the net increases in pollutant emissions from the federal action would result in any one of the following scenarios:

- Cause or contribute to a violation of any national, state, commonwealth, or territory ambient air quality standard
- Expose sensitive receptors to substantially increased pollutant concentrations
- Exceed any Evaluation Criteria established by an SIP or permit limitations/requirements
- Emissions representing an increase of 100 tpy for any attainment criteria pollutant or their precursors (O_3 [NO_x and VOCs are precursors to O_3], CO, PM_{10}, $PM_{2.5}$, and SO_2).

The project areas are considered unclassifiable/attainment; however, the 100 tpy threshold was applied in the analysis as a measure of significance. The rationale for applying a 100 tpy threshold is that it is consistent with the highest General Conformity *de minimis* levels for nonattainment areas and maintenance areas. In addition, it is consistent with federal stationary major source thresholds for Title V permitting that formed the basis for the nonattainment *de minimis* levels.

Tinian is in attainment areas for all criteria pollutants; therefore, the General Conformity rule does not apply to any alternative and is not discussed further in the air quality analysis. Additionally, only stationary source emissions are evaluated for PSD and Title V permitting impacts as construction activity emissions are typically not subject to PSD and Title V permitting because they are not caused by stationary sources. The alternatives would not entail major-source significant increases to stationary source emissions from the 2016 Divert EIS (Final EIS, Section 4.2.2); therefore, PSD and Title V permitting significance criteria are not discussed further. HAPs emissions were also considered. However, because of the expected negligible emissions based on the emission source types and the trade winds that carry emissions out to sea, HAPs were omitted in the quantitative analysis both in the 2016 Divert EIS (Final EIS, Section 4.2) and in this SEIS.

GHG emissions resulting from the Proposed Actions have been quantified to the extent feasible in this SEIS. The potential effects of GHG emissions are by nature global and cumulative impacts, as worldwide sources of GHGs contribute to climate change. In an effort to reduce energy consumption, reduce dependence on petroleum, and increase the use of renewable energy resources in accordance with the goals set by EOs and the Energy Policy Act of 2005, DOD implements the DOD Strategic Sustainability Performance Plan. USAF also has a sustainability program in place for reducing carbon dioxide equivalent (CO_2e) emissions through increases in energy/fuel efficiency and using renewable sources where possible. As a result of these objectives, USAF takes proactive measures to reduce their overall emissions of GHGs and the resulting effects on climate change.

For both Proposed Actions, USAF would take reasonable precautions during construction to prevent particulate matter from becoming airborne, based on the construction standards provided in **Appendix F** and the requirements of CNMI Chapter 65-10, Part 415. Construction of the pipeline and roadway improvements would be done in sections (phasing) to minimize the amount of area that is disturbed at one time. Water would be utilized as needed to wet disturbed areas and storage piles prior to backfilling. Where possible, paved roadways would be used to transport materials and workers. Vehicle speeds would be limited to 15 miles per hour (mph) or less at construction sites on unpaved roads. During operations, particulate matter emissions from stationary sources are expected to be minimal, and no off-property visible emissions are expected. USAF would coordinate with CNMI BECQ to obtain the necessary stationary source permits prior to commencing construction of any potential stationary source.

4.12.2 Pipeline and Support Infrastructure

4.12.2.1 West Route

Short- and long-term, direct, negligible to minor impacts would be expected from construction emissions, land disturbance, and use of emergency generators.

Pipeline and Seaport Support Infrastructure Construction. **Table 4.12-1** quantifies the air emissions associated with construction of the pipeline and support infrastructure for the West route and seaport support infrastructure.

Table 4.12-1. Divert Action and West Route Construction Emissions

Construction Emissions by Calendar Year	NO_x (tons)	VOC (tons)	CO (tons)	SO_2 (tons)	PM_{10} (tons)	$PM_{2.5}$ (tons)	CO_2e (metric tons)
Year 1	26.25	4.38	22.79	0.24	97.78	8.11	4,743.26
Year 2	26.25	4.38	22.79	0.24	97.78	8.11	4,743.26
Year 3	26.25	4.38	22.79	0.24	97.78	8.11	4,743.26
Significance Criteria Threshold (tpy)	100	100	100	100	100	100	N/A

Note: Total emissions are those for the construction of the West route pipeline and seaport infrastructure as part of the overall Divert action, and emissions for the seaport fuel storage tanks, fuel loading at seaport, and fuel transfer by truck have been removed. Airport fuel storage is included, as in the 2016 Divert EIS (Final EIS, Section 4.2.2.2).

Air Pollutant Emissions. Minor impacts on regional air quality would be expected during construction primarily from site-disturbing activities, operation of construction equipment,

evaporative emissions from architectural coatings, and materials hauling. Construction emissions are below the air quality significance criteria of 100 tpy**.** Additionally, average daily wind speeds on Tinian of 7 to 15 mph would result in negligible impacts to air quality due to construction. No significant impacts on local and regional air quality is anticipated. In addition, GHG emissions would increase.

