UNIVERSITY OF GUAM CULTURAL REPOSITORY FACILITY
LOT 5372-3A, MAGA, MUNICIPALITY OF MANGILAO
ISLAND OF GUAM

DRAFT ENVIRONMENTAL ASSESSMENT

JUNE 10, 2020

OEA

Prepared by:

University of Guam
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UOG Station
Mangilao, Guam 96923
for
The Office of Economic Adjustment, U. S. Department of Defense

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SUMMARY SHEET

Project Name:	University of Guam Cultural Repository Facility Lot 5372-3A, Maga, Municipality of Mangilao, Island of Guam
Proposed Action:	Planning, design, and construction of a cultural repository on the Island of Guam. The project consists of an approximately 13,000-square foot federally compliant cultural repository building and associated parking. Construction would include site clearing and grading, utility connections (water, sewer, electrical, telecommunications, etc.), facility construction, access roads and parking, site drainage, and security fencing to restrict access and secure the perimeter of the facility. The facility would include sections or rooms for administration, meetings, servers, break, janitorial, conservation, mechanical and electrical, storage and processing, and photographs. Men's and Women's Restrooms would be included as would conservation rooms, wet and dry labs, and high-density collection storage spaces. Specialized equipment necessary for operating, sustaining, and maintaining optimal environmental conditions and protections would also be included, such as system redundancy through an uninterruptible power supply with battery back-up, emergency lighting, and a 75kW generator; a walk-in freezer room; an environmental data logging system; a rolling service door, and a clean agent (water-free) fire suppression system.
Project Owner:	University of Guam
Agent for the Owner:	Myounghee Noh & Associates, L.L.C. 99-1046 Iwaena Street, Suite 210A Aiea, Hawaii 96701 Contact: Jessica Walsh Phone: 808-484-9214 Email: Jessica@noh-associates.com
Approving Agency:	U.S. Department of Defense Office of Economic Adjustment 1325 J Street, Suite 1500 Sacramento, California 95814
Project Location:	Lot 5372-3A, por.
Recorded Fee Owner:	Government of Guam
Area:	Approx. 5 acres
Existing Use:	Vacant
Determination:	Anticipated Finding of No Significant Impact

ACRONYMS AND ABBREVIATIONS

ACHP	Advisory Council on Historic Preservation
ADA	Americans with Disabilities Act
AHPA	Archaeological and Historic Preservation Act
AIS	Archaeological Inventory Survey
APE	Area of Potential Effect
BA	Biological Assessment
BMP	best management practices
CAA	Clean Air Act
CEQ	Council on Environmental Quality
CBRA	Coastal Barrier Resources Act
CFR	Code of Federal Regulations
CNMI	Commonwealth of the Northern Mariana Islands
CO	carbon monoxide
CZMA	Coastal Zone Management Act
DAWR	Guam Department of Agricultural Division of Aquatic and Wildlife Resources
EA	Environmental Assessment
EO	Executive Order
EIS	Environmental Impact Statement
ERIS	Environmental Risk Information Services
ESA	Endangered Species Act
FEMA	U.S. Federal Emergency Management Agency
FWCA	Fish and Wildlife Coordination Act
GCA	Guam Code Annotated
GEPA	Guam Environmental Protection Agency
GHPI	Guam Historic Properties Inventory
GPA	Guam Power Authority
GWA	Guam Waterworks Authority
HASP	Health and Safety Plan
kV	kilovolts
LID	low impact development
LQG	Large Quantity Generator
MGD	million gallons per day
NAAQS	National Ambient Air Quality Standard
NCN	no common name
NEPA	National Environmental Policy Act
NGLA	Northern Guam Lens Aquifer
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NO_2	nitrogen dioxide
NPS	U.S. National Park Service
NRHP	National Register of Historic Places
O_3	ozone
OEA	U.S. Office of Economic Adjustment
Pb	lead
PCB	polychlorinated biphenyls
PM	particulate matter
SHPO	State Historic Preservation Act
SO_2	sulfur dioxide
UOG	University of Guam
USC	U.S. Code
USFWS	U.S. Fish & Wildlife Service
UST	Underground Storage Tank
WA	Wilderness Act

1.0 BACKGROUND

1.1 Introduction

The U.S. Department of Defense Office of Economic Adjustment (OEA) awarded a grant to the Office of the Governor, with the University of Guam (UOG) being a sub-recipient responsible for the planning, design, and construction of the cultural repository on the Island of Guam.

The purpose of this Environmental Assessment (EA) is to comply with National Environmental Policy Act (NEPA) documentation requirements for the proposed federal action under consideration, which consists of the funding to construct a cultural repository facility that meets collections-facility design standards. In the *2011 Programmatic Agreement Among the Department of Defense, the Advisory Council on Historic Preservation, the Guam State Historic Preservation Officer, and the Commonwealth of the Northern Mariana Islands State Historic Preservation Officer Regarding the Military Relocation to the Islands of Guam and Tinian* (2011 PA), the Department of Defense committed to seeking Congressional authorization and appropriation to support the construction of a Guam Cultural Repository.

The Guam Military Build-Up Final and Supplemental Environmental Impact Statements (EIS) identified anticipated effects to historical, archaeological, and cultural resources. Subsequently, the 2011 PA was developed that identified the need for a streamlined process to address the National Historic Preservation Act (NHPA) Section 106 consultation for development projects under the Military Build-Up EIS. Additionally, an increase in the number of archaeological objects discovered was projected as the scheduled construction continues. Therefore, increased storage capacity is essential to ensure that adequate space, providing conservation-minded protections to meet both current and future demands. This EA was prepared using the Council on Environmental Quality (CEQ) regulations 40 Code of Federal Regulations (CFR) Parts 1500-1508 as guidance. This EA documents the environmental consequences on Guam of the proposed federal action.

1.2 Project Location and Area of Concern

Guam is an unincorporated and organized territory of the United States, located 900 miles north of the Equator in the western Pacific Ocean. As part of a relatively isolated island chain, Guam is situated 3,800 miles west of Hawaii and 1,400 miles east of Manila, Philippines. With an area of 212 square miles, Guam is the largest in the Mariana island chain.

Guam is divided geologically into two regions separated by the Pago-Adelup Fault. The southern portion of Guam includes rugged volcanic highlands with protected embayments and ravines, while the northern half of Guam is a broad limestone plateau bounded by sea cliffs. The proposed project is situated on the northern limestone plateau, in eastern central Guam.

The proposed project is located less than 1/2 mile north of Pago Bay. The site, Lot 5372-3A, is a 10.5-acre lot and currently vegetated and undeveloped. The proposed action is planned for the southeast quadrant of the parcel, approximately 2.5 acres. Lot 5372-3A is located within the University of Guam Vision 2025 Master Plan and is bound by University Avenue on the east. The project site is located adjacent to the UOG campus, and accessible by Route 32, or University Drive. The undeveloped land north of the project site is a potential site for a future parking lot. A 40-foot public access and utility easement bounds the project site on the south, where the UOG intends to build a formal roadway, Atbut Lane.

Figure 1. Site Map
UOG Development Cultural Resources Repository
Lot 5372-3A, Maga, Mangilao, Guam

1.3 Purpose and Need for the Proposed Action

Currently there is a deficiency in up-to-standard storage space for archaeological objects discovered during construction activities. The 2011 PA was developed in response to the Guam Military Build-Up Final and Supplemental Environmental Impact Statements to identify anticipated effects to historical, archaeological, and cultural resources, and the need for a streamlined process to address the NHPA Section 106 consultation for development projects under the Military Build-Up EIS. Additionally, an increase in the number of archaeological objects discovered was projected as the scheduled construction continues. Therefore, increased storage capacity is essential to ensure that adequate space, providing conservation-minded protections to meet both current and future demands.

1.4 Scope of EA

This EA focuses on the proposed Guam Cultural Repository Facility and the potential direct, indirect (secondary), and cumulative environmental impacts that may arise from the implementation of the Proposed Action, the no action, or any other action alternative considered.

In preparing an EA, OEA examines various federal cross-cutting laws and Executive Orders (EO). These laws and EOs are described below:

National Natural Landmarks - The Secretary of the Interior is authorized to designate areas as National Natural Landmarks for listing on the National Registry of Natural Landmarks pursuant to the Historic Act of 1935, 16 U.S. Code (USC) 461 et seq. In conducting the environmental review of the Proposed Action, OEA is required to consider the existence and location of natural landmarks, using information provided by the National Park Service (NPS) pursuant to 36 CFR 62.6(d). No natural landmarks listed on the National Registry of Natural Landmarks were identified within the Project Area.

Cultural Resources Data - The Archaeological and Historic Preservation Act (AHPA) of 1974, 16 USC 469 et seq. provides for the preservation of cultural resources data if an OEA activity may cause irreparable loss or destruction of significant scientific, prehistoric, or archaeological data. In accordance with the AHPA, the responsible official or the Secretary of the Interior is authorized to undertake data recovery and preservation activities.

Cultural Resources - The NHPA, as amended, 16 U.S.C. 470, directs federal agencies to integrate historic preservation into all activities which either directly or indirectly involve land use decisions. The NHPA is administered by the NPS, the Advisory Council on Historic Preservation (ACHP), State Historic Preservation Officers (SHPO), and each federal agency. Implementing regulations include 36 CFR Part 800: Regulations of the Advisory Council on Historic Preservation Governing the NHPA Section 106 Review Process. Section 106 of the NHPA requires federal agencies to take into consideration the impact that an action may have on historic properties which are included on, or are eligible for inclusion on, the National Register of Historic Places (NRHP). The Section 106 review process is usually carried out as part of a formal consultation with the SHPO, the ACHP, and other parties, such as indigenous groups or nongovernmental organizations, that have knowledge of, or a particular interest in, historic resources in the area of the undertaking. Impacts to Cultural Resources are discussed in Section 3.3.

Wetlands Protection - EO 11990, “Protection of Wetlands” of 1977, requires federal agencies conducting certain activities to avoid, to the extent possible, adverse impacts associated with the destruction or loss of wetlands and to avoid support of new construction in wetlands, if a

practicable alternative exists. Discharge of dredged or fill material into wetlands and other waters of the U.S. are also regulated under Section 404 of the Clean Water Act. No wetlands in the U.S. will be filled or otherwise impacted by the Proposed Action.

Floodplain Management - EO 11988, "Floodplain Management" of 1977, requires federal agencies to evaluate the potential effects of actions they may take in a floodplain to avoid, to the extent possible, any adverse effects associated with the direct and indirect development of a floodplain. None of the aspects of the Proposed Action occurs within a Federal Emergency Management Agency (FEMA) designated floodplain.

Important Farmlands - OEA policy to Protect Environmentally Significant Agricultural Lands requires OEA to consider the protection of the nation's significant/important agricultural lands from irreversible conversion to uses that result in their loss as an environmental resource or essential food production resource. Moreover, the Farmland Protection Policy Act, 7 USC 4201 et seq., and the U.S. Department of Agriculture's implementing procedures require federal agencies to evaluate the adverse effects of their actions on prime and unique farmland, including farmland of statewide and local importance. The project does not involve conversion of, or otherwise affect, prime, unique, or important farmland.

Coastal Zone Management Act - The Coastal Zone Management Act (CZMA), 16 USC 1451 et seq., requires that federal agencies in coastal areas be consistent with approved State Coastal Zone Management Programs, to the maximum extent possible. Specific federal licenses and permits and federal financial assistance are covered under Guam's Coastal Zone Management program. The funding source for the cultural repository project is not financial assistance subject to Federal Consistency review.

Coastal Barrier Resources Act - The Coastal Barrier Resources Act, 16 USC 3501 et seq., generally prohibits new federal expenditures and financial assistance for development within the Coastal Barrier Resources System and therefore protects ecologically sensitive U.S. coastal barriers. This project does not affect any coastal barriers.

Wild and Scenic Rivers - The Wild and Scenic Rivers Act, 16 USC 271 et seq., establishes requirements applicable to water resource projects affecting wild, scenic, or recreational rivers within the National Wild and Scenic Rivers System, as well as rivers designated on the National Rivers Inventory. No designated wild and scenic rivers occur within the Project Area.

Fish and Wildlife Protection - The Fish and Wildlife Coordination Act (FWCA), 16 USC 661 et seq., requires federal agencies involved in actions, that will result in the control or structural modification of any natural stream or body of water for any purpose, to take action to protect the fish and wildlife resources that may be affected by the action. No U.S. streams or water bodies will be modified by this project.

Endangered Species Protection - The Endangered Species Act, 16 USC 1536 et seq., prohibits agencies from jeopardizing threatened or endangered species or adversely modifying habitats essential to their survival. Impacts on endangered species are discussed in Section 3.2.3.

Wilderness Protection - The Wilderness Act (WA), 16 USC 1131 et seq., establishes a system of National Wilderness Areas. The WA establishes a policy for protecting this system by generally prohibiting motorized equipment, structures, installations, roads, commercial enterprises, aircraft landings, and mechanical transport. No wilderness areas occur within the Project Area.

Air Quality - The Clean Air Act requires federal actions to conform to any state implementation plan approved or promulgated under Section 110 of the Act. Under the Federal Rule on General

Conformity, 40 CFR Part 93, a conformity determination is required only when emissions occur in a non-attainment area. Impacts to air quality from the Alternatives are discussed in Section 3.1.1.

Environmental Justice - EO 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," and the accompanying presidential memorandum, advise federal agencies to identify and address, whenever feasible, disproportionately high and adverse human health or environmental effects on minority communities and/or low-income communities. Environmental justice considerations are discussed in Section 3.9.

2.0 DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

The project consists of an approximately 13,000-square foot federally compliant cultural repository building and associated parking. Construction would include site clearing and grading, utility connections (water, sewer, electrical, telecommunications, etc.), facility construction, access roads and parking, site drainage, and security fencing to restrict access and secure the perimeter of the facility. The facility would include sections or rooms for administration, meetings, servers, break, janitorial, conservation, mechanical and electrical, storage and processing, and photographs. Men's and Women's Restrooms would be included as would conservation rooms, wet and dry labs, and high-density collection storage spaces. Specialized equipment necessary for operating, sustaining, and maintaining optimal environmental conditions and protections would also be included, such as system redundancy through an uninterruptible power supply with battery back-up, emergency lighting, and a 75kW generator; a walk-in freezer room; an environmental data logging system; a rolling service door, and a clean agent (water-free) fire suppression system. Two alternative locations were considered as a part of this environmental assessment, as described in the following sections.

Water utilities, including wastewater, domestic water, and fire service water, would service the building along their respective main lines on Route 32 according to Guam Water Authority requirements.

The parking layout design would meet the requirements in the most current Guam Code Annotated (GCA), Title 21, Chapter 61. The design will be in accordance with Guam Department of Public Works standards to facilitate vehicle circulation, including paved access for parking, deliveries, and maintenance of building systems, and emergency vehicle access throughout the site.

During operations, at least five essential personnel would be assigned to the facility, including a Curator of Archaeological Collections, Collection Manager, Archivist and Records Manager, Archaeological Technician, and Archival Technician. Additional personnel could be periodically present for research, training, or presentations.

2.1 Alternative A – Southeast Quadrant of Lot 5372-3A [Preferred Alternative]

Under Alternative A, the facility would be built on approximately 2 1/2 acres in the southeast quadrant of the lot (Figure 2). Access and parking design would include two concrete driveways adjoining University Drive and a two-way paved parking aisle. A paved turn-around would be provided at the south end of the parking area for fuel truck access and mobility. Parking would include 13 regular stalls, one Americans with Disabilities Act (ADA)-compliant stall, and one

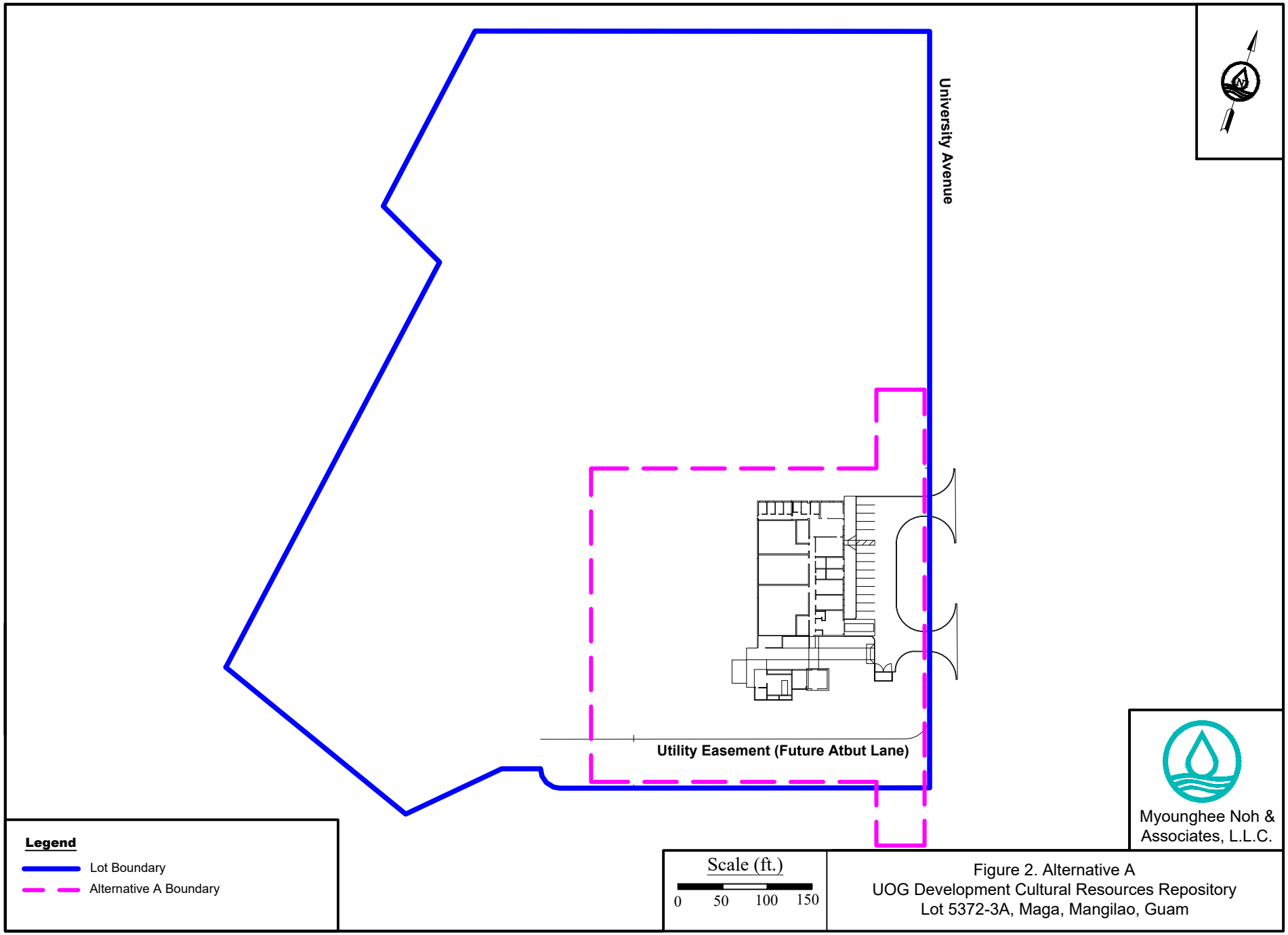
paved parking stall each for one 30-foot box truck and one 40-foot semi truck in front of the building's loading/receiving area.