Fugitive Dust. Construction projects would generate particulate matter emissions as fugitive dust from ground-disturbing activities. Fugitive dust emissions would be greatest during initial site-preparation activities and would vary from day to day depending on the construction phase, level of activity, and prevailing weather conditions. The quantity of uncontrolled fugitive dust emissions from a construction site is proportional to the area of land being worked and the level of construction activity. Measures identified in **Section 4.12.1** would be employed during construction to reduce and control fugitive dust and to suppress emissions. Specific fugitive dust control measures could include watering the construction surface and phasing work to limit dust, setting up wind fences to limit windblown dust, and limiting vehicle speed to 15 mph or less at construction sites on unpaved roads.

Permitting. Title V permit criteria do not apply, as all sources during construction are mobile sources which are not regulated under the Title V permit program. USAF would coordinate with CNMI BECQ to obtain the necessary stationary source permits prior to commencing construction or installation of any potential stationary source.

The following text describes specific sources of the emissions for construction and installation of the pipeline and support infrastructure, and assumptions used to generate the emissions in ACAM:

- Trenching and excavating. Emissions during trenching and excavating would be expected from earthmoving dust, heavy equipment combustion, worker commutes, and earth hauling associated with trenching for the pipeline and low point drains for 4.08 miles along the conservative 80-foot-wide construction corridor. For purposes of air emission estimates, an average disturbed area at any given time is assumed to be 52,800 square feet. Time between excavation and backfill/re-seeding is expected to be less than 90 days. Construction workers are expected to be housed temporarily in the San Jose area, where the majority of neighborhoods and housing are located on Tinian. The pipeline area's farthest distance from San Jose is approximately 4 miles. The commuting distance would change as the trench is dug. Therefore, the average commute was assumed to be to the mid-point of the pipeline length and back. It was assumed that no significant amount of earth or related materials would be hauled on or off site during trenching and excavating. No credit was taken for dust suppression activities such as watering.
- Pipeline construction. Emissions during pipeline construction would be expected from hauling pipe sections, assembling the pipe along the trench (layout), welding, lowering it in the trench, equipment exhaust and area dust emissions, and worker and vendor commutes. Hauling of pipe sections to pipeline locations would occur from the seaport to the work site, and that distance would vary along the pipeline. For pipeline construction, emissions were estimated based on the maximum expected pipe diameter (2 feet) times the length of the finished pipeline.

- Coating. For potential application of a corrosion-resistant coating to the pipeline, emissions were estimated based on the maximum expected pipe circumference (6.3 feet) times the length of the finished pipeline.
- Grading. Emissions would be expected from backfilling and leveling the ground over the pipeline and were estimated based on a maximum disturbed area before re-seeding of 52,800 square feet. Emissions would also be expected from grading at the seaport for the support infrastructure, including laydown areas and the biosecurity facility. Disturbance at the seaport in the 2016 Divert EIS (Final EIS, Section 2.5.2) was estimated to be 5.39 acres. Under the Proposed Action in this SEIS, land disturbance at the seaport is estimated to be 8.23 acres. Emissions due to the additional grading of 2.94 acres at the seaport were estimated using ACAM. No credit is taken for dust suppression such as watering.
- New construction emissions estimates were not generated for construction of the seaport infrastructure because the impervious footprint for these facilities would be less than for the seaport infrastructure analyzed in the 2016 Divert EIS (Final EIS, Section 2.5.2) (4,550 square feet vs. 7,534 square feet for the bulk storage area). Based on the reduced construction area, construction emissions are assumed to be equal to or less than those in the 2016 Divert EIS (Final EIS, Section 4.2.2.1).

Pipeline and Infrastructure Operation. **Tables 4.12-2** and **4.12-3** identify the air emissions from operation of the West route pipeline and seaport infrastructure.

Table 4.12-2. Divert Action and West Route Operation Criteria Pollutant Emissions

Source Category	PM_{10} (tons)	$PM_{2.5}$ (tons)	CO (tons)	NO_x (tons)	SO_x (tons)	VOC (tons)
Airfield Operations	0.055	0.053	18.67	6.77	0.98	1.25
Commuter Vehicles	0.015	0.012	0.17	0.32	0.00059	0.028
Aircraft Fueling	-	-	-	-	-	0.0042
Fuel Storage Tanks	-	-	-	-	-	1.31
Emergency Generators	0.032	0.032	0.28	1.04	0.00050	0.029
TOTAL	**0.10**	**0.10**	**19.11**	**8.13**	**0.98**	**2.62**
Significance Criteria Threshold (tpy)	100	100	100	100	100	100

Note: Total emissions are those for the operation of the West route pipeline and seaport infrastructure as part of the overall Divert action, and emissions for the seaport fuel storage tanks, fuel loading at seaport, and fuel transfer by truck have been removed. Airport fuel storage is included, as in the 2016 Divert EIS (Final EIS, Section 4.2.2.2).

Table 4.12-3. Divert Action and West Route Operation GHG Emissions

Source Category	CO_2e (pounds)	CO_2e (kilograms)	CO_2e (metric tons)
Airfield Operations	8,833,755	4,006,991	4,007
Commuter Vehicles	183,189	83,095	83
Aircraft Fueling	-	-	-
Fuel Storage Tanks	-	-	-
Emergency Generators	106,600	48,354	48.35
TOTAL	**9,123,545**	**4,138,440**	**4,138**
Significance Criteria Threshold (tpy)	N/A	N/A	N/A

Note: Total emissions are those for the operation of the West route pipeline and seaport infrastructure as part of the overall Divert action, and emissions for the seaport fuel storage tanks, fuel loading at seaport, and fuel transfer by truck have been removed. Airport fuel storage is included, as in the 2016 Divert EIS (Final EIS, Section 4.2.2.2).