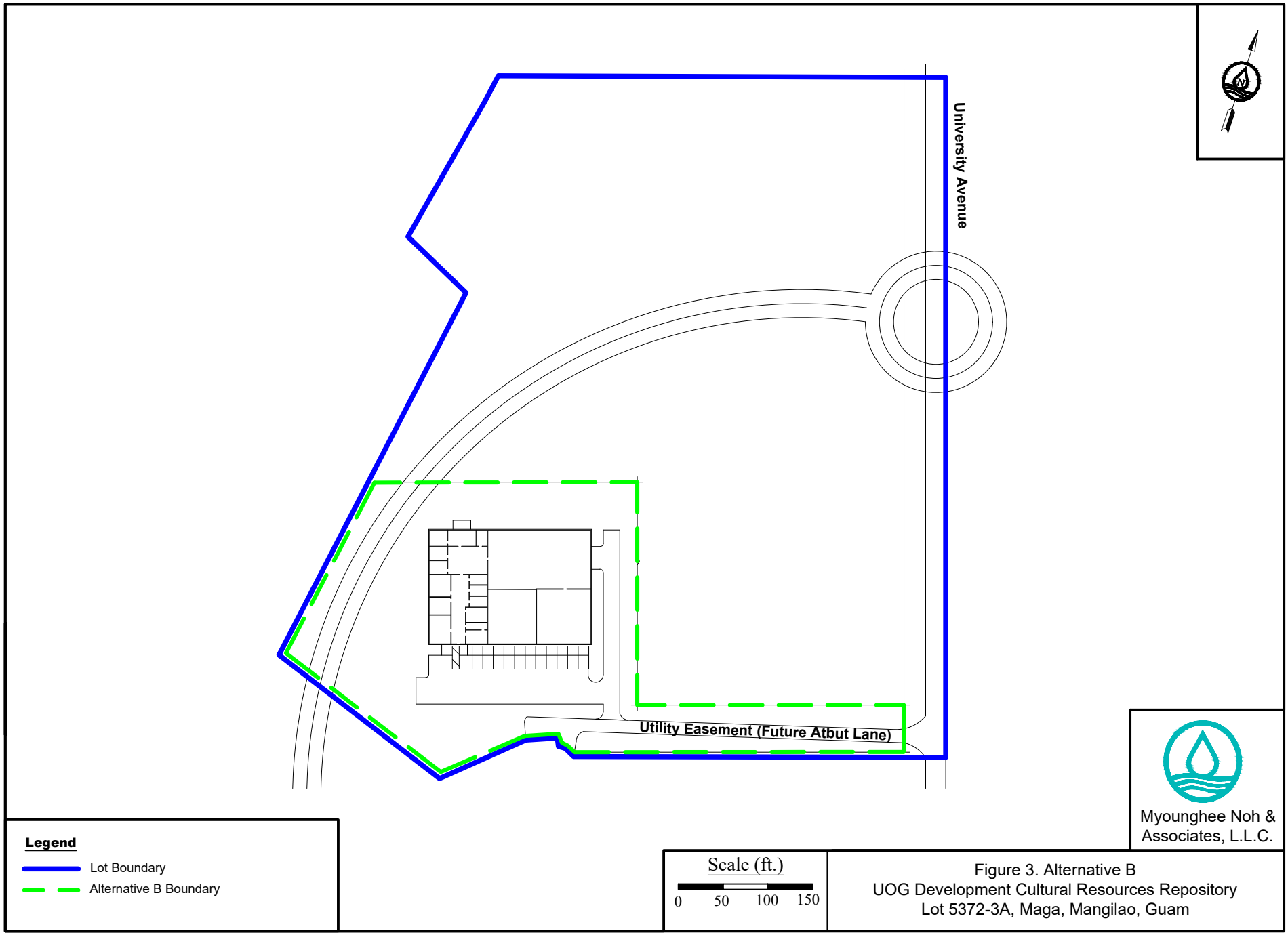
2.2 Alternative B – Southwest Quadrant of Lot 5372-3A

Under Alternative B, the facility would be built on approximately 2 1/2 acres in the southwest quadrant of the lot (Figure 3). Access would be along the future improved Atbut Lane. Parking would be along the south boundary of the site, with the loading and unloading area to the east of the facility.

2.3 Alternative C – No Action

No cultural repository would be built on Guam. In the No Action Alternative, the current situation will continue as the project will not be engineered nor constructed. The existing surplus of archaeological objects will continue to be stored haphazardly without proper conditions for long-term storage. Eventually, deterioration of the cultural resources will cause a loss of integrity. Future archaeological resources discovered during construction projects will continue to have no up-to-standard storage space ensuring proper preservation.


University Avenue
Utility Easement (Future Atbut Lane)
Legend
Lot Boundary
Alternative A Boundary
Scale (ft.)
0 50 100 150
Myounghee Noh & Associates, L.L.C.
Figure 2. Alternative A
UOG Development Cultural Resources Repository
Lot 5372-3A, Maga, Mangilao, Guam


University Avenue
Utility Easement (Future Atbut Lane)
Legend
Lot Boundary
Alternative B Boundary
Scale (ft.)
0 50 100 150
Myounghee Noh & Associates, L.L.C.
Figure 3. Alternative B
UOG Development Cultural Resources Repository
Lot 5372-3A, Maga, Mangilao, Guam

3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

3.1 Physical Environment

3.1.1 Air Resources

Affected Environment

Air quality concerns the level of select pollutants in ambient air with the potential impact to the human and natural environment. Under the Clean Air Act (CAA), six contaminants are designated as criteria pollutants: carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), particulate matter (PM), lead (Pb), and sulfur dioxide (SO_2). The project site is located in EPA attainment zones which air quality pollutant levels are below the National Ambient Air Quality Standard (NAAQS) regulated by the CAA.

The facility will include new stationary air emission sources, specifically two standby generators. The first generator will provide 100% back-up power with 500 kilowatts (670 HP). The second generator will provide power to critical loads only, approximately 400 kilowatts (540 HP). The two generators will be connected such that the second generator will only be energized when the first generator fails to operate.

Environmental Consequences

Short-Term/Construction

Alternatives A and B would result in less than significant short-term impacts to air quality arising from construction activities. Short-term air quality impacts would occur from the generation of fugitive dust during construction activities. Applicable construction best management practices (BMP) would be implemented during construction activities in order to control fugitive dust emissions. These BMPs would include water-misting active work areas and unpaved work roads, use of dust barriers, establishment of a routine road cleaning and/or tire washing program, paving of parking areas, establishment of landscaping early in the construction schedule, and monitoring dust at the project boundary.

The use of construction equipment and personal vehicles to access the project site could lead to temporary increases in vehicular airborne pollutant concentrations. To reduce vehicle and equipment emissions, quality controls with properly functioning equipment would be used during regular construction work practices. Further, increased vehicular emissions would occur, due to disruption of traffic caused by construction equipment and/or commuting site workers. These increased vehicular emissions would be alleviated by moving equipment and personnel to the project site during off-peak traffic hours. As a result, Alternatives A and B would not impose significant impacts to air quality.

Long-term/Operational Use

Any increase in post-construction period air quality impacts would be expected to be negligible for both Alternatives A and B. Two generators would be installed at the site. The generators would meet the Tier 4 emission standards and certification requirements for a diesel engine in accordance with 40 CFR 1039 Control of Emissions from New and In-Use

Nonroad Compression-Ignition Engines. A Standby Generator Permit and Construction and Operating Permit would be obtained from Guam Environmental Protection Agency (GEPA) in accordance with Section 1104.6 of Public Law 24-322, the Guam Air Pollution Control Standards and Regulations. The permit is required if the generator capacity is greater than 65 kilowatts (85 HP). Long-term impacts to air quality due to increased vehicular traffic are not expected to be significant since the facility would have fewer than 20 parking stalls for facility employees and visitors.

No Action

The No Action Alternative would not generate new sources of air emissions and would not affect air quality, unless any illegal dump activities involve volatile chemicals or powdery substances. No mitigation is required.

3.1.2 Water Resources

3.1.2.1 Surface Water

Affected Environment

In general, there is a lack of any substantial or permanent surface water bodies in the northern limestone plateau near the proposed project site. Due to the limestone-karst geology found in this area, precipitation and runoff quickly infiltrates through the upper soil layer and eventually recharges the underlying groundwater aquifer.

Pago Bay is the nearest surface water body located approximately 0.25 mile (1,335 feet) to the south.

Environmental Consequences

Short-Term/Construction

Due to the quick infiltration of precipitation at the project site, minimal effects on surface water are anticipated with Alternatives A and B. A site-specific Stormwater Pollution Prevention Plan should be prepared prior to any construction activities. Prior to construction, erosion and sediment control devices would be installed. During construction, appropriate BMPs should be implemented to minimize potential affects. BMP include dust control measures, such as water-misting and use of dust barriers. Additionally, stockpiles should be bermed, as well as covered during non-work hours to prevent runoff. Drain inlet socks should be used to cover any storm drains at the project site to prevent runoff from entering the storm drains. Disturbed soil along road easements should be revegetated or covered as quickly as possible. Construction activities should be planned during the dry season (January to May), if feasible, to minimize the occurrences of runoff caused by precipitation. Wet season BMPs may be stopping earthwork during heavy rain periods, the use of drain inlet socks to prevent runoff into storm drains, and berming and covering all stockpiles during rain periods and non-work hours.

Long-term/Operational Use

Existing drainage patterns would be maintained as much as possible. The new stormwater system would be an extension of the existing storm sewer system located adjacent to the project site, within the Route 32 right-of-way. The new storm sewer system and connections to the existing system would be in accordance with the utility provider's requirements, GEPA stormwater management laws and regulations, and project sustainability goals; whichever is more stringent. A bioswale would be provided along the north, south, and east sides of the proposed facility. The bioswale would be designed to retain a required amount of runoff and to allow the runoff to percolate into the ground at a required rate, and would meet the requirements of Chapter 3, Commonwealth of the Northern Mariana Islands (CNMI)/Guam Stormwater Management Manual. BMPs to address water quality may include bioretention, grassed swales, bioretention swales, infiltration trenches, rain gardens, and retention basins. Implementation of Alternatives A or B is expected to have minimal impacts on surface water, as the project site would be paved and landscaped, using appropriate BMPs, and no earthmoving activities would be occurring as part of standard operations.

No Action

The No Action Alternative would not generate new sources of surface water pollution and would not affect surface water quality.

3.1.2.2 Groundwater

Affected Environment

The area of concern overlays the Northern Guam Lens Aquifer (NGLA), which was designated as a sole source aquifer in 1978 by the U.S. EPA. This aquifer supplies about 80 percent of the drinking water for Guam's approximately 160,000 residents and nearly 1.4 million visitors. In northern Guam, water is obtained from wells that tap the upper part of a fresh groundwater lens in an aquifer composed mainly of limestone. Mangilao has a well production of approximately 2.2 million gallons per day (MGD), with an available yield of approximately 4.4 MGD (Naval Facilities Engineering Command Pacific, 2015).

The fresh water lens floats on salt water and is separated from the salt water by a transition zone of brackish water. Transition zone thickness depends on the extent of mixing between fresh water and salt water and is generally dozens of feet thick in northern Guam. Mixing in the transition zone results from tidal and pumping fluctuations superimposed on the gravity-driven flow of fresh water toward the shore. Under conditions of steady recharge and no pumping, the lens would have a fixed size. Typically, however, rainfall is episodic and seasonal, and lens volume fluctuates naturally with time. Groundwater discharges continuously throughout the year, and the lens shrinks during dry periods when recharge diminishes or ceases, and expands when recharge increases.

The fresh water aquifers on Guam are susceptible to contamination from surface activities and from saltwater intrusion. The high permeability of the limestone in northern Guam allows rapid infiltration of rainfall and the large pore size in the limestone formations allows contaminants (if present in the surface water) to reach the groundwater table (Naval Facilities Engineering Command Pacific, 2010).

Environmental Consequences

Short-term/Construction

For either Alternative A or B, most construction activities would be conducted above the groundwater table and, therefore, would not affect groundwater resources. However, there would be instances where the installation of structural foundations or utility lines may encounter shallow perched groundwater. Dewatering may be required depending on the installation means and methods. Groundwater removed from excavations would be handled and discharged using BMPs to prevent impacts to groundwater resources. Contamination impacts occur when dewatering is carried out near an existing subsurface pollution source, causing contamination to move toward the dewatering system.

It is unlikely that dewatering would occur in quantities large enough to influence any existing body of groundwater to migrate, should they exist. BMPs will be implemented during construction to prevent stormwater from entering excavations, which have the potential to adversely impact groundwater at the project site. Temporary sediment control BMPs, such as silt fences or sandbag barriers, may be used to prevent off site stormwater runoff from entering excavations at the construction site. Additionally, if excavations are unfilled by the end of each work day, the disturbed areas shall be temporarily covered. With proper installation of these BMPs, no impacts on groundwater quality are anticipated.

Long-term/Operational Use

Operational use of Alternatives A or B would not involve withdrawal, discharge, or use of groundwater resources. For both Alternatives, stormwater would be collected into bioswales along the north, south, and east side of the building or appropriate *low impact development* (LID) measures. The bioswale shall be designed to retain a required amount of runoff and to allow the runoff to percolate into the ground. The bioswales would be designed in accordance with CNMI/Guam Stormwater Management Manual, Chapter 3. As a result, no significant impacts to groundwater resources are anticipated.

No Action

The No Action Alternative would not generate new impacts to groundwater resources.

3.1.3 Soils and Land Use

Affected Environment

Land use in the vicinity of the area of concern is primarily undeveloped land, residential, and the UOG campus along Highway Route 32. Construction activities will include clearing, grubbing, grading, and excavation/trenching.

Guam is constructed of a series of volcanic deposits, upon which limestone has been deposited. The volcanic deposition occurred during the Eocene, Oligocene, and Miocene epochs. The material is primarily andesite with some basaltic flow, and was deposited as tuff, tuff breccia, tuffaceous sandstone and shale, volcanic conglomerate, and basalt flows (U.S. Department of Agriculture, Soil Conservation Service, 1988). Soils on the northern plateau of Guam are generally entisols, consisting of poorly-developed soils without B-

horizons (Young, F.J., 1988). These are typically very shallow soils developed from the erosion of the limestone plateau and the decompositions of organic matter.

The U.S. Department of Agriculture Soil Conservation Service classifies soil at the project site as Guam Soils, Soils of Limestone Uplands. This soil is well-drained, moderately to rapidly permeable soils that are very shallow to limestone bedrock on uplifted plateaus. They are formed in sediment overlying porous coralline limestone with slopes of 0 to 15 percent. Guam soils are red cobbly clay loam throughout. Minor soils in this area are Yijo and Ritidian soils, urban land, and rock outcrop (U.S. Department of Agriculture, Soil Conservation Service, 1988).

Additional soil information for the project site was obtained from the U.S. Department of Agriculture Natural Resources Conservation Service, which classifies the soil as 96 percent Guam cobbly clay loam (3-7% slopes) and 4 percent Guam urban land complex (0-3% slopes). Typically, both Guam cobbly clay loam and urban land complex are composed of cobbly clay loam from 0 to 2 inches, gravelly clay loam from 2 to 8 inches, and bedrock from 8 to 12 inches. The limestone deposits are well drained (U.S. Department of Agriculture, 2017).

Environmental Consequences

Short-term/Construction

Grading/Excavation/Trenching – Alternatives A and B would require grading for the construction of utilities and facilities throughout to achieve suitable finish grades for construction of the cultural repository. Excavation and trenching would also be required for the installation of the structural foundation and utility lines. Excess soil not reused onsite would be stockpiled prior to transfer for reuse or proper disposal off site. The soil stockpile would be secured to prevent erosion or dust hazards, in accordance with applicable regulations and BMPs, including covering of soil stockpiles and utilization of berms to minimize runoff.

As a part of subgrade preparation, all vegetation, organic matter, and other deleterious materials would be removed, as deemed necessary. After stripping and grubbing operations and prior to placement of structural fill, the exposed ground surface should be evaluated by the project Geotechnical Engineer for loose and/or undesirable soil deposits and approved before proceeding with fill placement.

Site grading, excavation, and trenching activities could disturb potentially contaminated soils within the site. Soil management provisions would be adopted to address site construction activities, soil stockpile management, and contaminated soil disposal in relation to cleanup requirements and plans.