Negligible impacts on regional air quality would be expected during pipeline and infrastructure operation from use of emergency generators. Emissions are below the air quality significance criteria of 100 tpy. Additionally, average daily wind speeds on Tinian of 7 to 15 mph would result in negligible impacts to air quality due to construction. No significant impacts on local and regional air quality is anticipated. In addition, GHG emissions would increase.

The following text describes specific sources of the emissions for operation of the pipeline and support infrastructure, and assumptions used to generate the emissions in ACAM:

- Emissions presented do not include fuel transfer by truck emissions, seaport bulk storage emissions, or seaport fuel transfer emissions. Operation of the pipeline removes the need for truck transport of fuel between the seaport and airport, loading of fuel into trucks at the seaport, and standing and working operations of the seaport storage tanks. Emissions from operation were assumed to be insignificant and are not estimated.
- Pipeline leaks and testing. Any airborne leaks from non-welded, aboveground connectors or valves would be minimal. Jet fuel vapor pressure is less than 0.05 pounds per square inch absolute. A small amount of vehicle or testing emissions could occur, if or when pipeline testing is needed. Emissions from leaks and testing are minimal and therefore are not further evaluated.
- Evaporative losses at aboveground, non-welded components and controls. These losses are expected to be less than evaporative losses associated with at-rest loading arms at the seaport and similar components associated with storage tank controls at the airport. Therefore, these minimal emissions are not further evaluated.
- Emergency/standby generator combustion emissions. Emissions were estimated in ACAM assuming diesel fuel for a 500-kilowatt generator at the boom storage facility and for a 400-kilowatt generator at the pump house.

4.12.2.2 East Route

Impacts from construction and operation of the East route pipeline and seaport infrastructure would be similar to those presented in **Section 4.12.2.1** for the West route. Short- and

long-term, direct, negligible to minor impacts would be expected from construction emissions, land disturbance, and use of emergency generators.

Pipeline and Seaport Support Infrastructure Construction. **Table 4.12-4** quantifies the air emissions associated with construction of the pipeline and support infrastructure for the East route and seaport support infrastructure.

Air Pollutant Emissions. Minor impacts on regional air quality would be expected during construction activities primarily from site-disturbing activities, operation of construction equipment, evaporative emissions from architectural coatings, and materials hauling. Construction emissions are below the air quality significance criteria of 100 tpy**.** Additionally, average daily wind speeds on Tinian of 7 to 15 mph would result in negligible impacts to air quality due to construction. No significant impacts on local and regional air quality is anticipated. In addition, GHG emissions would increase.

Table 4.12-4. Divert Action and East Route Construction Emissions

Construction Emissions by Calendar Year	NO_x (tons)	VOC (tons)	CO (tons)	SO_2 (tons)	PM_{10} (tons)	$PM_{2.5}$ (tons)	CO_2e (metric tons)
Year 1	28.20	4.78	24.16	0.25	97.86	8.19	5,124.16
Year 2	28.20	4.78	24.16	0.25	97.86	8.19	5,124.16
Year 3	28.20	4.78	24.16	0.25	97.86	8.19	5,124.16
Significance Criteria Threshold (tpy)	100	100	100	100	100	100	N/A

Note: Total emissions are those for the construction of the West route pipeline and seaport infrastructure as part of the overall Divert action, and emissions for the seaport fuel storage tanks, fuel loading at seaport, and fuel transfer by truck have been removed. Airport fuel storage is included, as in the 2016 Divert EIS (Final EIS, Section 4.2.2.2).

Fugitive Dust. Construction projects would generate particulate matter emissions as fugitive dust from ground-disturbing activities. Fugitive dust emissions would be greatest during initial site-preparation activities and would vary daily depending on the construction phase, level of activity, and prevailing weather conditions. The quantity of uncontrolled fugitive dust emissions from a construction site is proportional to the area of land being worked and the level of construction activity. Measures identified in **Section 4.12.1** would be employed during construction to reduce and control fugitive dust and to suppress emissions. Specific fugitive dust control measures could include watering the construction surface and phasing work to limit dust, setting up wind fences to limit windblown dust, and limiting vehicle speed to 15 mph or less at construction sites on unpaved roads.

Permitting. Title V permit criteria do not apply, as all sources during construction are mobile sources which are not regulated under the Title V permit program. USAF would coordinate with CNMI BECQ to obtain the necessary stationary source permits prior to commencing construction or installation of any potential stationary source.