Clearing and Grubbing – Alternatives A and B would require clearing and grubbing prior to the start of construction. This may potentially expose soils that are susceptible to erosion during the construction phase. Prior to construction, erosion and sediment control devices would be installed and an Erosion and Sediment Control permit would be obtained from the GEPA. When unvegetated and/or undisturbed, fine-grained soils are disturbed, erosion impacts from exposed soil and soil stockpiles may cause onsite transport of sediment. Construction activities would include employing temporary erosion control measures and

best management practices to mitigate erosion impacts. Where slopes exceed 15%, soils may be stabilized by chemical treatment, geosynthetic stabilization, with a soil mix stabilizer and slope control blankets. or other acceptable measures. A permit for clearing and grading from the Guam Department of Public Works would be required.

Long-term/Operational Use

Stormwater runoff generated on the site after construction would be controlled by bioswales that would reduce the potential for stormwater induced erosion. BMPs would also be implemented to control land-side erosion, sediment input, and stormwater runoff. With proper design, installation and maintenance of the stormwater system and BMPs, significant erosion impacts associated with the operation of Alternatives A or B would not be anticipated.

No Action

The potential for environmental consequences associated with land use and soils conditions under the No Action Alternative are not anticipated.

3.2 Biological Environment

The biological environment includes the biotic or living components of the ecosystem present within the project area. Biotic components include vegetation; special aquatic sites such as wetlands; wildlife; and threatened, endangered, or other special-status species. The affected environment and environmental consequences for each of these components are described below.

A special-status species request was submitted to the U.S. Fish & Wildlife Service (USFWS) on 19 March 2019. The USFWS responded on 12 May 2019. A biological assessment (BA) was conducted for the project area during July – November 2019. The BA included desktop review and field survey to ensure project compliance with Section 7 of the Endangered Species Act (ESA) and local regulations. The field survey used a pedestrian transect method to document flora and to identify any protected species and sensitive habitats in the project area, such as wetlands or host plants of special-status species. The BA was submitted to the USFWS for concurrence with an effect determination of *may affect but is not likely to adversely affect* threatened and endangered species on 05 November 2019. USFWS responded with concurrence, contingent on avoidance and minimization measures, on 12 December 2019.

The Guam Department of Agricultural Division of Aquatic and Wildlife Resources (DAWR) was consulted regarding concerns they may have related to the biological environment on 03 March 2019. DAWR responded on 20 May 2019 and provided a list of protected status species that may occur on or near the project site. DAWR requested consultation with USFWS for endangered and threatened species, critical habitat, native vegetation, and migratory bird species. Additionally, DAWR requested that a ponding basin be included in the facility design to remediate erosion caused by flooding due to inundating rainfall (Appendix A).

3.2.1 Vegetation and Wetlands

Affected Environment

The area of concern is located in the eastern central region of Guam on the northern limestone plateau, which is dominated by the limestone forest, scrub forest and urban built up

or cultivated vegetation types. Guam hosts a diverse flora of over 600 species of vascular plants, including more than 100 tree species. Vegetation on the northern plateau is primarily thick secondary scrub and urban vegetation inland (e.g., lawns and ornamental trees and shrubs), and limestone forests in coastal areas. The field survey confirmed that the dominant vegetation within the eastern portion of the project area is a secondary forest (Leucaena Stand), characterized by a dense thicket of non-native tangantangan with continuous canopy. Non-native shrubs and vines are common, and the overall diversity of native plants was low. Tangantangan is the dominant overstory species with some native noni (*Morinda citrifolia*), and a dense understory of non-native latherleaf (*Colubrina asiatica*) and limeberry (*Triphasia trifolia*). The western portion of the project area has a tall, discontinuous canopy dominated by non-native Spanish cedar (*Cedrela odorata*) with some non-native flame tree (*Delonix regia*) also present. Small understory tangantangan and noni are covered by non-native coral vine (*Antigonon leptopus*), which provides a dense cover over the ground surface and all trees and shrubs on this portion of the project site.

No wetlands or other water features were known to occur in the project area and no areas exhibiting signs of wetland hydrology were observed during the biological survey. The site lacks hydrophytic vegetation and hydric soils (Dewar, 2019). Therefore, no wetlands are present or will be affected by the proposed action at Alternatives A or B.

Environmental Consequences

Short-term/Construction

During construction, to avoid the unintentional introduction of invasive species to Guam, all construction equipment and vehicles arriving from outside of Guam would be washed and inspected prior to entering the project area. Inspection and cleaning activities would be conducted at a designated location.

Final construction of the cultural repository facility would include landscaping. Once construction is complete, the areas with ground disturbance would be revegetated using hydro-seed or similar with a certified weed-free seed, to avoid colonization of invasive species, noxious weeds, or diseased plants.

Long-term/Operational Use

As the project site includes a high volume of invasive plants and vines, and low plant biodiversity, Alternatives A or B would have no adverse impacts to desirable flora. Due to the previous site disturbance and substantial coverage of non-native species, the project site offers little value to native plants. Also, Alternatives A and B do not overlap critical habitat for any listed flora species.

The project design will include a retention basin to remediate erosion and support water infiltration facilitating an environment where native and desirable plant species can thrive.

No Action

Vegetation communities would not be impacted by the implementation of the No Action Alternative because the construction activities associated with the proposed cultural repository project would not occur. Direct/indirect long-term impacts would not occur on vegetation with the implementation of the No Action Alternative, with the exception of a

potential increase in invasive species and subsequent decrease in the little remaining native species present onsite.

3.2.2 Wildlife

Affected Environment

Species with the potential to exist at the project site include insects and spiders; reptiles such as skinks, anoles, Monitor lizards, and geckos; the endangered Mariana Crow (*Corvus kubaryi*) and other local and migratory bird species; tree and land snails (including the invasive Giant African Snail); rats and shrew species; toads and frogs; the endangered Mariana Fruit Bat (*Pteropus mariannus*); and the invasive brown tree snake (which is targeted for eradication).

Environmental Consequences

Short-term/Construction

Alternatives A and B could potentially impact wildlife residing on or near the project site due to the use of active construction equipment, and soil movement necessary to clear the project site and construct the cultural repository. Disturbances, noise, dust, and vegetation removal could negatively impact local species that live or forage in the vicinity. The following best management practices will be employed to reduce impacts to wildlife:

1. Dust control measures must be employed during the construction activities. It is the contractor's responsibility to monitor the effectiveness of the dust control apparatus;
2. Heavy machinery use must be closely monitored for any fuel or hazardous chemical leakage;
3. Absorbent pads must be readily available at the project site at all times;
4. Silt curtains must be employed in areas where stormwater drains occur;
5. In the presence of protected species, activity must be stopped until the species leaves the area of its own volition.

Long-term/Operational Use

No long-term impacts are anticipated associated with the operational use of the cultural repository facility. Most species with the potential to be present at the site are opportunistic, and would find the opportunity to forage or roost elsewhere in the surrounding area.

No Action

Under the No Action Alternative, wildlife communities in the project area would not be directly or indirectly affected in the short-term because construction would not occur.

3.2.3 Threatened and Endangered Species

Affected Environment

There are currently 33 species of plants and animals listed as endangered and threatened by the USFWS and the National Oceanic and Atmospheric Administration – National Marine Fisheries Service (NMFS) in the territory of Guam. The listed species include two species of

the Mariana fruit bat, two species of Mariana butterflies, the Mariana crow, the Guam kingfisher, the Guam rail, the Micronesian megapode (mound-builder), the Mariana moorhen, three species of tree snails, the Mariana swiftlet, the nightingale reed warbler, the Guam bridled white-eye, three species of sea turtles, Slevin's skink, and 15 plant species (U.S. Fish and Wildlife Service, 2019). A list of special-status species (Federally Threatened and Endangered, or State Threatened or Endangered), which may occur within the area of concern, was received from the USFWS for this EA on 12 May 2019.

The USFWS indicated that they reviewed the project description pursuant to the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.). The USFWS determined that the federally threatened Mariana fruit bat (*Pteropus mariannus mariannus*) may occur within or pass through the project site. Federally endangered tree snails such as the humped tree snail (*Partula gibba*), Guam tree snail (*Partula radiolata*), and fragile tree snail (*Samoana fragilis*) may also occur. The federally endangered Marianas eight-spot butterfly (*Hypolimnas octocula marianensis*) may be present and can be found on the two local forest herbs, *Procris pedunculata* (no common name [NCN]) and tapun ayuyu (*Elatostema calcareum*) may occur at the proposed Alternatives A and B. Additionally, the federally threatened Fadang (*Cycas micronesica*), the federally threatened epiphytic orchids siboyas halumtanu (*Bulbophyllum guamense*), *Dendrobium guamense* (NCN), and *Tuberolabium guamense* (NCN), and the federally endangered ground orchid *Nervilia jacksoniae* (NCN) may also occur at or near the proposed sites. However, the USFWS made an overall determination that no designated critical habitat exists within or near the project site.

A BA was conducted during July – November 2019 and considered direct, indirect, and cumulative effects on the list of threatened, endangered, and candidate species provided by the USFWS, in addition to those locally occurring species protected under the Migratory Bird Treaty Act (MBTA), and Guam listed species. Thirty-four species were evaluated in detail in the BA. The BA was submitted to the USFWS for concurrence with an effect determination of *may affect but is not likely to adversely affect* threatened and endangered species on 05 November 2019. USFWS responded with concurrence, contingent on avoidance and minimization measures, on 12 December 2019.

Environmental Consequences

No ESA, MBTA, or Guam-listed species were observed in the project area. No critical habitat or wetlands occur in the project area. Direct effects are not anticipated to any listed species or their habitat, though in some cases presence cannot be entirely ruled out. The following conservation measures are required to avoid and minimize impacts to listed species.

Short-Term/Construction

- Prior to working on the project, all project personnel will attend a preconstruction environmental training to review potential special-status species that could be found in the project area and ensure that conservation measures for the project are understood and implemented. The training should include a description of the species and their habitat needs; a report of the occurrence of the species in the project area; an explanation of the status of the taxa and its protection under ESA, MBTA, or Guam regulations; a list of measures being taken to reduce impacts to the species during construction; and responsibilities of employees. A fact sheet conveying this information should be prepared for all personnel associated with the project and for anyone else who may enter

the site. On completion of training, employees will sign a form stating that they attended the training and understand all the conservation measures.

- To avoid disturbance of Mariana fruit bats, construction work will temporarily cease if a Mariana fruit bat maternal colony occurs within 820 feet of the project or of a Mariana fruit bat occurs 656 feet downwind (or 492 feet in any other direction) from the construction activity.

- To minimize the potential for a tree snail to be affected by the construction activity, the project site will be surveyed for tree snails using the *USFWS Draft Interim Guidelines for Conducting Tree Snail Surveys in the Mariana Islands*, dated 18 August 2019, and, if a tree snail is detected, no vegetation removal or earthmoving activity will occur within a work exclusion buffer zone around the tree snail.

- All heavy equipment, vehicles, and construction activities will be confined to the designated project area. The activity footprint and vegetation removal will be minimized as feasible to reduce the potential for impacts to special-status species.

- Vehicle speeds on unpaved roads will not exceed 15 miles per hour.

- Trash dumping, firearms, open fires (e.g., barbecues), hunting, and pets will be prohibited at the work site. All trash and waste items generated by construction or crew activities will be properly contained and removed from the project area.

- All project personnel will visually check for animals beneath vehicles and equipment immediately prior to operation.

- The potential for wildlife to seek refuge or shelter in pipes and culverts will be minimized. Any pipes, culverts, or other open-ended materials and equipment stored onsite will be inspected for animals prior to moving, burying, or capping to assure that no animals are present within the materials and equipment. To prevent accidental entrapment of wildlife during construction, all excavated holes, ditches, or trenches greater than 1 foot deep will be covered at the end of each workday by suitable materials or escape routes will be constructed. After opening and before filling, such holes, ditches, and trenches will be thoroughly inspected for trapped animals.

- If a special-status species is discovered in the project area, the Project Manager (PM) will be contacted. The PM will report the sighting to the USFWS (and DAWR) within 24 hours. The animal will be allowed to move off site on its own. Special-status species will not be taken or harassed.

- Soil will be stockpiled within established work area boundaries and located so as not to enter water bodies, stormwater inlets, or other standing bodies of water. Stockpiled soil will be covered during rainfall events and at the end of each work day.

- Products used for stormwater BMPs (if used) with net-like materials (e.g., jute mats, fiber logs, etc.) will be composed of 100% natural material and inspected prior to and after each storm event to ensure they are properly secured to prevent injury to listed species. All perimeter control products must be removed and disposed of properly at the completion of construction and site stabilization.

- All construction equipment will be well maintained to prevent leaks of fuels, lubricants, or other fluids in accordance with the operator's manual and manufacturer's recommendations. All equipment shall be inspected for leaks before being mobilized onsite and daily while onsite.

- Any stationary equipment containing lubricating oils and fuel (e.g., portable compressor, hydraulic pump, cranes, generators, etc.) will be placed within secondary containment.

- A copy of all applicable permits and approvals, with associated maps, conditions, and conservation measures will be kept onsite at all times.

- A qualified biologist will survey the work area no more than 10 days prior to the start of initial vegetation removal and ground disturbing activities. When a sensitive species is identified, data will be collected to its identity, location, population size, and population condition. Photos and GPS data will be collected using a hand-held GPS device. The information collected will be reported to the PM and USFWS (and DAWR) to evaluate project activities and, if deemed necessary, modify activities to provide adequate resource protection. The survey will consist of walking the project limits and within the project site to ascertain the possible presence of listed species. The qualified biologist will investigate all potential areas that would be used by listed species.

- If listed species are encountered during project construction, all activities which have the potential to result in the harassment, injury, or death of the individual will be immediately halted, and the qualified biologist will be contacted for further direction. To the maximum extent possible, contact with the species will be avoided and it will be allowed to move out of the potentially hazardous situation to a secure location on its own volition. If the species cannot leave the project area on its own, the PM and qualified biologist will contact the USFWS (and DAWR) for further guidance.

- The qualified biologist will flag any sensitive natural resources identified within the project area to minimize the risk of unintended disturbance. If active bird nests are found, the qualified biologist will notify the PM who will consult with the appropriate resource agency to determine appropriate avoidance buffers; biological monitoring may be needed depending on buffer distances and associated project activities. If special-status plant species are incidentally observed in the project area, individuals will be marked with flagging or construction fencing and avoided during construction activities. Depending on the species, buffer zones around the plants may be established to avoid effects on special-status plants. If special-status plants are observed, environmental training for construction personnel will include identification and location of special-status plants.

- Uniquely-colored tapes will be used for flagging sensitive resources and for marking the boundaries of ecologically sensitive areas such as bird nest buffers. All personnel entering the work sites will be asked to stay out of the flagged environmentally sensitive areas while conducting field activities.

Long-term/Operational Use

Operation of the cultural repository facility will be consistent with land use in the surrounding area. No impacts to threatened or endangered species are anticipated from the

operational use of the facility. The finished facility will be seeded and landscaped with non-invasive species, and as part of the University of Guam, will be maintained invasive species free.

No Action

Under the No Action Alternative endangered and threatened species, species of concern, and sensitive species would not be directly affected in the project area because construction associated with the proposed action would not occur. Direct/indirect long-term impacts would not occur to threatened and endangered species and their habitats by the implementation of the No Action Alternative.

3.3 Cultural Resources

Affected Environment

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. They include archaeological resources (both prehistoric and historic), historic architectural resources, and traditional cultural resources. Only significant cultural resources (as defined in 36 CFR 60.4) are considered for potential adverse impacts from an action. Significant archaeological and architectural resources are either eligible for listing, or listed on, the NRHP. Significant traditional cultural resources are identified by indigenous groups or nongovernmental groups, and may also be eligible for the NRHP.

According to the *Revised Draft—Phase 1 Archaeological Inventory Survey for the University of Guam Cultural Repository Facility Project, Lot 5372-3A, Maga, Mangilao Municipality, Guam (RC2011-0782),* the summary of the background of the project area and surrounding areas is as follows (Garcia and Associates, Inc., 2019):

> Background research indicates an extensive history of former land use in the general vicinity of the undertaking area of potential effect (APE), although perhaps not extensively within the APE itself. Permanent occupation appears in the region during the Latte Period, where coastal settlements along Pago Bay and on the limestone plateau west and northwest of the APE appeared to thrive (GHPI 66-04-0027, 66-01-0148, and 66-01-0222). Spanish settlement increased in Pago Bay, as a Spanish mission parish and subsequent Reducción village was established there in the seventeenth century. Pago was the third largest village on the island, after Hagåtña and Merizo, by the early 1800s, indicating travel likely occurred in and out of the bay and that settlement and associated farming and ranching likely extended onto the limestone hills behind the bay. Governor Price's "back to soil" campaign in the 1920s increased farming in the area. Copra plantations and a trail are evident within the APE by the 1940s.
>
> World War II and immediate Post-World War II U.S. military installations were erected in the APE vicinity, including the 6th Marine Corps Headquarters. Historical aerial imagery indicates the APE experienced some level of land clearance during this period, particularly in the southern portion of the APE where several Quonset huts were erected.

Due to the likelihood of previous disturbance in the area, it is likely only re-deposited pre-Contact to immediate pre-war resources will be encountered, which would be void of their original context. There is a higher potential for encountering historic military infrastructure or isolated material associated with World War II to Post-World War II U.S. military activity. Resource types were expected to include remnant concrete foundations, military paraphernalia, and historic glass beverage bottles. Concrete foundations were especially likely considering the presence of Quonset hut facilities on U.S. Navy aerial imagery from the period and apparent abandonment of the parcel in the interim decades, indicating the remnants of these facilities may still exist.

Environmental Consequences

Consultation with the Guam SHPO concluded on 04 March 2020 and resulted in a finding of no adverse effect determination to Guam Historic Properties Inventory (GHPI) Site number 66-01-2973 and other historic properties that may be found in the course of the undertaking within the APE outlined in the following stipulations:

- No work from this project is permitted to occur outside of the APE for this project, as documented on project plans. Contractor laydown areas must be included in the APE, or may be situated on a UOG property that has been previously cleared. Land within the lot, but outside of the APE boundary, has not been surveyed for archaeological resources and cannot be cleared for construction under this project.

- The Contractor is required to hire the services of an archaeologist who meets the Secretary of the Interior's Professional Qualifications Standards for Archaeology and is listed on the Guam Historic Preservation Division's list of qualified archaeological firms. A Certificate of Approval will be issued to the Contractor to hire an archaeologist before the permitting process.

- The SHPO requires an Archaeological Monitoring and Discovery Plan (AMDP), for ground disturbance within the APE. Draft and final archaeological monitoring reports are required and will require SHPO review and approval. SHPO review time is 30 calendar days. The SHPO will issue a letter of acceptance for an approved final report. All Guam SHPO Reporting Guidelines must be followed. The Contractor will be responsible for all deliverables to the SHPO in accordance with the Guam Reporting Guidelines for Archaeological Surveys and is responsible for the archaeologist following the Guam Reporting Guidelines.

- The APE contains at least one known site (GHPI 66-01-2973), as documented on project plans, that will need to be uncovered, mapped out and assessed for significance by the archaeologist. In order to do this, the entire site will be uncovered and mapped out before the assessment can be made.

- A Secretary of the Interior qualified archaeologist must be onsite during initial clearing, grubbing, and grading to monitor disturbance for archaeological resources. Other sites may be found during the course of the clearing of the lot and the entire APE must to be monitored for historic properties. Vegetation associated with a home is also located within the property, therefore, this area needs to be closely monitored for features. Data

recovery and mitigation may be required and will be addressed to complete the undertaking.

- In the event of discoveries of archaeological, historical, or cultural resources during excavation, construction work at the site of the discovery shall cease and the Contractor shall notify the Project Engineer. The Project Engineer shall notify Guam SHPO as soon as practical.

- Construction work away from the discovery site may continue. Construction work at the discovery site shall not recommence until the Guam SHPO issues clearance to continue excavation. The Contractor must coordinate with the archaeologist to secure the area and prevent employees or other persons from trespassing on, removing, or otherwise disturbing such resources.

- The Contractor and/or Subcontractor shall not claim monetary compensation for any delay of work as a result of any unforeseen archaeological site discovered during construction. Time extensions may be granted to the Contractor for such delays resulting from discovery of historic resources in the project, so long as the delay adversely affects the critical path and the delay is in excess of three days.

- The assessment of the site will need to be presented to the SHPO for concurrence and any non-concurrence will be mitigated through data recovery and other type of mitigation in consultation with the SHPO. Avoidance of archaeological and historical resources is preferred.

- If there are any findings, the SHPO and State Archaeologist will be notified within 24 hours and the archaeologist will direct the clearing as to not damage the site during clearing. A 20-meter buffer zone will be placed around the known site and any new site until such time as it has been assessed and concurred upon by the SHPO in writing.

No Action

No construction activities, with the potential to disturb surface/subsurface cultural resources, would occur in the No Action Alternative. As a result, cultural resources would not be affected by the selection of the No Action Alternative.

3.4 Hazardous and Solid Waste

Affected Environment

Hazardous materials include medical and industrial wastes, pesticides, herbicides, radioactive materials, combustible fuels, and biohazardous material (i.e., biological material capable of causing disease in humans). Improper use, storage, transport, or disposal of these materials may result in harm to humans, surface or groundwater degradation, air pollution, fire, or explosion.

In an effort to understand the existing conditions at the project site, a Phase I Environmental Site Assessment was conducted (Appendix D). The purpose of a Phase I Environmental Site Assessment was to identify *recognized environmental conditions*, which indicate the potential for a release of hazardous substances and petroleum products, or a material threat of release.

Three *recognized environmental conditions* were identified in connection with the project site. An illegal dump area was found on the southwestern portion of Alternative A and the southeastern portion of Alternative B. Two abandoned vehicles, appliances, and municipal solid waste were observed in this area. The abandoned vehicles likely contain residual petroleum products. One pole-mounted transformer was observed to the south of Alternative A and showed visible staining. A second stained pole-mounted transformer was observed approximately 500 feet north of Alternative A. It is unknown if the transformers contain polychlorinated biphenyls (PCB).

The Alternatives A and B were previously occupied by the U.S. Department of Defense during 1948-1953, which may have resulted in willful or accidental release or burial of hazardous substances/materials and/or petroleum products. The occupancy by the Department of Defense and the undocumented activities which may have occurred, could lead to a *recognized environmental condition*.

Environmental Consequences

Short-Term/Construction

Under Alternatives A and B, the illegal dump area would be remediated prior to construction. Abandoned vehicles, appliances, and municipal solid wastes would be removed from the project site and properly disposed of at a permitted landfill. If visibly contaminated soils are encountered, they would be excavated from the project site and properly disposed of.

The use of petroleum products would be necessary for Alternatives A or B during the construction phase. Vehicles and heavy machinery would require petroleum products for fuel needs and maintenance. Any onsite fueling and/or maintenance would be conducted using approved standard operating procedures to minimize the potential for releases. A spill kit is required to be onsite in case of any accidental releases. In the event of a release, the material would be immediately cleaned up using the spill kit. The release would be reported to the appropriate agency, if warranted. No hazardous wastes are anticipated to be generated during the construction phase.

Green waste would be generated with the Alternatives A or B. Any green waste generated would be taken to the appropriate green waste facility to prevent the spread of little fire ants and Coconut Rhinoceros Beetles. Green waste disposal sites in Guam include Primo's Northern Hardfill in Yigo and Pacific Soils and Compost.

Long-term/Operational Use

Under Alternatives A and B, an outdoor and indoor fuel tank would be installed for the power for two emergency generators. The fuel tanks would comply with all federal, state, and local laws and regulations.

No Action

Construction activities that have the potential to disturb surface/subsurface soils and the potential occurrence of hazardous materials would not occur with the implementation of the No Action Alternative (Alternative C). As a result, any hazardous materials that may be present would not be affected by the selection of the No Action Alternative.

3.5 Energy and Natural Resources

Affected Environment

UOG purchases electricity from Guam Power Authority (GPA). Electrical distribution for Alternatives A and B includes the existing GPA power distribution system. The power supplied to the UOG Repository Facility will come from the GPA generation system. The average demand for the facility is anticipated to be approximately 500 kilowatts.

Power to the facility would be connected to an existing 13.8 kilovolts (kV) overhead feeder near the property. A new concrete encased underground feeder would be required to the new pad-mounted transformer via a new primary riser installed on the existing utility power pole. The secondary service to the facility would be routed underground from the pad-mounted transformer to the electrical service equipment installed in the electrical room.

Two generators would be required for the facility. The first generator would provide 100% back-up power, while the second generator would provide power to critical loads only. The two generators would be connected such that the second generator would only be energized when the first generator fails to operate. Each generator would have an outdoor fuel tank and an indoor fuel day tank.

The generators shall meet EPA's air emission requirements regulated by the Clean Air Act. A Standby Generator Permit and Construction and Operating Permit from GEPA would be required since the capacity is greater than permit requirement, 65 kilowatts (85 HP).

The project would reduce use of fossil fuel-derived energy through energy-efficient light-emitting diode (LED) light fixtures.

Environmental Consequences

Alternatives A and B would not create an excessive energy demand or impact to the GPA power systems. Alternatives A and B would have some minor, temporary usage of energy for portable generators to provide emergency power. The consumption of energy and resources would be minor compared to the overall load on the GPA power system, and diesel generators would be used, which would not impact electrical grid demand. As a result, none of the Alternatives are expected to impose significant impacts on energy supplies or natural resources. Under the No Action Alternative, the site would remain vacant with no increase in energy consumption.

3.6 Noise

Affected Environment

Under the Alternatives A or B, short-term noise impacts would occur from construction activities. Development of the project site would involve excavation, grading, and other typical construction activities. BMPs (e.g., construction scheduling; insulation/muffling; reduced power options; equipment selection, substitution, retrofit, and maintenance; utilization of staging areas; and nonpermanent noise barriers) would be implemented to reduce or eliminate noise.

Upon completion, the Proposed Alternative would have less than significant long-term impacts to noise receptors, UOG faculty, students, and nearby residents. The proposed facility development is expected to incorporate stationary mechanical equipment but are not limited to, air handling equipment, condensing units, and refrigeration units.

Environmental Consequences

None of the alternatives would be expected to impose significant long-term noise impacts on the project area. Background noise levels may be elevated during construction activities associated with Alternatives A or B. Construction noises tend to be short in duration and concentrated around the immediate work area. Construction-related noise will be mitigated through the use of standard procedures such as specific, implementation of BMPs and the use of mufflers on construction equipment. Under the No Action Alternative, the site would remain vacant and there would be no change to noise levels.

3.7 Public Health and Safety

Affected Environment

Environmental Risk Information Services (ERIS) identified one Large Quantity Generator (LQG) and one Underground Storage Tank (UST) site within 1/4 mile of the project site. The LQG and UST site are both located at the UOG Station, approximately 120 feet upgradient, east southeast of the project site. Although in close proximity to the project site, there are no reported releases from the UOG Station and as a result, there is little potential that soil contamination resulting from the LQG and/or UST site have impacted the project site which may affect public health and safety. No other sites with the potential to impact the project site were identified in the ERIS report.

During the Phase I Environmental Site Assessment, a dump area was identified on the southern portion of the project site, at the end of Atbut Lane. The dump area consisted of municipal waste and no hazardous wastes or petroleum products were identified. An abandoned refrigerator and two vehicles were also identified near this area, with one of the abandoned vehicles within the project site boundary.

Public health and safety may also be compromised in the form of insufficient fire protection, wastewater utilities, ADA compliance, or construction without proper environmental controls.

Environmental Consequences

Short-term/Construction

Short-term/temporary (construction) public health and safety impacts for Alternatives A or B would be related to general construction hazards. A Work Plan and Health and Safety Plan (HASP) would be prepared and implemented that articulates appropriate hazard controls and personnel and environmental protections to minimize the potential for exposure (e.g. dust control). The HASP should also include air monitoring to ensure worker respiratory protection. Excavated soil shall be evaluated for contaminants, and if the levels exceed regulatory levels, appropriate hazard control and soil management must take place. Excavated soil that is temporarily stockpiled must be bermed and covered to prevent the release of potentially contaminated soil through air or stormwater runoff. With the hazard

control requirements and appropriate construction management, there would be little to no impact to public health and safety. The dumped waste and vehicles should be removed prior to construction activities to eliminate any threats to public health and safety.

Long-term/Operational

There are no long-term (operational) public health and safety impacts anticipated from Alternatives A or B. The building would meet the most current ADA Standards for Accessible Design and fire service utilities would service the building in accordance with Guam Waterworks Authority (GWA) requirements. Wastewater utilities would service the building and would be installed in accordance with GWA requirements. The parking layout design would meet the most current ADA Standards for Accessible Design; the most current GCA, Title 21, Chapter 61; and the driveway access design would meet requirements in the GCA, Chapter 73 and the 2009 International Fire Code.

No Action

The No Action Alternative could cause moderate impacts to public health and safety, in the event that the dumped waste and abandoned vehicles remain or accumulate at the project site and nearby properties. The vehicles may contain petroleum products that have the potential to impact public health and safety if they are tampered with. If the illegal dumping continues, there would be increasing long-term public health and safety impacts anticipated from the No Action Alternative.

3.8 Population and Economics

Affected Environment

Socio-economics is defined as the basic attributes and resources associated with the human environment, particularly population and economic activity. Human population is affected by regional birth and death rates as well as net in- or out-migration. Guam is a small isolated island territory, positioned in a location of strategic military importance and in a climate favorable for tourism. Population change depends on three components: fertility, mortality, and net migration.

The United States Department of Defense and other federal expenditures are the main drivers of Guam's economy, followed by territorial spending, tourism, and private sector construction. Despite slow growth, the Guam economy has been stable. From 2002 to 2013, the real gross domestic product experienced an average annual growth rate of 1.4 percent.

Environmental Consequences

Under Alternatives A or B, the number of temporary jobs that the project would generate would be moderate for construction of the new facility. Therefore, it is expected that there would be short-term direct/indirect socio-economic impact in the region with the implementation of Alternative A or B, such as increased housing demand in the region. Beyond this, there would be no socio-economic impacts associated with construction for this project.

It is expected that the long-term socio-economic impacts of the project would be relatively low, as the increase of jobs would be minimal. It is unlikely that Alternatives A or B would

result in relocations or influx of workers from outside of Guam and as a result, demand for housing is not expected to change due to the relatively small number of jobs created over approximately one year, and the housing vacancy rate should not be affected. Long-term direct/indirect impacts on housing in the region are not expected to be significant.

With the No Action Alternative, there will be no impact on local employment in the area of concern.

3.9 Environmental Justice

Affected Environment

Environmental justice is 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. This can be achieved with everyone having the same degree of protection from environmental and health hazards, and equal access to the decision-making process to have a healthy environment in which to live, learn, and work. Fair treatment means that no group of people should bear a disproportionate share of the negative environmental consequences resulting from industrial, governmental, and commercial operations or policies. The U.S. EPA defines meaningful involvement as: 1) people have an opportunity to participate in decisions about activities that may affect their environment and/or health; 2) the public's contribution can influence the regulatory agencies decisions; 3) community concerns will be considered in the decision making process; and 4) decision-makers will seek out and facilitate the involvement of those potentially affected (U.S. Environmental Protection Agency, 2019). The environmental effects, including human health, economic, and social effects on minority populations, low-income populations, and indigenous groups, must be analyzed under NEPA (Council on Environmental Quality, 1997).

The concept of race as used by the Census Bureau reflects self-identification and self-classification by people according to the race with which they most closely identify with (U.S. Census Bureau, 2010). Minorities are individuals who are members of the following population groups: American Indian or Alaskan Native; Asian or Pacific Islander; Black, not of Hispanic origin; or Hispanic. Low-income populations in the affected area should be identified with the annual statistical poverty thresholds from the Bureaus of the Census' Current Population Reports, Series P-60 on Income and Poverty (Council on Environmental Quality, 1997). The percentage of impoverished people in the affected area is compared with the percentage of people living below the poverty limit in the general population to determine if a significant difference exists. Minority and impoverished population totals and percentages estimated from 2010 U.S. Census data are presented in Table 12 (U.S. Census Bureau, 2010).

Table 1. Minority and Impoverished Population Totals and Percentages for Mangilao Municipality and the Territory of Guam

	Mangilao	Guam
Total Population	15,191 (100%)	159,358 (100%)
Native Hawaiian or other Pacific Islander	8,974 (59.1%)	78,582 (49.3%)
Asian or Pacific Islander	3,652 (24.0%)	51,381 (32.2%)
White	781 (5.1%)	11,321 (7.1%)
Black	130 (0.9%)	1,540 (1.0%)
Hispanic or Latino	72 (0.5%)	1,210 (0.8%)
Other Ethnic Race of Origin	25 (0.2%)	404 (0.3%)
Two or more ethnic origins or races	1,557 (10.2%)	14,929 (9.4%)
Percentage with income below poverty level *	3,596 (23.7%)	25, 848 (22.5%)

SOURCES: Guam Bureau of Statistics and Plans, Office of the Governor, 2013
Guam State Data Center, 2012
U.S. Census Bureau, 2010

The Mangilao municipality populations are comprised of a slightly higher percentage of impoverished populations than the territory of Guam as a whole. Table 12 shows that 24% of the Mangilao population lives below the poverty level, compared with 23% on the entire island of Guam.

Environmental Consequences

Alternative A and B and the No Action Alternative would have no environmental justice impact on minorities and low-income persons as the project area is not in an area with a greater percentage of minorities or impoverished people, when compared to the Island of Guam overall.

3.10 Cumulative Effects

Cumulative impacts result when an incremental impact associated with an action is considered additively with impact of past, present, and reasonably foreseeable actions, regardless of what agency or person undertakes such other actions (40 CFR 1508.7). Cumulative impacts may result from individually minor but collectively significant actions that occur within the same temporal and spatial context.

The alternative project sites for the proposed cultural repository are located within the University of Guam Vision 2025 Master Plan, a planning document originally initiated in 1987 to ensure sustainable smart growth of the Mangilao campus. Therefore, the proposed cultural repository facility project in combination with other UOG development projects would not result in negative cumulative impacts, as the campus has been carefully planned to minimize impacts to the natural and human environment.

The development associated with the Guam Military Build-Up Final and Supplemental Environmental Impact Statements, including projects such as the Live Fire Training Range Complex, will precipitate an increase in archaeological objects discovered as the scheduled construction continues. Additionally, the Guam and CNMI Divert Activities and Exercises project will precipitate increased development on Guam. Therefore, increased storage capacity is essential to ensure that adequate storage space providing conservation-minded protections is available to meet both current and future demands. The proposed cultural repository facility

would help to minimize negative cumulative impacts associated with insufficient storage space for discovered archaeological items for many military development projects.

4.0 FINDINGS AND CONCLUSION

The NEPA guidance suggests that the evaluation of an action alternative should include consideration of means to reduce or mitigate, adverse environmental impacts. Mitigation measures are identified to ensure that an action does not create any significant adverse effects.

4.1 Potential Adverse Impacts and Mitigation Measures

Potential negative or adverse effects associated with the preferred action would be minimized through the implementation of appropriate practices and technologies during construction and operation of the facility. Construction activities would be conducted in a manner that would limit potential environmental impacts to water and soil resources. Generation of dust and particulate emissions would be minimized using appropriate and accepted methods. Construction traffic would be minimal, and controlled access to the construction site would reduce the potential for adverse effects to transportation. Construction activities would be limited to normal weekday work hours to minimize the potential effects to local residents with construction noise. The illegal dump of municipal waste identified at the project site would be removed prior to construction, alleviating the potential for trash disturbance and/or dispersal during construction.

Consultation and coordination with SHPO, USFWS, and DAWR was completed to ensure appropriate mitigation measures were developed and implemented to limit impacts to vegetation, wildlife, special-status species, and cultural/archaeological resources. Environmental permits and associated planning documents through GEPA and other local agencies sought for construction would ensure that discharges to air, water, and soil are within acceptable local standards to protect human health and the environment.