The following text describes specific sources of the emissions for construction and installation of the pipeline and support infrastructure, and assumptions used to generate the emissions in ACAM. The activities are similar to those for the West route, except the East route would be 0.86 mile longer:

- Trenching and excavating. Emissions during trenching and excavating would be expected from earthmoving dust, heavy equipment combustion, worker commutes, and earth hauling associated with trenching for the pipeline and low point drains for 4.94 miles along the conservative 80-foot-wide construction corridor. For purposes of air emission estimates, an average disturbed area at any given time is assumed to be 52,800 square feet. Time between excavation and backfill/re-seeding is expected to be less than 90 days. Construction workers are expected to be housed temporarily in the San Jose area, where the majority of neighborhoods and housing are located on Tinian. The pipeline area's farthest distance from San Jose is approximately 4 miles. The commuting distance would change as the trench is dug. Therefore, the average commute was assumed to be to the mid-point of the pipeline length and back. It was assumed that no significant amount of earth or related materials would be hauled on or off site during trenching and excavating. No credit was taken for dust suppression activities such as watering.
- Pipeline construction. Emissions during pipeline construction would be expected from hauling in pipe sections, assembling the pipe along the trench (layout), welding, lowering it in the trench, equipment exhaust and area dust emissions, and worker and vendor commutes. Hauling of pipe sections to pipeline locations would occur from the seaport to the work site, and that distance would vary along the pipeline. For pipeline construction, emissions were estimated based on the maximum expected pipe diameter (2 feet) times the length of the finished pipeline.
- Coating. For potential application of a corrosion-resistant coating to the pipeline, emissions were estimated based on the maximum expected pipe circumference (6.3 feet) times the length of the finished pipeline.
- Grading. Emissions would be expected from backfilling and leveling the ground over the pipeline and were estimated based on a maximum disturbed area before re-seeding of 52,800 square feet. Emissions would also be expected from grading at the seaport for the support infrastructure, including laydown areas and the biosecurity facility. Disturbance at the seaport in the 2016 Divert EIS (Final EIS, Section 2.5.2) was estimated to be 5.39 acres. Under the Proposed Action in this SEIS, land disturbance at the seaport is estimated to be 8.23 acres. Emissions due to the additional grading of 2.94 acres at the seaport were estimated using ACAM. No credit is taken for dust suppression such as watering.

New construction emissions estimates were not generated for construction of the seaport infrastructure because the impervious footprint for these facilities would be less than for the seaport infrastructure analyzed in the 2016 Divert EIS (Final EIS, Section 2.5.2) (4,550 vs. 7,534 square feet for the bulk storage area). Based on the reduced construction area, construction emissions are assumed to be equal to or less than those in the 2016 Divert EIS (Final EIS, Section 4.2.2.1).

Pipeline and Infrastructure Operation. **Tables 4.12-5** and **4.12-6** identify the air emissions from operation of the East route pipeline and seaport infrastructure.

Table 4.12-5. Divert Action and East Route Operation Criteria Pollutant Emissions

Source Category	PM_{10} (tons)	$PM_{2.5}$ (tons)	CO (tons)	NO_x (tons)	SO_x (tons)	VOC (tons)
Airfield Operations	0.055	0.053	18.67	6.77	0.98	1.25
Commuter Vehicles	0.015	0.012	0.17	0.32	0.00059	0.028
Aircraft Fueling	-	-	-	-	-	0.0042
Fuel Storage Tanks	-	-	-	-	-	1.31
Emergency Generators	0.032	0.032	0.28	1.04	0.00050	0.029
TOTAL	**0.10**	**0.10**	**19.11**	**8.13**	**0.98**	**2.62**
Significance Criteria Threshold (tpy)	100	100	100	100	100	100

Note: Total emissions are those for the operation of the East route pipeline and seaport infrastructure as part of the overall Divert action, and emissions for the seaport fuel storage tanks, fuel loading at seaport, and fuel transfer by truck have been removed. Airport fuel storage is included, as in the 2016 Divert EIS (Final EIS, Section 4.2.2.2).

Table 4.12-6. Divert Action with East Route Operation GHG Pollutant Emissions

Source Category	CO_2e (pounds)	CO_2e (kilograms)	CO_2e (metric tons)
Airfield Operations	8,833,755	4,006,991	4,007
Commuter Vehicles	183,189	83,095	83
Aircraft Fueling	-	-	-
Fuel Storage Tanks	-	-	-
Emergency Generators	106,600	48,354	48.35
TOTAL	**9,123,545**	**4,138,440**	**4,138**
Significance Criteria Threshold (tpy)	N/A	N/A	N/A

Note: Total emissions are those for the operation of the East route pipeline and seaport infrastructure as part of the overall Divert action, and emissions for the seaport fuel storage tanks, fuel loading at seaport, and fuel transfer by truck have been removed. Airport fuel storage is included, as in the 2016 Divert EIS (Final EIS, Section 4.2.2.2).

Negligible impacts on regional air quality would be expected during pipeline and infrastructure operation from use of emergency generators. Emissions are below the air quality significance criteria of 100 tpy**.** Additionally, average daily wind speeds on Tinian of 7 to 15 mph would result in negligible impacts to air quality due to construction. No significant impacts on local and regional air quality is anticipated. In addition, GHG emissions would increase.

The following text describes specific sources of the emissions for operation of the pipeline and support infrastructure, and assumptions used to generate the emissions in ACAM.