Consultation with SHPO under NHPA Section 106 resulted in a finding of *no adverse effect* determination to Guam Historic Properties Inventory (GHPI) Site number 66-01-2973 and other historic properties that may be found in the course of the undertaking within the APE outlined in the following stipulations:

- No work from this project is permitted to occur outside of the APE for this project, as documented on project plans. Contractor laydown areas must be included in the APE, or may be situated on a UOG property that has been previously cleared. Land within the lot, but outside of the APE boundary, has not been surveyed for archaeological resources and cannot be cleared for construction under this project.

- The Contractor is required to hire the services of an archaeologist who meets the Secretary of the Interior's Professional Qualifications Standards for Archaeology and is listed on the Guam Historic Preservation Division's list of qualified archaeological firms. A Certificate of Approval will be issued to the Contractor to hire an archaeologist before the permitting process.

- The SHPO requires an Archaeological Monitoring and Discovery Plan (AMDP), for ground disturbance within the APE. Draft and final archaeological monitoring reports are required and will require SHPO review and approval. SHPO review time is 30

calendar days. The SHPO will issue a letter of acceptance for an approved final report. All Guam SHPO Reporting Guidelines must be followed. The Contractor will be responsible for all deliverables to the SHPO in accordance with the Guam Reporting Guidelines for Archaeological Surveys and is responsible for the archaeologist following the Guam Reporting Guidelines.

- The APE contains at least one known site (GHPI 66-01-2973), as documented on project plans, that will need to be uncovered, mapped out, and assessed for significance by the archaeologist. In order to do this, the entire site will be uncovered and mapped out before the assessment can be made.

- A Secretary of the Interior qualified archaeologist must be onsite during initial clearing, grubbing, and grading to monitor disturbance for archaeological resources. Other sites may be found during the course of the clearing of the lot and the entire APE must to be monitored for historic properties. Vegetation associated with a home is also located within the property, therefore, this area needs to be closely monitored for features. Data recovery and mitigation may be required and will be addressed to complete the undertaking.

- In the event of discoveries of archaeological, historical, or cultural resources during excavation, construction work at the site of the discovery shall cease and the Contractor shall notify the Project Engineer. The Project Engineer shall notify Guam SHPO as soon as practical.

- Construction work away from the discovery site may continue. Construction work at the discovery site shall not recommence until the Guam SHPO issues clearance to continue excavation. The Contractor must coordinate with the archaeologist to secure the area and prevent employees or other persons from trespassing on, removing, or otherwise disturbing such resources.

- The Contractor and/or Subcontractor shall not claim monetary compensation for any delay of work as a result of any unforeseen archaeological site discovered during construction. Time extensions may be granted to the Contractor for such delays resulting from discovery of historic resources in the project, so long as the delay adversely affects the critical path and the delay is in excess of three days.

- The assessment of the site will need to be presented to the SHPO for concurrence and any non-concurrence will be mitigated through data recovery and other type of mitigation in consultation with the SHPO. Avoidance of archaeological and historical resources is preferred.

- If there are any findings the SHPO and State Archaeologist will be notified within 24 hours and the archaeologist will direct the clearing as to not damage the site during clearing. A 20-meter buffer zone will be placed around the known site and any new site until such time as it has been assessed and concurred upon by the SHPO in writing.

Consultation with DAWR resulted in mitigation as follows:

- In the event of discoveries of special-status species during construction, the construction manager will be contacted. The construction manager will report the sighting to the

DAWR (and USFWS) within 24 hours. The animal will be allowed to move off site on its own. Special-status species will not be taken or harassed.

Consultation with USFWS under ESA Section 7 resulted in USFWS concurrence with a finding that the construction and operation of the cultural repository facility *may affect, but is not likely to adversely affect* three listed species, the Mariana fruit bat, Slevin's skink, and three tree snail species (humped tree snail, Guam tree snail, and Fragile tree snail) due to the following mitigation measures:

- Prior to working on the project, all project personnel will attend a preconstruction environmental training to review potential special-status species that may potentially be found in the project area and ensure that conservation measures for the project are understood and implemented. The training should include a description of the species and their habitat needs; a report of the occurrence of the species in the project area; an explanation of the status of the taxa and its protection under ESA, MBTA, or Guam regulations; a list of measures being taken to reduce impacts to the species during construction; and responsibilities of employees. A fact sheet conveying this information should be prepared for all personnel associated with the project and for anyone else who may enter the site. On completion of training, employees will sign a form stating that they attended the training and understand all the conservation measures.

- To avoid disturbance of Mariana fruit bats, construction work will temporarily cease if a Mariana fruit bat maternal colony occurs within 820 feet of the project or of a Mariana fruit bat occurs 656 feet downwind (or 492 feet in any other direction) from the construction activity.

- To minimize the potential for a tree snail to be affected by the construction activity, the project site will be surveyed for tree snails using the *USFWS Draft Interim Guidelines for Conducting Tree Snail Surveys in the Mariana Islands*, dated 18 August 2019, and, if a tree snail is detected, no vegetation removal or earthmoving activity will occur within a work exclusion buffer zone around the tree snail.

- All heavy equipment, vehicles, and construction activities will be confined to the designated project area. The activity footprint and vegetation removal will be minimized as feasible to reduce the potential for impacts to special-status species.

- Vehicle speeds on unpaved roads will not exceed 15 miles per hour.

- Trash dumping, firearms, open fires (e.g., barbecues), hunting, and pets will be prohibited at the work site. All trash and waste items generated by construction or crew activities will be properly contained and removed from the project area.

- All project personnel will visually check for animals beneath vehicles and equipment immediately prior to operation.

- The potential for wildlife to seek refuge or shelter in pipes and culverts will be minimized. Any pipes, culverts, or other open-ended materials and equipment stored onsite will be inspected for animals prior to moving, burying, or capping to assure that no animals are present within the materials and equipment. To prevent accidental entrapment of wildlife during construction, all excavated holes, ditches, or trenches

greater than one-foot deep will be covered at the end of each workday by suitable materials or escape routes will be constructed. After opening and before filling, such holes, ditches, and trenches will be thoroughly inspected for trapped animals.

- If a special-status species is discovered in the project area, the construction manager will be contacted. The PM will report the sighting to the USFWS (and DAWR) within 24 hours. The animal will be allowed to move off site on its own. Special-status species will not be taken or harassed.

- Soil will be stockpiled within established work area boundaries and located so as not to enter water bodies, stormwater inlets, or other standing bodies of water. Stockpiled soil will be covered during rain events and at the end of each work day.

- Products used for stormwater BMPs (if used) with net-like materials (e.g., jute mats, fiber logs, etc.) will be composed of 100% natural material and inspected prior to and after each storm event to ensure they are properly secured to prevent injury to listed species. All perimeter control products must be removed and disposed of properly at the completion of construction and site stabilization.

- All construction equipment will be well maintained to prevent leaks of fuels, lubricants, or other fluids in accordance with operator's manual and manufacturer's recommendations. All equipment shall be inspected for leaks before mobilization to the project site, daily while onsite.

- Any stationary equipment containing lubricating oils and fuel (e.g., portable compressor, hydraulic pump, cranes, generators, etc.) will be placed within secondary containment, whenever feasible.

- A copy of all applicable permits and approvals, with associated maps, conditions, and conservation measures will be kept onsite at all times.

- A qualified biologist will survey the work area no more than 10 days prior to the start of initial vegetation removal and ground disturbing activities. When a sensitive species is identified, data will be collected as to its identity, location, population size, and population condition. Photos and global positioning system (GPS) data will be collected using a hand-held GPS device. The information collected will be reported to the PM and USFWS (and DAWR) to evaluate potential project activities impacts and, if deemed necessary, modify activities to provide adequate resource protection. The survey will consist of walking the project limits and within the project site to ascertain the possible presence of listed species. The qualified biologist will investigate all potential areas that would be used by special-status species.

- If special-status species are encountered during project construction, all activities which have the potential to result in the harassment, injury, or death of the individual will be immediately halted, and the qualified biologist will be contacted for further direction. To the maximum extent possible, contact with the species will be avoided and it will be allowed to move out of the potentially hazardous situation to a secure location on its own volition. If the species cannot leave the project area on its own, the construction manager and qualified biologist will contact the USFWS (and DAWR) for further guidance.

- The qualified biologist will flag any sensitive natural resources identified within the project area to minimize the risk of unintended disturbance. If active bird nests are found, the qualified biologist will notify the construction manager who will consult with the appropriate resource agency to determine appropriate avoidance buffers; biological monitoring may be required depending on buffer distances and associated project activities. If special-status plant species are found in the project area, individuals will be marked with flagging or construction fencing and avoided during construction activities. Depending on the species, buffer zones around the plants may be established to avoid effects on special-status plants. If special-status plants are observed, environmental training for construction personnel will include identification and location of special-status plants.

- Uniquely-colored tapes will be used for flagging sensitive resources and for marking the boundaries of ecologically sensitive areas such as bird nest buffers. All personnel entering the work sites will be asked to stay out of the flagged environmentally sensitive areas while conducting field activities.

4.2 Potential Beneficial Impacts

By implementing Alternative A, the preferred action, archaeological objects discovered during future construction activities on Guam would be preserved in an up-to-standard storage space. Increased storage capacity would be available to ensure that adequate storage space providing conservation-minded protections is available to meet both current and future demands. Moreover, positive impacts reflect smart land use which would discourage illegal dumping in the project area.

4.3 Conclusions

This EA, prepared by the OEA in compliance with the NEPA, after considering a wide range of regulatory, environmental (both natural and human), and socio-economic factors, has determined that no significant impacts to the environment will result from the implementation of the preferred project alternative, construction of a cultural repository facility in the southeast quadrant of Lot 5372-3A, Maga, Mangilao, Guam.

5.0 REFERENCES

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APPENDIX A

Pre-Consultation Documentation

Date of Initial Contact	Agency/ Organization	Summary of Letter Sent	Date of Agency Response	Summary of Response
03-19-19	GEPA	Summary of project and request for environmental review pursuant to NEPA.	Sent acknowledgement email on 05-20-19. No further response.	Routing request through various divisions.
	DAWR	Summary of project and request for concerns related to wildlife, threatened/endangered species or critical habitat.	05-20-19	Provided list of special-status species potentially occurring near or within the project area. Requested notification if listed species present. Requested ponding basin be included in the project design.

Myounghee Noh & Associates, L.L.C.
Environmental Studies and Consulting Services

March 19, 2019

Matthew L.G. Sablan, Director
Guam Department of Agriculture
Division of Wildlife Resources
163 Dairy Road
Mangilao, Guam 96913

Dear Mr. Sablan:

Subject: University of Guam Cultural Repository Facility at Lot 5372-3A, Maga, Municipality of Mangilao, Island of Guam

Myounghee Noh & Associates, L.L.C. (MNA), has been retained to perform an environmental assessment compliant with the National Environmental Policy Act (NEPA), for a proposed cultural repository facility at Lot 5372-3A, Maga, in Mangilao, Island of Guam.

The University of Guam proposes to construct a cultural repository facility at Lot 5372-3A, Maga, Mangilao, Guam. The purpose of the project is to construct a cultural repository facility that meets collections facility design standards. Currently there is a deficiency in up-to-standard storage space for archaeological objects discovered during construction activities. In the *2011 Programmatic Agreement Among the Department of Defense, the Advisory Council on Historic Preservation, the Guam State Historic Preservation Officer, and the Commonwealth of the Northern Mariana Islands State Historic Preservation Officer Regarding the Military Relocation to the Islands of Guam and Tinian* (2011 PA), the Department of Defense committed to seeking Congressional authorization and appropriation to support the construction of a Guam Cultural Repository.

The 2011 PA was developed in response to the Guam Military Build-Up Final and Supplemental Environmental Impact Statements identification of anticipated affects to historical, archaeological, and cultural resources, and the need for a streamlined process to address the National Historic Preservation Act (NHPA) Section 106 consultation for development projects under the Military Build-Up EIS. Additionally, an increase in archaeological objects discovered was projected as the scheduled construction continues. Therefore, increased storage capacity is essential to ensure that adequate storage space providing conservation-minded protections is available to meet both current and future demands.

The project consists of an approximately 13,000 square foot federally compliant cultural repository building and associated parking. The site is located within the University of Guam Vision 2025 Master Plan on Lot 5372-3A. The U.S. Department of Defense (DOD), Office

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of Economic Adjustment (OEA) has awarded a grant to the University of Guam for the planning, design, and construction of the cultural repository.

Construction will include site clearing and grading, utility connections (water, sewer, electrical, telecommunications, etc.), facility construction, access roads and parking, site drainage, and security fencing. The facility will include administration, meeting, server, break, janitorial, conservation, mechanical/electrical, storage/processing, and photo rooms. Men's and Women's Restrooms will be included as will conservation rooms, wet and dry labs, and high density collection storage spaces. Specialized equipment necessary for operating, sustaining, and maintaining optimal environmental conditions and protections are also included, such as system redundancy through an uninterruptible power supply with battery back-up, emergency lighting, and a 75kW generator; a walk-in freezer room; an environmental data logging system; a rolling service door, and a clean agent (water free) fire suppression system.

This letter serves as our request for a list of any Federally-listed species or proposed critical habitat, as well as threatened or endangered species that may be present in the project area. If you have any specific concerns or suggestions pertaining to this possible effects of this specific proposed project on such species or critical habitat as well as any other wildlife concerns, please let us know 30 days from receipt of this letter. Please also indicate if you would like to receive an electronic copy of the Draft Environmental Assessment upon its publication. If you require additional information, please contact me at 808-283-4310 or jessica@noh-associates.com. Thank you for your attention to this matter.

Sincerely,

Jessica Walsh
Environmental Planner

Enclosure:
Figure 1. Proposed Cultural Repository Location

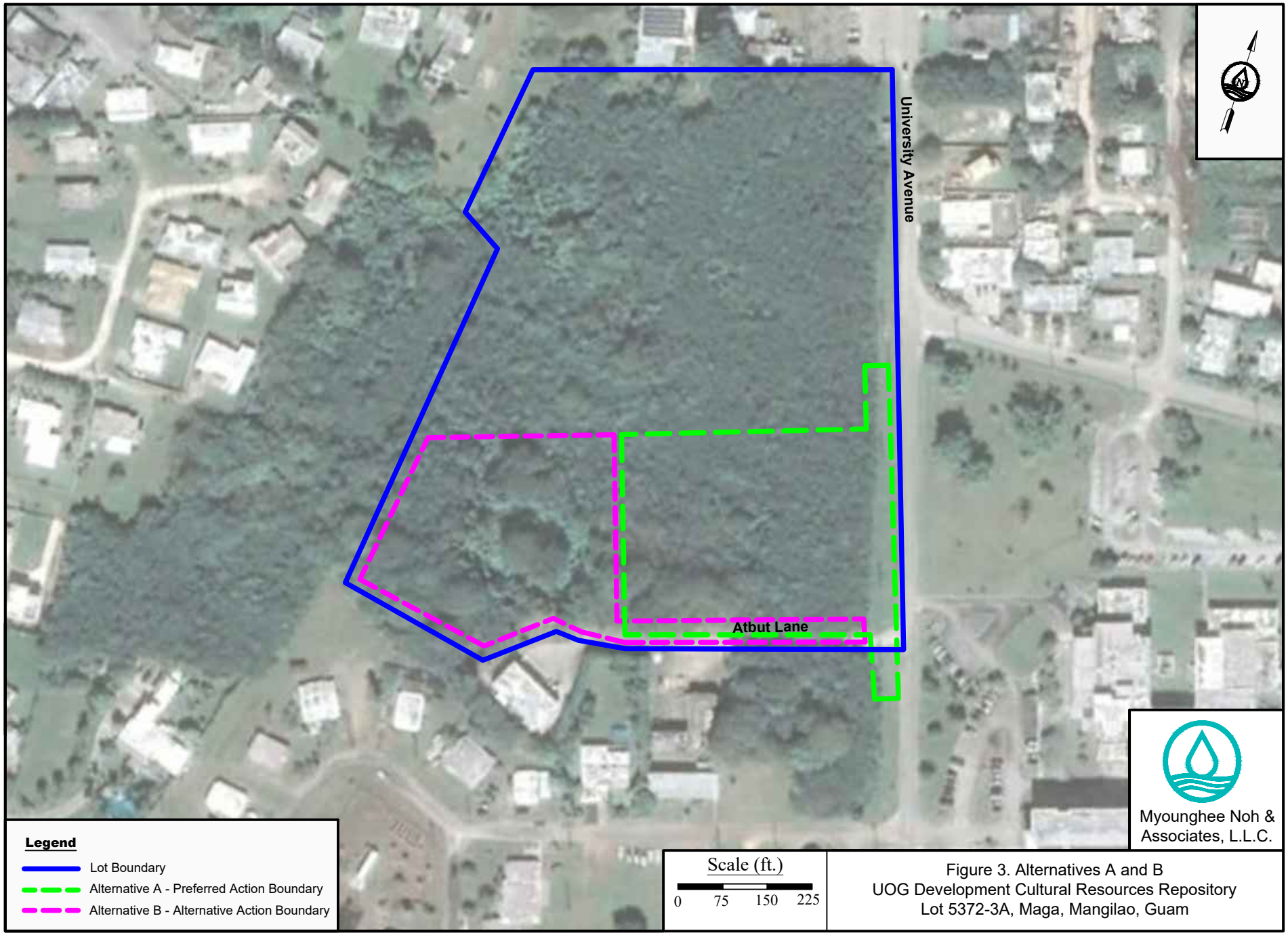

Figure 3. Alternatives A and B
UOG Development Cultural Resources Repository
Lot 5372-3A, Maga, Mangilao, Guam

Department of Agriculture
Dipåttamenton Agrikottura

163 Dairy Road, Mangilao, Guam 96913

Lourdes A. Leon Guerrero
Governor

Joshua F. Tenorio
Lt. Governor

Director's Office	300-7966/64; Fax 734-6569
Agricultural Dev. Services	300-7973/300-7967
Animal Health	300-7965
Aquatic & Wildlife Resources	735-0294/0281; Fax 734-3154
Forestry & Soil Resources	300-7976; Fax 300-3201
Plant Nursery	300-7974
Plant Inspection Facility	475-1426/27; Fax 477-9487

Chelsa Muna-Brecht
Director

May 20, 2019

Ms. Jessica Walsh
Myounghee Noh & Associates, L.L.C.
200 Kohola St.
Hilo, Hawaii 96720

Subject: Environmental Consultation for UOG's Cultural Repository Facility Project at Lot 5372-3A, Maga, Mangilao

Hafa adai Ms. Walsh:

The Department of Agriculture's Division of Aquatic and Wildlife Resources (GDAWR) reviewed your request for an environmental consultation for the University of Guam's cultural repository facility at Lot 5372-3A, Maga, Mangilao.

There are several Guam flora and fauna species that are federally protected under the Endangered Species Act (ESA), the Migratory Bird Treaty Act (MBTA), as well as Guam's Endangered Species Act. Table 1 is a list of protected species that may occur on or near project site.

Table 1: List of Protected species potentially present at, or adjacent to, project sites.

Common name	Latin name	Authority
Guam tree snail	*Partula radiolata*	Federal and Local ESA
Mariana fruitbat	*Pteropus m. mariannus*	Federal and Local ESA
Micronesian starling	*Aplonis opaca*	Local ESA
White-throated ground dove	*Gallicolumba xanthornura*	Federal and Local ESA
Yellow bittern	*Ixobrychus sinensis*	MBTA
Other migratory bird species		MBTA

Of the species identified in **Table 1**, the Mariana fruitbat, Micronesian starling, white-throated dove, yellow bittern, and migratory birds are opportunistic species. These species may forage, roost, or transit near the project sites. If any species listed under the Federal or local ESA and MBTA is present on the project

sites all work must cease immediately and Guam DAWR must be informed. Migratory birds occur on Guam during the months of August to May. Species protected under the MBTA must be allowed to persist on site until they leave of their own volition. The Guam tree snail occurs in moist environments with vegetation that provides shelter from natural elements. They are much easier to detect during the rainy season, having spent most of their time hidden in moist areas during the dry season or mid-day hours.

Table 1 does not include native vegetation that was listed under the Federal ESA. On October 1, 2015, seventeen plant species were listed under protection. For more information on these species and the final listing, visit http://www.fws.gov/pacificislands/.

In addition to the request for environmental consultation for the proposed project, GDAWR recommends that the installation of a ponding basin be included in the design for development. The ponding basin will serve as remediation for erosion and flooding caused by the inundation of rainfall Guam experiences during the wet season.

We look forward to providing further guidance and working with you through the completion of this project. If you have any questions or comments please contact Mr. Jeffrey Quitugua at 735-0294 or Jeffrey.Quitugua@doag.guam.gov.

Sincerely,

Chelsa Muña- Brecht
Director

Myounghee Noh & Associates, L.L.C.
Environmental Studies and Consulting Services

March 19, 2019

Walter Leons Guerrero, Administrator
Guam Environmental Protection Agency
17-3304 Mariner Avenue
Tiyan Barrigada, Guam 96913

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Subject: University of Guam Cultural Repository Facility at Lot 5372-3A, Maga, Municipality of Mangilao, Island of Guam

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The project consists of an approximately 13,000 square foot federally compliant cultural repository building and associated parking. The site is located within the University of Guam Vision 2025 Master Plan on Lot 5372-3A. The U.S. Department of Defense (DOD), Office

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This letter serves as our request for environmental impact review pursuant to the National Environmental Policy Act. Please provide comments concerning the proposed project based upon the scope of work outlined above, and also indicate if you would like to receive an electronic copy of the Draft Environmental Assessment upon its publication. If you have any specific concerns or suggestions pertaining to this specific proposed project, please let us know 30 days from receipt of this letter. If you require additional information, please contact me at 808-283-4310 or jessica@noh-associates.com. Thank you for your attention to this matter.

Sincerely,

Jessica Walsh
Environmental Planner

Enclosure:
Figure 1. Proposed Cultural Repository Location

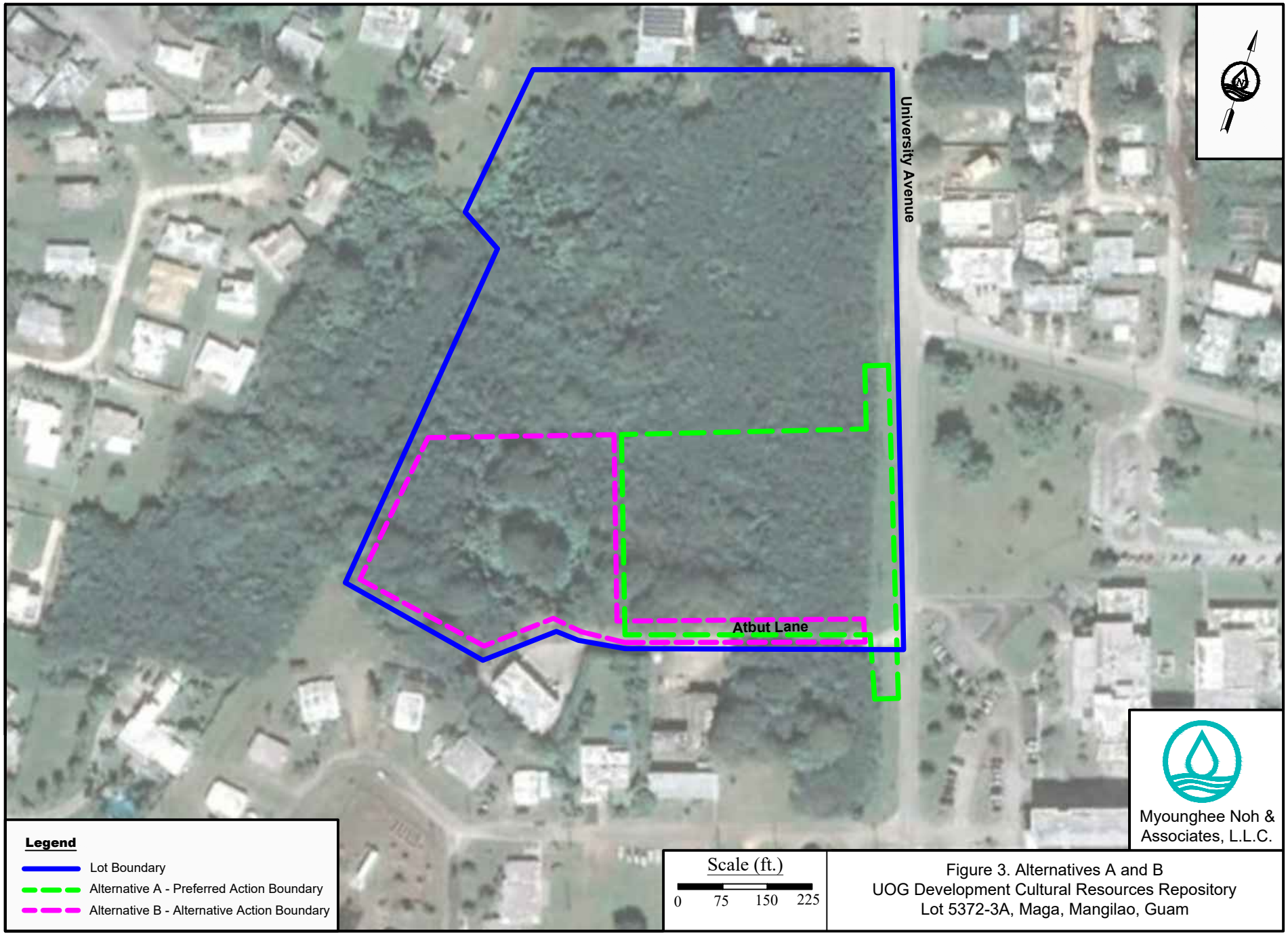

Figure 3. Alternatives A and B
UOG Development Cultural Resources Repository
Lot 5372-3A, Maga, Mangilao, Guam

From: Nic Rupley
To: Jessica Walsh; Celeste Lim
Cc: Arlene Acfalle
Subject: Lot 5372-3A, Maga, Municipality of Mangilao, Island of Guam
Date: Monday, May 20, 2019 1:36:47 PM
Attachments: GEPA_PNG.png

Hafa Adai and Hello Ms. Lim and Ms. Noh,

Thank you for your patience with our research. I made a follow up with the other programs to provide responses to your request.
As of May 1, we provided a response from our hazardous waste management program. I've requested the other programs to expedite their responses today.

I'll be sending them to you as I receive them

Regards,

Nic Rupley Lee
Public Information Officer
17-3304 Mariner Avenue Tiyan,
Barrigada, Guam 96913-1617
Telephone: 671.300.4753

APPENDIX B

ESA Section 7 Compliance Documentation

Date	Letter	Sent by	Received by	Note
11-07-2019	Biological Assessment	MNA	USFWS	--
12-11-2019	Concurrence on Determination	USFWS	MNA	Mitigation included

Draft—Biological Assessment for the University of Guam Cultural Repository Facility, Lot 5372-3A, Maga, Municipality of Mangilao, Guam

U.S. Fish and Wildlife Service Reference No. 2019-SL-0287

Prepared For:

Pacific Islands Fish and Wildlife Office
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GANDA Report No. 2423-2-1

14 August 2019
Revised 7 November 2019

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FIGURES

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1.0 BACKGROUND

The purpose of this Biological Assessment is to address the effect of the University of Guam (UOG) Cultural Repository Facility Project on species listed as threatened or endangered under the Endangered Species Act (ESA), or their designated critical habitat. The U.S. Department of Defense Office of Economic Adjustment awarded a grant to the Office of the Governor, with the UOG being a sub-recipient responsible for the planning, design, and construction of the cultural repository. Federal agencies must consult with the U.S. Fish and Wildlife Service (USFWS or Service) when any action the agency carries out, funds, or authorizes (such as through a permit) may affect a listed endangered or threatened species under Section 7 of the ESA.

The project involves construction of an approximately 13,000 square foot federally compliant cultural repository facility on Lot 5372-3A, Maga, Mangilao, Guam (action area). The USFWS Pacific Islands Fish and Wildlife Office has reviewed the project and determined that it has the potential to impact the following ESA-listed wildlife species that may occur in the action area: threatened Mariana fruit bat (*Pteropus mariannus mariannus*), endangered humped tree snail (*Partula gibba*), endangered Guam tree snail (*Partula radiolata*), endangered fragile tree snail (*Samoana fragilis*), and the endangered Marianas eight-spot butterfly (*Hypolimnas octocula marianensis*) (USFWS 2019a). The following ESA-listed plant species may occur in the action area: threatened fadang (*Cycas micronesiaca*), threatened *Bulbophyllum guamense* (siboyas halumtanu), threatened *Dendrobium guamense* (no common name [NCN]), threatened *Tuberolabium guamense* (NCN), and the endangered *Nervilia jacksoniae* (NCN) (USFWS 2019a). No critical habitat occurs within or near the action area (USFWS 2019a, 2019b). Guam-listed species are also addressed in this assessment.

In their species list consultation letter, the Pacific Islands Fish and Wildlife Office recommended obtaining a list of federally protected bird species from USFWS staff member Jenny Hoskins (2019a). This information was requested from Ms. Hoskins via email on June 26, 2019. At the time of this report, no response has been received. The full list of locally occurring species protected under the federal Migratory Bird Treaty Act (MBTA) was reviewed in preparation of this report.

This Biological Assessment addresses the proposed action in compliance with Section 7 of the ESA. Section 7 assures that, through consultation (or conferencing for proposed species) with the Service, federal actions do not jeopardize the continued existence of any threatened, endangered or proposed species, or result in the destruction or adverse modification of critical habitat.

The purpose of the proposed action is to provide a location to store artifacts and ancestral remains found during the military buildup of Guam (discussed below).

2.0 DESCRIPTION OF THE ACTION AND ACTION AREA

2.1 Proposed Action

The proposed action involves construction of a cultural repository facility at Lot 5372-3A, Maga, Mangilao, Island of Guam. In the 2011 *Programmatic Agreement Among the Department of Defense, the Advisory Council on Historic Preservation, the Guam State Historic Preservation Officer, and the Commonwealth of the Northern Mariana Islands State Historic Preservation Officer Regarding the Military Relocation to the Islands of Guam and Tinian* (2011 PA), the

Department of Defense committed to seeking Congressional authorization and appropriation to support the construction of a Guam Cultural Repository to store artifacts and ancestral remains found during construction for the military buildup. Construction associated with development of the facility will include site clearing and grading, utility connections (water, sewer, electrical, telecommunications, etc.), facility construction (13,000 square foot single story building), access roads and parking, site drainage, and security fencing.

2.2 Action Area

The proposed action area consists of 2 hectares (5 acres) along the southern portion of Lot 5372-3A in Mangilao, Guam (Figures 1 and 2). Lot 5372-3A is bounded by University Avenue on the east and Atbut Lane on the south. The areas to the north and west of the action area are currently undeveloped. The action area extends approximately 400 feet north of Atbut Lane and 30 feet south of Atbut Lane, and approximately 720 feet west of University Avenue and 30 feet east of University Avenue. The proposed action area accounts for all construction work associated with the proposed action, including access, vehicle parking, equipment staging, and material stockpiling.

Guam is the largest and southernmost island in the Mariana Islands archipelago. Situated at 13 degrees north latitude and 144 degrees east longitude, the island experiences a tropical marine climate that is typically hot and humid throughout the year. Precipitation averages from 216 to 292 centimeters per year with the wet season beginning in July and the dry season beginning in December (Gingerich 2003).

Geologically, Guam is divided into two distinct regions separated by the Pago-Adelup Fault. The northern half of Guam is a broad undulating uplifted limestone plateau bounded by sea cliffs, while the southern portion of Guam features rugged volcanic highlands with ravines and protected embayments. The action area is situated on the northern limestone plateau where freshwater resources are limited due to the permeability of the porous limestone.

Soils on the northern plateau of Guam are generally entisols, consisting of poorly-developed soils without B-horizons (Young 1988). These typically very shallow soils developed from the erosion of the limestone plateau and the decomposition of organic matter. Soils classified within the action area consist exclusively of the Guam cobbly clay loam series with 3 to 7 percent slopes (Young 1988) (Figure 3). This soil series consists of very shallow, well-drained soils that developed from the underlying porous coralline limestone. Depth to limestone ranges from 5 to 40 centimeters. Permeability of these shallow soils is moderately rapid, runoff is slow, and the hazard of water erosion is slight.

Liu and Fischer (2006) classify the vegetation of the project area as Leucaena Stand, characterized by a dense thicket of tangantangan (*Leucaena leucocephala*) with continuous canopy up to 10 meters high. Leucaena Stand typically has a very low diversity of plants, and invasive herbs and vines are common. This plant community stems from previous land clearing and disturbance.

Most of the extant native vegetation on the Mariana Islands occurs on steep limestones cliffs and ridgelines or other areas where topography has limited conversion of the land to urban or agricultural use. Most other areas on Guam have been impacted by at least 4,000 years of human

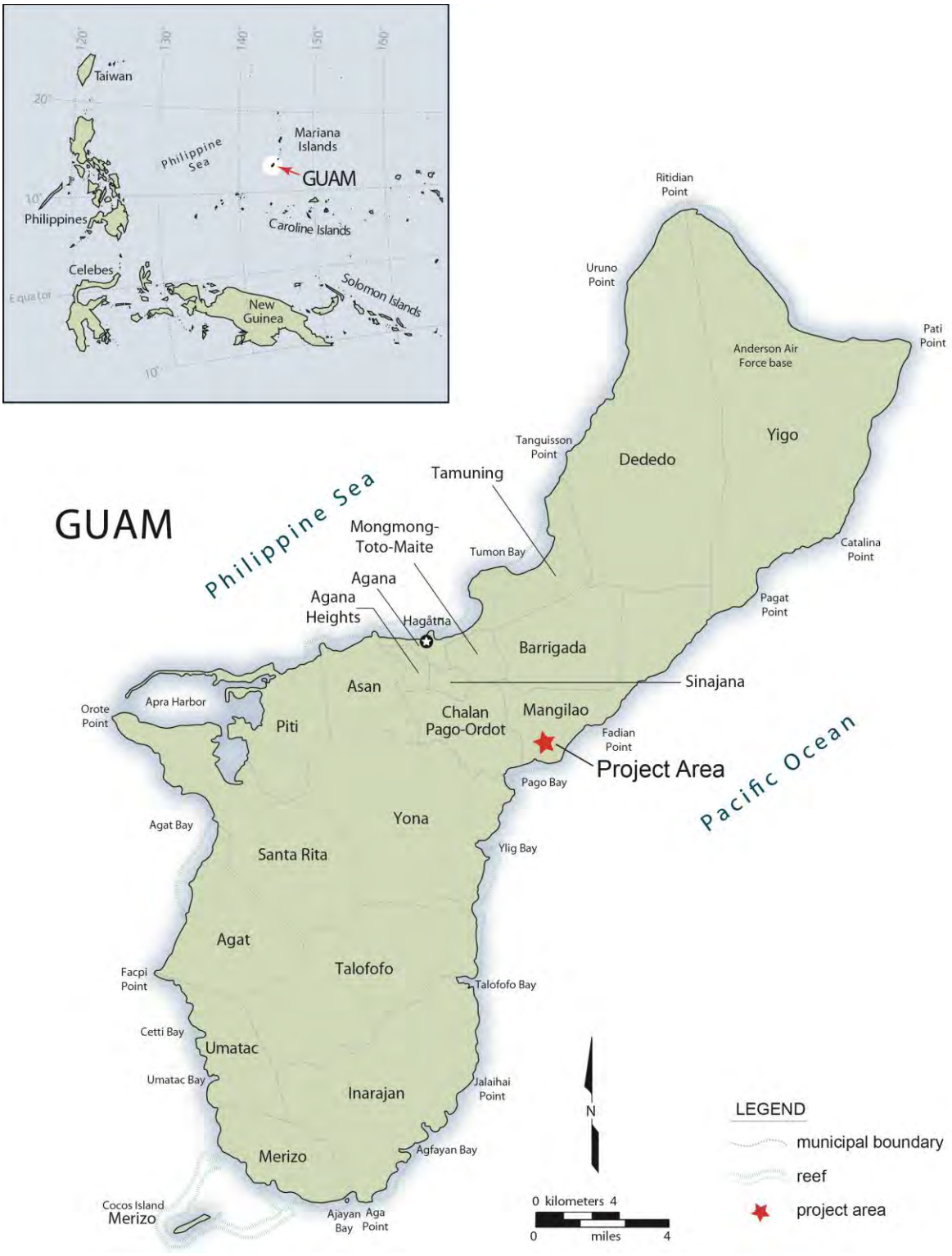

Figure 1. Project area within the western Pacific and the island of Guam.