- Emissions presented do not include fuel transfer by truck emissions, seaport bulk storage emissions, or seaport fuel transfer emissions. Operation of the pipeline removes the need for truck transport of fuel between the seaport and airport, loading of fuel into trucks at the seaport, and standing and working operations of the seaport storage tanks. Emissions from operation were assumed to be insignificant and are not estimated.
- Pipeline leaks and testing. Any airborne leaks from non-welded, aboveground connectors or valves would be minimal. Jet fuel vapor pressure is less than 0.05 pound per square inch absolute. A small amount of vehicle or testing emissions could occur, if

or when pipeline testing is needed. Emissions from leaks and testing are minimal and therefore are not further evaluated.

- Evaporative losses at aboveground, non-welded components and controls. These losses are expected to be less than evaporative losses associated with at-rest loading arms at the seaport and similar components associated with storage tank controls at the airport. Therefore, these minimal emissions are not further evaluated.
- Emergency/standby generator combustion emissions. Emissions were estimated in ACAM assuming diesel fuel for a 500-kilowatt generator at the boom storage facility and for a 400-kilowatt generator at the pump house.

4.12.2.3 No Action Alternative

Under the No Action Alternative, USAF would not construct and operate the fuel pipeline or support infrastructure, but would construct fuel storage tanks at the seaport and use fuel trucks to transport fuel from the seaport to the airport. Impacts on air quality would be minor and remain the same as presented in the 2016 Divert EIS (Final EIS, Section 4.2.2), as shown in **Tables 4.12-7** and **4.12-8.** Depending on the air pollutant, emissions under the No Action Alternative would be greater or less than emissions under the Proposed Action.

Table 4.12-7. No Action Alternative Construction Emissions

Construction Emissions by Calendar Year	NO_x (tons)	VOC (tons)	CO (tons)	SO_2 (tons)	PM_{10} (tons)	$PM_{2.5}$ (tons)	CO_2 (metric tons)
Year 1	10.15	1.41	9.18	0.33	77.51	7.83	1,738.30
Year 2	10.15	1.41	9.18	0.33	77.51	7.83	1,738.30
Year 3	10.15	1.41	9.18	0.33	77.51	7.83	1,738.30
Significance Criteria Threshold (tpy)	100	100	100	100	100	100	N/A

Source: USAF 2016a

Table 4.12-8. No Action Alternative Operation Emissions

Source Category	NO_x (tons)	VOC (tons)	CO (tons)	SO_2 (tons)	PM_{10} (tons)	$PM_{2.5}$ (tons)	CO_2 (metric tons)
Airfield Operations	6.77	1.25	18.67	0.98	0.05	0.05	4,007
Fuel Truck and Commuter Vehicle Emissions	0.37	0.03	0.19	0.001	0.02	0.01	93
Fuel Transfer Emissions	N/A	0.01	N/A	N/A	N/A	N/A	0
Fuel Storage Tank Emissions	N/A	1.91	N/A	N/A	N/A	N/A	0
Total Pollutant Emissions	**7.14**	**3.19**	**18.86**	**0.98**	**0.07**	**0.07**	**4,100**
Significance Criteria Threshold (tpy)	100	100	100	100	100	100	N/A

Source: USAF 2016a

4.12.3 Roadway Improvements

4.12.3.1 Proposed Action

Short, direct, negligible to minor impacts would be expected from construction emissions and land disturbance for the road improvements. Some existing road surfaces may not require replacement, so the emissions estimates are conservative. Emissions from construction of roadway improvements are presented in **Table 4.12-9**.

Negligible to minor impacts on regional air quality would be expected during construction activities primarily from site-disturbing activities and operation of construction equipment. Construction would include removal of road materials and application of asphalt paving material. Construction emissions are below the air quality significance criteria of 100 tpy**.** Additionally, average daily wind speeds on Tinian of 7 to 15 mph would result in negligible impacts to air quality due to construction. No significant impacts on local and regional air quality is anticipated.

Table 4.12-9. Construction Emissions – Improved Roadway

Pollutant	Total Emissions (tons)
VOC	0.71
SO_x	0.0093
NO_x	3.80
CO	5.06
PM_{10}	7.77
$PM_{2.5}$	0.20
Pb	0
CO_2e	838.90

Note: Expected completion of road construction would be 1 year.

Measures identified in **Section 4.12.1** would be employed during construction to reduce and control fugitive dust and to suppress emissions. Specific fugitive dust control measures could include watering the construction surface and phasing work to limit dust, setting up wind fences to limit windblown dust, and limiting vehicle speed to 15 mph or less at construction sites on unpaved roads.

Use of these roadways as addressed in the 2016 Divert EIS (Final EIS, Section 4.2.2) and emissions from vehicle use are not presented in this section.

4.12.3.2 No Action Alternative

Under the No Action Alternative, only minor roadway repairs along the construction and fuel truck routes would occur, as was considered in the 2016 Divert EIS (Final EIS, Section 4.11.2). Impacts on air quality would be periodic, long-term, and negligible to minor from intermittent roadway repairs.

4.12.4 Summary of Impacts

4.12.4.1 Proposed Actions and Alternatives

Short- and long-term negligible to minor impacts would be expected on air emissions from the Proposed Actions and alternatives. Construction of pipeline and roadway infrastructure would generate short-term air emissions but would not exceed significance thresholds. Long-term impacts would be expected only from operation of emergency generators for the pipeline and support infrastructure.