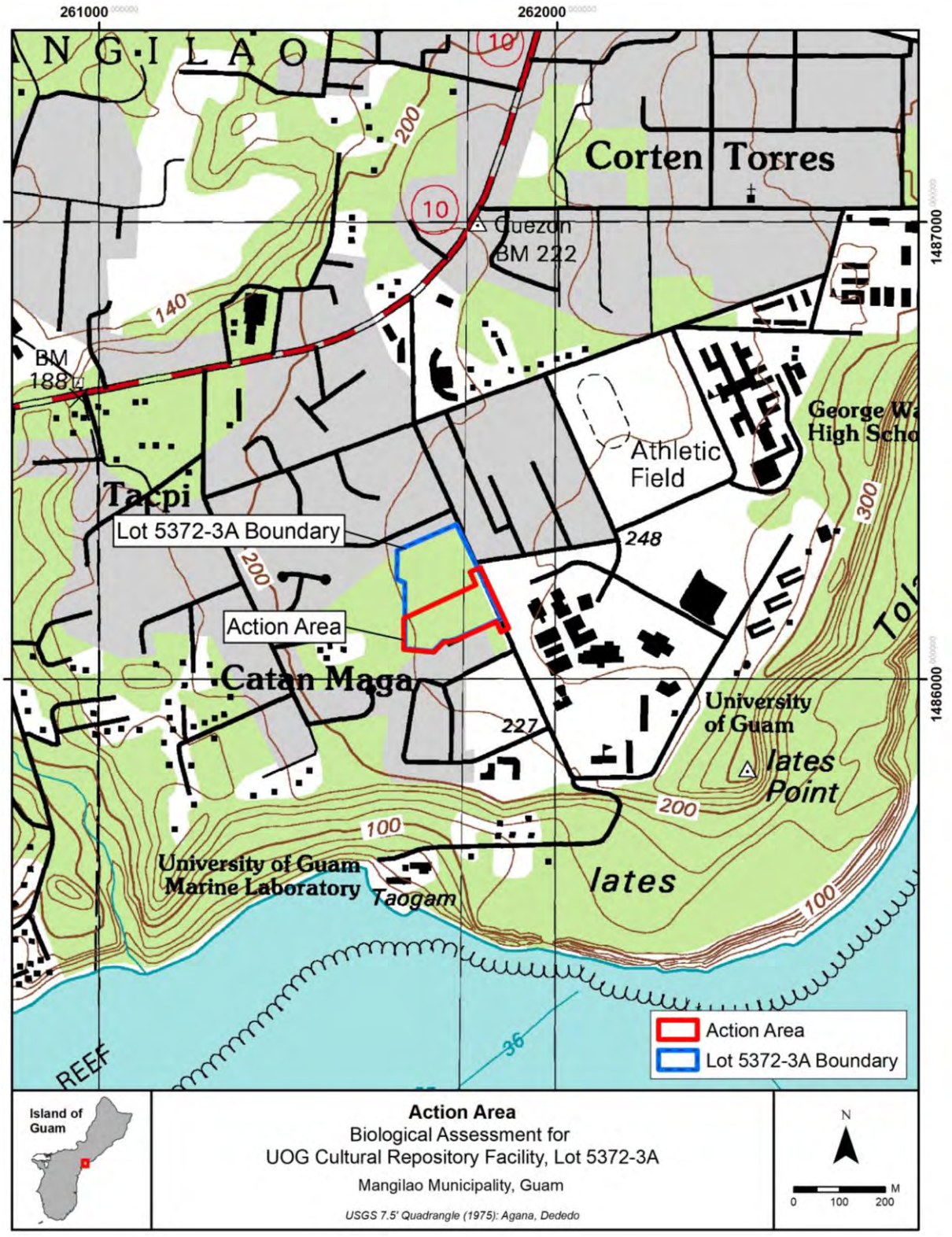

Figure 2. Action area shown on 1975 USGS 7.5-minute Agana and Dededo quadrangles.

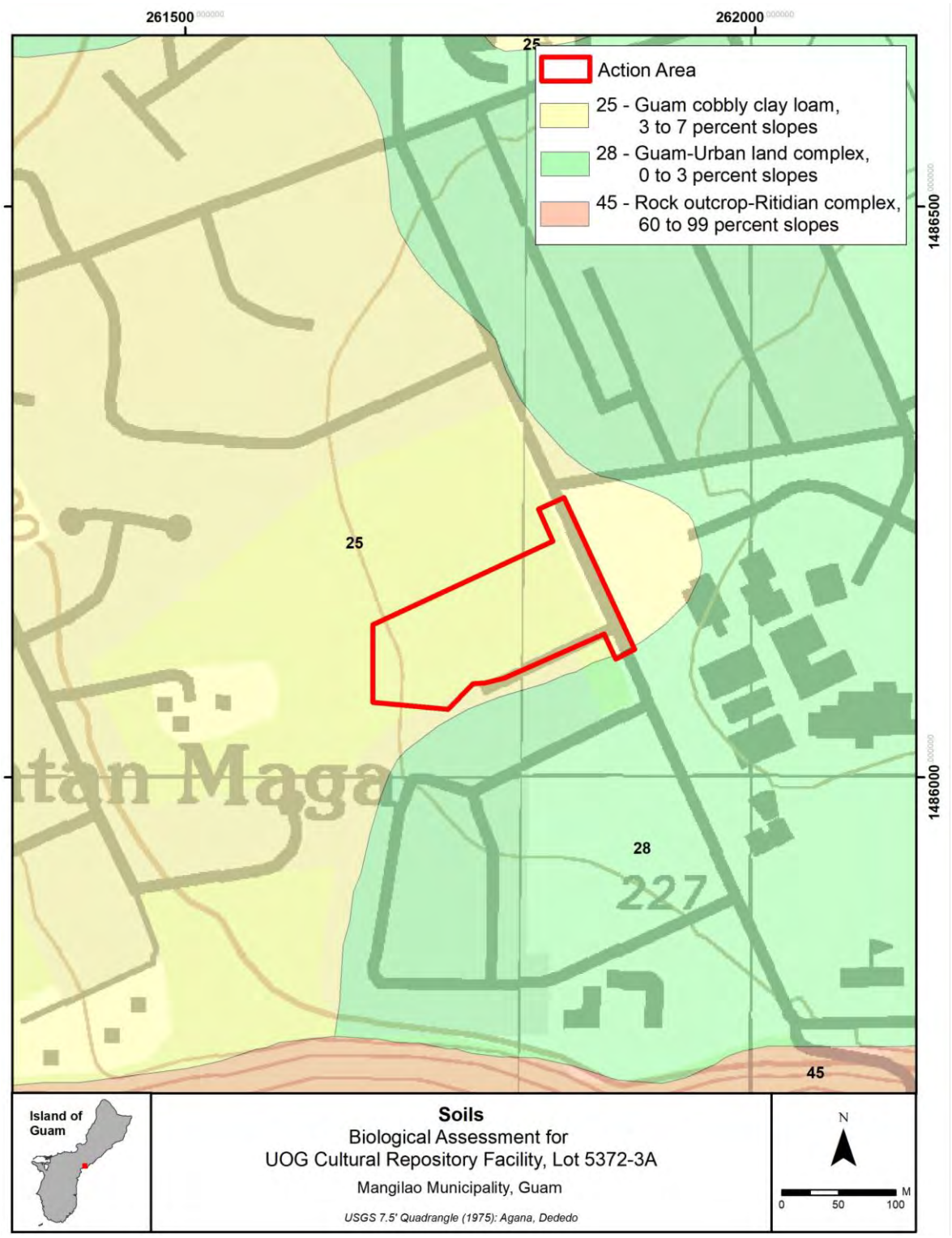

Figure 3. Soils within the action area.

occupation starting with the CHamoru, followed by the Spanish, Germans, Japanese, and Americans (USFWS 2015). Native plants of Guam have been impacted heavily by foraging and trampling from feral pigs (*Sus scrofa*), goats (*Capra hircus*), water buffalo (*Bubalus bubalis*), Philippine deer (*Cervus marianus*), non-native rodents, and insects (USFWS 2015). Predation by non-native animals (rats [*Rattus* spp.], brown tree snake [*Boiga irregularis*], and skinks) have reduced or eliminated native birds, tree snails, bats, and skinks leading to alterations in seed dispersal for native plants. Non-native plants species often alter entire ecosystems by forming monotypic stands after disturbances.

The brown tree snake is believed to be responsible for the extirpation of 13 of Guam's 22 native bird species (including all but one of its native forest bird species) and for contributing to the elimination of native bats and skinks (USFWS 2015). This species has had devastating impacts on the native fauna of Guam, which are unlikely to recover until effective management or eradication programs can be established. Monitor lizards (*Varanus indicus*) feed on a large variety of prey animals including native bats, birds, and skinks. Habitat destruction by ungulates and direct predation by rodents and the non-native manokwar flatworm (*Platydemus manokwari*) have resulted in elimination or significant declines in native tree snail populations (USFWS 2015).

3.0 LISTED SPECIES AND CRITICAL HABITAT

3.1 Methods

Due to past land use, much of the project area has been disturbed; however, wetlands/waterways and some threatened, endangered and sensitive (TES) species may still occur in or pass through the project area. The objective of this section is to identify potential occurrences of TES, critical habitat, or other sensitive natural resources that may be present and/or impacted by the proposed action. A desktop review and field surveys were conducted to identify potential threatened or endangered species that could be affected by the proposed action.

3.1.1 Desktop Review

The following designations and regulations were used to define sensitive resources:

1. Threatened, endangered, or candidate for listing under the ESA (including critical habitat for protected species);
2. Bird species listed as protected under the MBTA;
3. Threatened or endangered under the ESA of Guam; and
4. Wetlands or other waters under Section 404 of the federal Clean Water Act.

A preliminary desktop review was conducted to assess historical records for protected species and sensitive habitats within or near the project area, including:

1. Review of relevant biological protection policies, sensitive and priority habitats, and species of concern in publicly available databases and reports.
2. Review the USFWS Environmental Conservation Online System (ECOS) data and MBTA list.
3. Query of the National Wetlands Inventory (NWI) database and U.S. Geological Survey (USGS) maps.

3.1.2 Field Surveys

3.1.2.1 Reference Site Visit

On July 28, 2019, Garcia and Associates senior ecologist Susan Dewar (field lead) conducted a reference site visit to the Guam National Wildlife Refuge, Ritidian Unit (Refuge) to observe listed species with potential to occur in the action area. Ms. Dewar identified numerous individuals of federally threatened fadang. Two individuals of the Guam-listed fire tree (*Serianthes nelsonii*; saplings within protective fencing, apparently in association with Refuge outplanting efforts) were also positively identified at the reference site.

3.1.2.2 Action Area Survey

A field survey of the action area evaluating botanical and wildlife resources, including habitat suitability for special status species, and a floristic survey, was conducted from July 29 through July 31, 2019. The field survey, led by Garcia and Associates senior ecologist Susan Dewar, was performed by walking transects the full extent of the action area at 50-foot (15-meter) spacing. Observations were made of current land use, nature and degree of disturbance, physical topography, site physiognomy (characteristic species and related features of the associated plant community or vegetation), current wildlife use, and presence or potential presence (permanent or transitional) of listed plant or wildlife species.

All wildlife species observed during the field survey were identified and recorded (Appendix A Table 1-A), and all vascular plant species encountered were identified to the level necessary to determine status (floristic, Appendix A Table 1-B). Multiple sources (many outdated or without floristic keys) were used to aid in plant identification (Stone 1970, Chin 1985, Wagner et al. 2012, Kuo and Berry 2018, Raulerson and Rinehart 2018, UOG 2019, and others). Nomenclature follows the most current scientific name known and may differ from previous publications.

Field data were collected with a global positioning system (GPS)-capable Apple iPad Mini device equipped with a 3-meter-accurate GPS receiver running ESRI Collector for ArcGIS version 10.6.1 software.

Survey transects were pre-loaded into the Collector map of the action area (Figure 4). The transects were first surveyed to compile a floristic list of species within the action area, to search for host plants or other potentially suitable habitat for special status species, and to provide a general survey of habitats and wildlife use or presence. An approximate grid of point count/timed area search locations was established across the action area at 150-foot (45-meter) spacing after the transect survey. Surveyors spent 20 minutes at each of these locations identifying avian wildlife species (point count; 10 minutes at each location; various radii [25–100 meters] limited by dense vegetation in most areas) and searching for tree snails, butterflies, and skinks (timed area search; 10 minutes at each location; approximately 10-meter radius). Incidental observations at or between point counts were recorded. A brief nocturnal survey was performed with flashlights to target gecko species from 4:30 am to 6:00 am on July 31, 2019 followed by an additional sunrise (6:00 am to 6:30 am) avian survey of open canopy and edge habitats with higher avian use and good visual access. Visual searches were conducted for bat species; no acoustic surveys were conducted.

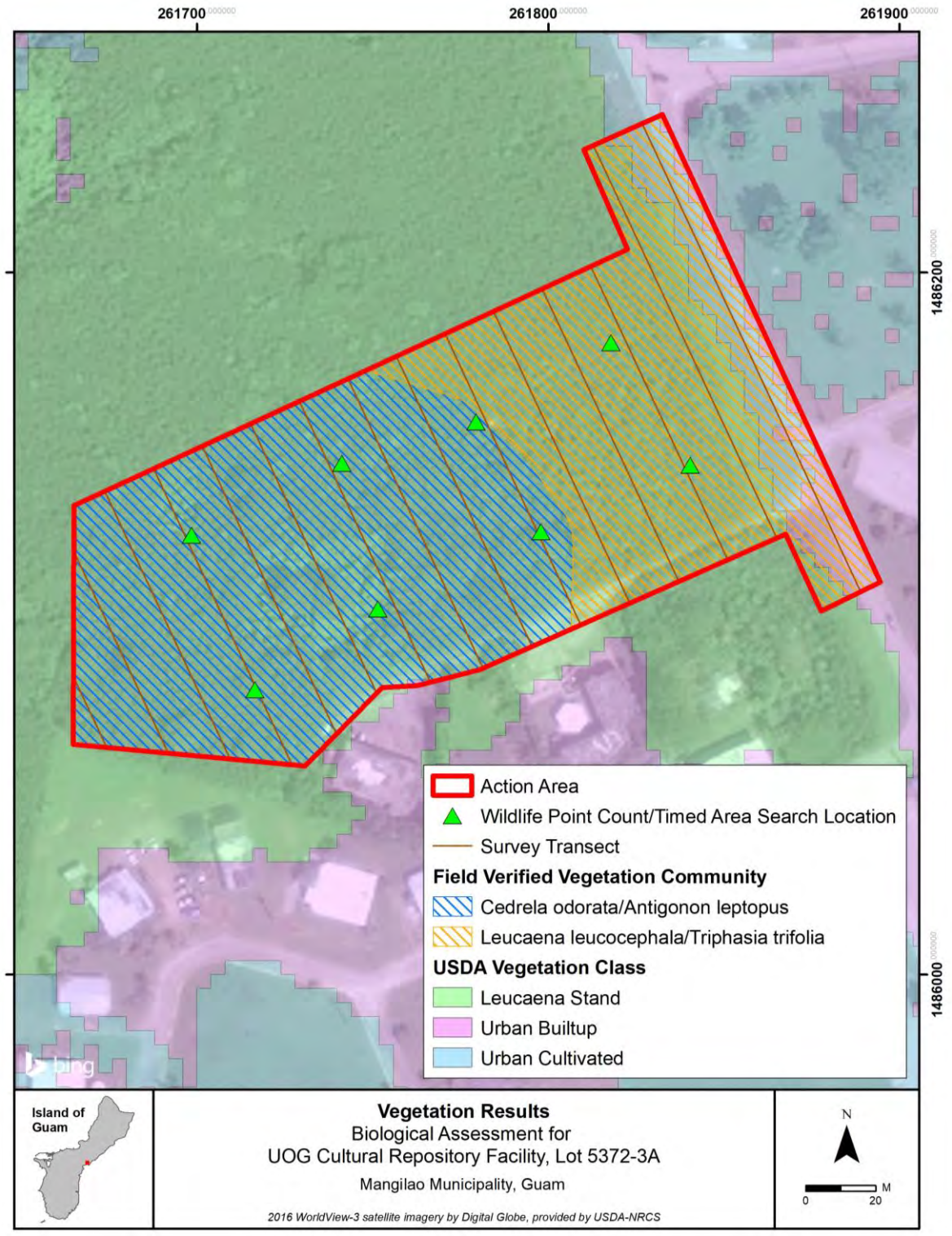

Figure 4. Vegetation within the action area.

3.2 Results

Weather conditions were clear and ranged from the high 70-degrees Fahrenheit (°F) range in the early morning to the high 80°F range in the late morning/early afternoon with approximately 90% humidity. The region received some precipitation during the 3-day period over which surveys were conducted, but only trace precipitation occurred during surveys. Winds were calm during all surveys. Significant human-caused noise was observed, especially during morning hours, from maintenance vehicles and equipment at the UOG campus (garbage trucks, lawn mowers, string trimmers, leaf blowers, passenger vehicles, etc.).