4.12.4.2 No Action Alternatives

Under the No Action Alternatives, USAF would not construct and operate the fuel pipeline and support infrastructure, and would not construct roadway improvements; however, USAF would construct a fuel storage tank at the seaport, complete only minor road repairs, and use fuel trucks to transport fuel from the seaport to the airport. Short- and long-term impacts would be expected from emissions associated with construction and operation of the seaport fuel tanks and fuel transfer vehicles.

5. Cumulative Effects and Irreversible and Irretrievable Commitment of Resources

The CEQ regulations stipulate that the cumulative effects analysis in an EIS, or SEIS, should consider the potential environmental consequences resulting from "the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions" (40 CFR § 1508.7).

Actions that have a potential to interact with the Proposed Actions to construct and operate a fuel pipeline and support infrastructure, and construct road improvements, as analyzed in this SEIS, are included in this cumulative effects analysis. This approach enables decision makers to have the most current information available so that they can evaluate the range of environmental consequences that would result from the Proposed Actions. Known construction and operational methods to support the Proposed Actions are a part of the analysis contained in this SEIS; however, potential future requirements cannot be predicted. As those requirements become known in the future, NEPA analysis would be conducted, as required.

In this section, USAF has identified past and present actions on Tinian and in the CNMI. In addition, this analysis also evaluates reasonably foreseeable future actions that are in the planning phase in the region.

The assessment of cumulative effects begins with defining the scope of other project actions and the potential interrelationship they may have with the Proposed Action(s) (CEQ 1997b). The scope of the analysis should consider other projects that coincide with the location and timetable of implementation of the Proposed Action(s). Cumulative impacts can arise from single or multiple actions and through additive or interactive processes acting individually or in combination with each other. Actions that are not part of the proposal, but that could be actions connected in time or space should be considered (40 CFR § 1508.25). This SEIS analysis addresses three questions to identify cumulative effects:

1. Does a relationship exist such that elements of the Proposed Actions or alternatives might interact with elements of past, present, or reasonably foreseeable actions?
2. If one or more of the elements of the alternatives and another action could be expected to interact, would the alternative affect or be affected by impacts of the other action?
3. If such a relationship exists, would an assessment reveal any potentially significant impacts not identified when the alternative is considered alone?

For a proposed action or alternative under consideration to have a cumulatively significant impact on an environmental resource, two conditions must be met. First, the combined impacts of all identified past, present, and reasonably foreseeable projects, activities, and processes on a resource, including the impacts of the proposed action, must be significant. Second, the proposed action must make a substantial contribution to that significant cumulative impact. Proposed actions of limited scope do not typically require as comprehensive an assessment of cumulative impacts as proposed actions that have significant environmental impacts over a large area (CEQ 2005).

5.1 Past, Present and Reasonably Foreseeable Actions

This section provides decision makers with an assessment of the anticipated contribution of impacts from concurrent implementation of the proposed pipeline installation, seaport infrastructure, and roadway improvement construction actions along with other identified past, present, and reasonably foreseeable actions.

Past activities include projects that occurred within the geographic scope of cumulative effects that have shaped the current environmental conditions of the project areas. During the later stages of World War II, Japan occupied, garrisoned and constructed the original airfields on the island of Tinian (DON 2010c). In 1944, the U.S. military seized Tinian from the Japanese and transformed the island into the largest operational base in the world. Since that time, there have been many changes in military operations that involved construction and improvements of the operating areas, support facilities, and infrastructure.

For most resource areas, such as soils and water, biological resources, infrastructure, and hazardous materials and waste, the impacts of past actions are now part of the existing environment and are incorporated in the description of the affected environment in **Section 3**.

Past, present, and reasonably foreseeable projects addressed in the 2016 Divert EIS analysis of cumulative impacts (Final EIS, Sections 5.2.1 and 5.2.2) are hereby incorporated by reference. The 2016 Divert EIS is available for review or download from the project website at: http://pacafdivertmarianaseis.com/archive. Although many additional local (non-DOD) projects were identified beyond those addressed in the 2016 Divert EIS, only those actions determined to be ongoing or projected to occur within the reasonably foreseeable future, and with considerable potential for cumulative impacts if implemented concurrently with the Proposed Action, were considered for the cumulative impacts analysis. Actions deemed small in scale, lacking funding, or still conceptual were excluded from the analysis. The paragraph below describes the proposed Tinian Harbor Improvements that was identified for consideration in the cumulative effects analysis beyond those previously described in the 2016 Divert EIS (Final EIS, Sections 5.2.1 and 5.2.2).

Tinian Harbor Improvements, U.S. Indo-Pacific Command. The U.S. Indo-Pacific Command proposes to improve the Tinian Harbor to support military exercises. Improvements would include concrete pile cap repair, installation of new mooring hardware, concrete pad construction, and installation of new pile cap fenders.

5.2 Cumulative Impacts Analysis

The cumulative impacts analysis for the Modified Tinian Alternative, North Option, in the 2016 Divert EIS (Final EIS, Section 5.3) is hereby incorporated by reference. The 2016 Divert EIS is available for review or download from the project website at: http://pacafdivertmarianaseis.com/archive.

While the Proposed Actions described in this SEIS would be conducted in addition to the Proposed Action described in the 2016 Divert EIS, the resulting cumulative impacts from implementation of these actions in combination with the identified cumulative projects would be

similar to those described in the 2016 Divert EIS for noise, biological resources, cultural resources, environmental justice and protection of children, health and safety, land use, hazardous materials and wastes, and air quality. The potential for concurrent construction projects on Tinian would increase and cumulative impacts on these resource areas could be expected from increases in ground disturbance, vehicle/equipment use, and construction workers during construction and fuels and stormwater management once construction is complete. These types of cumulative impacts are discussed in the 2016 Divert EIS (Final EIS, Section 5.3) and the overall context and intensity of impacts is expected to be similar to those presented in the 2016 Divert EIS. Generally, implementation of the two Proposed Actions would incur negligible to minor impacts on resources, with some action components resulting in temporary, moderate impacts. Sections 5.2.1 through 5.2.3 describe cumulative impacts on resources areas that would differ from those presented in the 2016 Divert EIS.

5.2.1 Socioeconomics

Cumulative impacts on population, public services, the economy, and sociocultural issues would be similar to those described in the 2016 Divert EIS (Final EIS, Section 5.3.14.2.1) from the influx of workers associated with the cumulative projects proposed on the island. However, impacts on housing would be greater (moderate) than those described in the 2016 Divert EIS (minor) if multiple cumulative projects, including the two Proposed Actions to support the Divert mission, were implemented concurrently and a shortage of hotel rooms for workers could occur.

5.2.2 Soils and Geology

Types of cumulative impacts on soils and geology would be similar to those described in the 2016 Divert EIS (Final EIS, Section 5.3.4.2.1) from soil disturbance, compaction, erosion, and sedimentation during construction. However, impacts on soils and geology would be greater (minor to moderate) than those described in the 2016 Divert EIS (minor) if construction of all cumulative projects, including the two Proposed Actions described in this SEIS, were implemented concurrently.

5.2.3 Infrastructure and Transportation

Cumulative impacts on airfield, electrical supply, liquid fuel supply, and water supply infrastructure on Tinian would be similar to those described in the 2016 Divert EIS (Final EIS, Section 5.3.13.2.1) from multiple construction projects and construction workers on Tinian. Short-term cumulative impacts on the seaport would be slightly greater than those described in the 2016 Divert EIS (Final EIS, Section 5.3.13.2.1) from construction of the seaport infrastructure and the proposed harbor improvements; however, long-term beneficial impacts are expected from these improvements. Additionally, construction required for the Proposed Actions and cumulative projects would generate considerable quantities of waste debris that could have a greater impact on Tinian solid waste than described in the 2016 Divert EIS. While debris would be recycled or composted to the extent practicable, landfilled construction debris would be considered long-term, irreversible impacts on solid waste management infrastructure. Additionally, implementation of the Proposed Actions would contribute major, direct, beneficial impacts on the liquid fuel supply by adding capacity to store and distribute jet fuel.

Cumulative impacts on transportation infrastructure would also temporarily be greater than those presented in the 2016 Divert EIS (Final EIS, Section 5.3.11.2.1). If all cumulative construction projects were to occur simultaneously, more construction workers could be on the island for weeks or months at a time. Increased traffic congestion would reduce the current roadway levels of service and cause additional stress to road surfaces resulting in deterioration (e.g., rutting, cracking, and breakup) of pavements. However, once completed, roadway improvements on the island would be expected to help limit traffic congestion and maintain road surfaces and safe driving conditions in the long term.

5.3 Irreversible and Irretrievable Commitment of Resources

An irreversible or irretrievable commitment of resources refers to impacts on or losses to resources that cannot be reversed or recovered, even after an activity has ended and facilities have been decommissioned. A commitment of resources is related to use or destruction of nonrenewable resources, and the impacts that loss will have on future generations.

Construction and operation of infrastructure at the Tinian airport and seaport, and construction of roadway improvements would involve the irreversible and irretrievable commitment of materials, energy, terrestrial biota and soil, landfill space, and human resources.

***Materials*.** Material resources irretrievably used for pipeline installation, seaport infrastructure construction, and roadway improvements would include steel, concrete, and other building materials. Such materials are not in short supply and would not be expected to limit other unrelated construction activities. The irretrievable use of material resources would not be considered significant.

Energy. Energy resources used for the Proposed Actions would be irretrievably lost. These include fossil fuels (e.g., gasoline, diesel, natural gas) and electricity. During construction and operation of the Proposed Actions, gasoline and diesel fuel would be used for the operation of construction vehicles, transportation vehicles, and equipment. Overall, consumption of energy resources would not place a significant demand on their availability in the region. Therefore, no significant impacts would be expected.

***Terrestrial Biota and Soils*.** Pipeline installation and roadway improvements would result in some irretrievable loss of wildlife habitat and soil resources. This result would be a permanent loss or conversion.

Landfill Space. The generation of construction debris and subsequent disposal of that debris in a landfill would be an irretrievable impact. Construction contractors would be expected to recycle, to the greatest extent possible, any debris that is generated. Recycling wastes would reduce irretrievable impacts on landfills. However, any waste generated by the Proposed Action that is disposed of in a landfill would be considered an irretrievable loss of that landfill space.

Human Resources. The use of human resources for construction is considered an irretrievable loss in that it would preclude such personnel from engaging in other work activities. However, use of human resources represents employment opportunities and is considered beneficial.

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9. Glossary

A-weighted decibel (dBA): Decibel measurement on the "A-weighting" scale. A decibel adjusted (weighted) to reflect the relative loudness of sounds most sensitive to human ears.

Air Force Instruction (AFI): Instructions implementing U.S. laws and regulations, and providing policy for USAF personnel and activities.

Air Quality: The degree to which the ambient air is pollution-free, assessed by measuring a number of indicators of pollution.

Bird/Wildlife-Aircraft Strike Hazard (BASH): A USAF program to reduce the possibilities of bird or wildlife collisions with aircraft.

Clean Air Act (CAA): This Act empowered the U.S. Environmental Protection Agency to establish standards for common pollutants that represent the maximum levels of background pollution that are considered safe, with an adequate margin of safety to protect public health and safety.

Clean Water Act (CWA): The primary federal law in the United States governing water pollution. The CWA established the goals of eliminating releases of high amounts of toxic substances into water, eliminating additional water pollution, and ensuring that surface waters would meet standards necessary for human sports and recreation.

Council on Environmental Quality (CEQ): The CEQ is within the Executive Office of the President and is composed of three members appointed by the President, subject to approval by the Senate. Members are to be conscious of and responsive to the scientific, economic, social, esthetic, and cultural needs of the nation; and to formulate and recommend national policies to promote the improvement of environmental quality.

Day-Night Average Sound Level (DNL): The average sound energy in a 24-hour period with a 10 decibel (dB) penalty added to the nighttime levels of 10 p.m. to 7 a.m.

Decibel (dB): A unit used to express the intensity of a sound wave, equal to 20 times the common logarithm of the ratio of the pressure produced by the sound wave to a reference pressure, usually 0.0002 microbar.

***De Minimis* Threshold:** The minimum threshold for which a conformity determination must be performed for various criteria pollutants in various areas.

Endangered Species: The Endangered Species Act of 1973 defined the term "endangered species" to mean any species (including any subspecies of fish or wildlife or plants, and any distinct population segment of any species or vertebrate fish or wildlife which interbreeds when mature) that is in danger of extinction throughout all or a significant portion of its range.

Environmental Justice: Pursuant to EO 12898, Federal Actions to Address Environmental Justice in Minority and Low-Income Populations, review must be made as to whether a federal program, policy, or action presents a disproportionately high and adverse human health or

environmental effect on minority and/or low-income populations. Environmental Night: The period between 10 p.m. and 7 a.m. when 10 dB is added to aircraft noise levels due to increased sensitivity to noise at night.

Fiscal Year: U.S. government accounting year beginning 1 October through 30 September.

Groundwater: Water held underground in the soil or in pores and crevices in rock.

Floodplain: An area of low-lying ground adjacent to a river, formed mainly of river sediments and subject to flooding.

Hazardous Material: Solids, liquids, or gases that can harm people, other living organisms, property, or the environment.

Hazardous Waste: Waste that poses substantial or potential threats to public health or the environment. In the United States, the treatment, storage and disposal of hazardous waste is regulated under the Resource Conservation and Recovery Act.

Important Farmland: Important farmland is a designation assigned by the U.S. Department of Agriculture. Important farmland is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops. The land is also used as cropland, pastureland, rangeland, forest land, or other land, but cannot be used as urban built-up land or water.

Mean Sea Level (MSL): Altitude expressed in feet measured above average sea level.

Mobile Sources: Includes cars and light trucks, heavy trucks and buses, nonroad engines, equipment, and vehicles.

National Ambient Air Quality Standards (NAAQS): NAAQS are established by USEPA for criteria pollutants that represent the maximum levels of background pollution considered safe, with an adequate margin of safety, to protect public health and safety.

National Environmental Policy Act (NEPA): The NEPA of 1969 directs federal agencies to take environmental factors into consideration in their decisions.

National Historic Preservation Act (NHPA): The NHPA of 1966, as amended, established a program for the preservation of historic properties throughout the United States.

National Register of Historic Places (NRHP): The NRHP is the federal government's official list of districts, sites, buildings, structures, and objects deemed worthy of preservation.

Scoping: A NEPA process of identifying the main issues of concern at an early stage in planning in order to discover any alternatives and aid in site selection.

Threatened Species: A species likely to become endangered within the foreseeable future throughout all, or a significant portion, of its range.

Traditional and Cultural Resource: Traditional and cultural resources are any prehistoric or historic district, site or building, structure, or object considered important to a culture, subculture, or community for scientific, traditional, religious, or other purposes.

Wetland, Jurisdictional: A jurisdictional wetland is a wetland that meets all three of USACE's criterion for jurisdictional status: appropriate hydrologic regime, hydric soils, and facultative to obligate wetland plant communities under normal growing conditions.

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