3.2.1 Existing Habitats

3.2.1.1 Critical Habitat

No federally designated or proposed critical habitat has been identified in the action area at this time (USFWS 2019a, 2019b). The proposed action will have no effect on critical habitat.

3.2.1.2 Wetlands and Other Waters

No wetlands or other water features were known to occur in the action area and no areas exhibiting signs of wetland hydrology were observed during the survey. The site lacks hydrophytic vegetation and hydric soils. Therefore, no wetlands are present or will be affected by the proposed action.

3.2.1.3 Secondary Forest/Leucaena Stand

The field survey confirmed that the dominant vegetation within the eastern portion of the action area is a secondary forest (Leucaena Stand), characterized by a dense thicket of non-native tangantangan with continuous canopy. This forest has a very low diversity of plants, and non-native shrubs and vines are common. Tangantangan is the dominant overstory species with some native noni (*Morinda citrifolia*) and a dense understory of non-native limeberry (*Triphasia trifolia*) and latherleaf (*Colubrina asiatica*) (Figure 4; Appendix B Photo 1). The western portion of the action area is more open with a tall, discontinuous canopy dominated by non-native Spanish cedar (*Cedrela odorata*) with some non-native flame tree (*Delonix regia*). Small understory tangantangan and noni are covered by non-native coral vine (*Antigonon leptopus*) which provides a dense cover over the ground surface and all trees and shrubs on this portion of the site (Appendix B Photo 2). Dumping of trash and other human disturbances are common throughout the action area.

3.2.2 Listed Species and Suitable Habitats

No listed species were observed during the field survey (Table 1). No high-quality suitable habitat for listed species was observed (Table 1).

Plant surveys were comprehensive and overall diversity of native plants observed was low. Of 44 plant species identified within the action area only 15 may be considered native or naturalized depending on the source and definition (Appendix A Table 1-B). The secondary growth non-native forest provides marginally suitable habitat for listed plant species, however light and humidity conditions may not be suitable for epiphytic orchids and ground orchids. No listed plant species were observed.

Table 1. Threatened or Endangered Species with Potential to Occur in the Action Area

NAME / STATUS	SPECIES KNOWN IN ACTION AREA	SUITABLE HABITAT PRESENT IN ACTION AREA	EFFECT DETERMINATION[1]	HABITAT NEEDS AND SUITABILITY
Plants				
Bulbophyllum guamense Cebello halumtano **Threatened (ESA)**	**No**	**Marginal**	**No effect**	An epiphyte in the orchid family (Orchidaceae), known to inhabit cliff lines encircling Guam and on the forested slopes of Mt. Lamlam and Mt. Almagosa (USFWS 2015). Most commonly found in humid, moist areas on the trunks and branches of trees (GPEPP 2019). Single leave; leaves oblong, elliptic; flowers greenish (Stone 1970). Currently, there are 3 known occurrences on Guam totaling fewer than 250 individuals (USFWS 2015). **Not observed during survey.**
Cycas micronesica Fadang **Threatened (ESA)**	**No**	**Yes**	**No effect**	Stout, palm-like tree up to 6 m tall; leaves pinnate, leaflets 1-2 cm wide, not sharp tipped (Stone 1970). *Cycas micronesica* was previously widespread on Guam throughout forested habitats, however rapid mortality (up to 92% on Guam) is occurring due to a nonnative insect, the cycad aulacaspis scale (*Aulacaspis yasumatsui*) (USFWS 2015). Stone (1970) described the species as common throughout the island, particularly on undisturbed forests on limestone near the sea. **Not observed during survey.**
Cyathea lunulata Tree fern Endangered (Guam)	**No**	**No**	**No effect**	Tree fern with large tripinnate fronds (up to 2 m long); trunk to 5 m; reported as exceedingly rare in the hills of Guam (Stone 1970). Habitat includes savanna and narrow ravines (GPEPP 2019). **Not observed during survey.**
Dendrobium guamense **Threatened (ESA)**	**No**	**Marginal**	**No effect**	Epiphytic orchid (occasional lithophyte) up to 60 cm tall; leaves 10 cm long, 7-15 mm wide; racemes of two flowers, shorter than the leaves, emerging from sheaths between leaves (GPEPP 2019). The species was previously common in trees on Guam; however, there are now four known occurrences totaling fewer than 250 individuals (USFWS 2015). **Not observed during survey.**

Table 1. (continued)

NAME / STATUS	SPECIES KNOWN IN ACTION AREA	SUITABLE HABITAT PRESENT IN ACTION AREA	EFFECT DETERMINATION[1]	HABITAT NEEDS AND SUITABILITY
Heritiera longipetiolata Ufa halom tano; looking glass tree **Endangered (ESA)** Endangered (Guam)	**No**	**Marginal**	**No effect**	Forest tree in the hibiscus family (Malvaceae); ovate leaves 15-30 cm long, 8-15cm wide, upper surface dark green, lower surface silvery-tawny; bark light brown with white patches; generally tallest tree in the canopy (GPEPP 2019). Axillary flowers lacking petals; petioles 4-6 cm long; found on limestone cliffs (Stone 1970). Four known occurrences on Guam totaling 90 individuals (USFWS 2015). **Not observed during survey.**
Nervilia jacksoniae **Endangered (ESA)**	**No**	**Marginal**	**No effect**	*Nervilia* species are terrestrial, tuberose orchids with single subrotund-cordate leaves that appear alternately with leafless flower-bearing scape (Stone 1970); flowers appear first (GPEPP 2019). Typically found in shady places in rocky areas with leaf litter during the rainy season (GPEPP 2019). There are currently two known occurrences on Guam totaling less than 200 individuals (USFWS 2015). **Not observed during survey.**
Serianthes nelsonii Håyun lagu; fire tree Endangered (Guam)	**No**	**Marginal**	**No effect**	*Serianthes nelsonii i*s a large tree of limestone forests with twice-pinnate compound leaves and flowers with long pinkish filaments (GPEPP 2019). Seed pod thick and woody 7-12 cm long with constriction between seeds (Stone 1970; GPEPP 2019). **Not observed during survey.**
Tuberolabium guamense **Threatened (ESA)**	**No**	**Marginal**	**No effect**	An epiphyte in the orchid family previously found in moist shady (~60% light) areas, common in higher elevations in southern Guam and older limestone forests in northern Guam (GPEPP 2019). Leaves are ovate-oblong; flowers are small and white on a rachis up to 4 cm long; roots lift the orchid from its host (GPEPP 2019). Currently known from one occurrence of one individual on Guam in the forest ecosystem (USFWS 2015). **Not observed during survey.**

Table 1. (continued)

NAME / STATUS	SPECIES KNOWN IN ACTION AREA	SUITABLE HABITAT PRESENT IN ACTION AREA	EFFECT DETERMINATION[1]	HABITAT NEEDS AND SUITABILITY
Invertebrates				
Mariana eight-spot butterfly *Hypolimnas octocula marianensis* **Endangered (ESA)**	**No**	**No (host plants not observed; suitable habitat for host plants not observed)**	**No effect**	The Mariana eight-spot butterfly is an orange and black butterfly endemic to the forest systems of Guam and Saipan (USFWS 2015). The caterpillar larva of this species is black in color with red spikes and a black head, differentiating it from similar appearing caterpillars (Schreiner and Nafus 1997, in USFWS 2015). The larvae feed on the two local forest herbs, *Procris pedunculata* (no common name [NCN]) and *Elatostema calcareum* (tapun ayuyu) (USFWS 2019a), found only on limestone karst substrate within the forest ecosystem, draped over boulders and cliffs where ungulates can't browse on the plants (USFWS 2015). **Not observed during survey.**
Humped tree snail *Partula gibba* **Endangered (ESA)** Endangered (Guam)	**No**	**Marginal**	**May affect, but not likely to adversely affect**	The humped tree snail is endemic to forest ecosystems. The color ranges from white to brown, and a pointed apex is colored rose-red, with a milky white suture. In general, partulid snails may live up to 5 years. They reproduce in less than 1 year, at which time they can produce up to 18 young each year. Partulids are ovoviviparous (give birth to live young), more mobile during higher ambient humidity and precipitation and less mobile during dry periods, live on bushes or trees, and feed primarily on dead or decaying plant material (USFWS 2015). The humped tree snail occurs in cool, shaded forest habitat, with high humidity and reduced air movement that prevents excessive water loss. Crampton (1925, in USFWS 2015) described the habitat requirements of the partulid tree snails as having "sufficiently high and dense growth to provide shade, to conserve moisture, and to effect the production of a rich humus. Hence the limits to the areas occupied by tree snails are set by the more ultimate ecological conditions which determine the distribution of suitable vegetation." Crampton further notes that the Mariana Islands partulid tree snails live on subcanopy vegetation and are not found in high canopy (USFWS 2015). Although tree snails in the Mariana Islands likely evolved to live upon native

Table 1. (continued)

NAME / STATUS	SPECIES KNOWN IN ACTION AREA	SUITABLE HABITAT PRESENT IN ACTION AREA	EFFECT DETERMINATION[1]	HABITAT NEEDS AND SUITABILITY
Humped tree snail (continued)				vegetation, there is no clear indication of obligate relationships with any particular type of tree or plant (Fiedler 2014, in USFWS 2015). Mariana partulid snail species are observed to use nonnative ‘‘home plants’’ to which they have apparently adapted (USFWS 2015). The number of individuals of the humped tree snail on Guam is estimated to be fewer than 150 (USFWS 2015). **Not observed during survey.**
Guam tree snail *Partula radiolata* **Endangered (ESA)**	**No**	**Marginal**	**May affect, but not likely to adversely affect**	The Guam tree snail is endemic to the forest ecosystem of Guam (USFWS 2015). The shell of the Guam tree snail is pale straw-colored with darker streaks and brown lines, and has impressed spiral lines. The Guam tree snail prefers the same cool, shaded forest habitat as the humped tree snail, described above. There are 26 or fewer known colonies of Guam tree snail on Guam (USFWS 2015). **Not observed during survey.**
Mt. Alifan tree snail *Partula salifana* Endangered (Guam)	**No**	**No**	**No effect**	The Mt. Alifan tree snail was only known from the summit of Mount Alifan and two adjacent peaks on the southwest coast of Guam; it is thought to be extinct (Kerr and Bauman 2013). **Not observed during survey.**
Fragile tree snail *Samoana fragilis* **Endangered (ESA)**	**No**	**Marginal**	**May affect, but not likely to adversely affect**	The fragile tree snail is known from the forest ecosystems of Guam and Rota. The common name is derived from the thin, semi-transparent nature of the shell (USFWS 2015). The shell has delicate spiral striations intersected by transverse growth striations. The biology and habitat for this partulid tree snail are the same as those described for humped tree snail (see above). Currently, only two colonies are known on Guam (USFWS 2015). **Not observed during survey.**

Table 1. (continued)

NAME / STATUS	SPECIES KNOWN IN ACTION AREA	SUITABLE HABITAT PRESENT IN ACTION AREA	EFFECT DETERMINATION[1]	HABITAT NEEDS AND SUITABILITY
Mammals				
Pacific sheath-tailed bat (Mariana subspecies) *Emballonura semicaudata rotensis* **Endangered (ESA)** Endangered (Guam)	**No**	**No**	**No effect**	Pacific sheath-tailed bats are nocturnal and roost during the day in a wide range of cave-types, including overhanging cliffs, limestone solution caves, crevices, and lava tubes, and emerge shortly before sunset to forage on insects (USFWS 2015). Evidence from recent studies appears to confirm prior observations regarding the association between bat foraging and native limestone forest (USFWS 2015). Breeding of Pacific sheath-tailed bats is timed to coincide with offspring born during the onset of the rainy season when there are predictably greater numbers of insect prey. The Mariana subspecies of the Pacific sheath-tailed bat is now restricted to a single remaining population on the island of Aguiguan (USFWS 2015). Action area is outside current known range. **Not observed during survey.**
Mariana fruit bat *Pteropus mariannus mariannus* **Threatened (ESA)** Endangered (Guam)	**No**	**Marginal roosting and foraging habitat present**	**May affect, but not likely to adversely affect**	The Mariana fruit bat is highly colonial, forming colonies of a few to over 800 animals grouping themselves into harems (1 male and 2 to 15 females) or bachelor groups (predominantly males), or resides as single males on the edge of the colony (USFWS 2005). Mating and the presence of nursing young have been observed year-round on Guam (USFWS 2005). Mariana fruit bats forage and roost primarily in native limestone forest and forage occasionally in coconut (*Cocos nucifera*) groves and strand vegetation (USFWS 2005). Major roost trees included *Ficus* spp. and *Neisosperma* (*Ochrosia*) *oppositifolia* (USFWS 2005). Food items include the fruits of 17 species of plants, especially the native *Artocarpus mariannensis*, *Cycas circinalis*, *Ficus* spp., *Pandanus tectorius*, *Terminalia catappa*, and the introduced *Artocarpus altilis* and *Carica papaya*; the flowers of seven plants, including the native *Ceiba pentandra* and *Erythrina variegata*, and the introduced *Cocos nucifera*; and leaf stems and twig tips of *Artocarpus* spp. (USFWS 2005). Although Mariana fruit

Table 1. (continued)

NAME / STATUS	SPECIES KNOWN IN ACTION AREA	SUITABLE HABITAT PRESENT IN ACTION AREA	EFFECT DETERMINATION[1]	HABITAT NEEDS AND SUITABILITY
Mariana fruit bat (continued)				bats have been observed to feed on and roost in cultivated, introduced food plants, non-native species make up only a small fraction of the plants they use (USFWS 2005). On Guam, the single remaining roost and most fruit bat foraging habitat is found on U.S. military lands (USFWS 2005). The loss of native forest, predation by the brown tree snake, and illegal hunting are the most significant threats to the survival of this species (USFWS 2005). **Not observed during survey.**
Little Mariana fruit bat *Pteropus tokudae* **Endangered (ESA)** Endangered (Guam)	**No**	**Marginal roosting and foraging habitat present**	**No effect**	Mainly inhabited limestone forests, similar to the Mariana fruit bat. The little Mariana fruit bat was endemic to Guam but hasn't been observed since 1968 and is presumed extinct (USFWS 2013). Action area is outside current known range. **Not observed during survey.**
Birds				
Mariana gray swiftlet *Aerodramus vanikorensis bartschi* **Endangered (ESA) MBTA Protected** Endangered (Guam)	**No**	**No roosting habitat present; marginal foraging habitat present**	**No effect**	Small bird with a body size about twice the size of a golf ball (Vogt and Williams 2004). Swiftlets nest and roost in caves and create cup-shaped nests of moss or other plant material glued together with saliva. They leave the caves to forage, mostly over ridge crests and open grassy areas (USFWS 1991). On Guam, predation by brown tree snakes and rats are ongoing mortality factors, with the current population for the island estimated at ~1,400 (USFWS 2018c). **Not observed during survey.**
Micronesian starling *Aplonis opaca guami* Endangered (Guam)	**No**	**Yes**	**May affect, but not likely to adversely affect**	Medium sized bird with black body and wings and yellow eyes. Common in most habitats, sometimes moving in flocks, nests in cavities and feeds on insects, seeds, and fruits (Vogt and Williams 2004). Historically found throughout Guam, now restricted to Cocos Island and Andersen Air Force Base in Northern Guam (Guampedia 2019). Greatly reduced due to the brown tree snake and restricted to urban areas (Vogt and Williams 2004). **Not observed during survey.**

Table 1. (continued)

NAME / STATUS	SPECIES KNOWN IN ACTION AREA	SUITABLE HABITAT PRESENT IN ACTION AREA	EFFECT DETERMINATION[1]	HABITAT NEEDS AND SUITABILITY
Mariana crow *Corvus kubaryi* **Endangered (ESA)** **MBTA Protected** Endangered (Guam)	**No**	**No**	**No effect**	The Mariana crow inhabits native limestone forests. This species is believed to be extirpated from Guam (USFWS 2014). Action area is outside current known range for this species. **Not observed during survey.**
White-throated ground-dove *Gallicolumba xanthonura* **MBTA Protected** Endangered (Guam)	**No**	**Yes**	**No effect**	Secretive bird that can be difficult to see or hear. This species forages on the ground or in trees for seeds and berries (Vogt and Williams 2004). Believed extirpated on Guam due to brown tree snake predation (Vogt and Williams 2004). **Not observed during survey.**
Mariana common moorhen *Gallinula chloropus guami* **Endangered (ESA)** **MBTA Protected** Endangered (Guam)	**No**	**No**	**No effect**	The Mariana common moorhen is a black bird 14 inches (35 cm) in length with a red bill and frontal shield (adults), white undertail coverts, long olive-green legs, and unwebbed feet (USFWS 2019c). The species requires permanent freshwater wetland habitat (USFWS 2018a). **Not observed during survey.**
Guam rail *Gallirallus owstoni* **Endangered (ESA)** **MBTA Protected** Endangered (Guam)	**No**	**Yes**	**No effect**	The Guam rail is extinct in the wild; two experimental populations have been established off of Guam (on Rota and Cocos) where the primary threat of the brown tree snake does not occur (USFWS 2018b). Action area outside current range. **Not observed during survey.**
Micronesian kingfisher *Halcyon cinnamomina cinnamominus* **Endangered (ESA)** **MBTA Protected** Endangered (Guam)	**No**	**Yes**	**No effect**	Prior to its extirpation from the wild, the Micronesian kingfisher was found only on the island of Guam. This species utilized a wide variety of habitats on the island including limestone forest, strand forest, ravine forest, agricultural forest, secondary forest, edge habitats, and forest openings; however, mature forests with appropriate nest sites (cavities in large, dead trees) may be an important component of reproductive activities (USFWS 2008). **Not observed during survey.**

Table 1. (continued)

NAME / STATUS	SPECIES KNOWN IN ACTION AREA	SUITABLE HABITAT PRESENT IN ACTION AREA	EFFECT DETERMINATION[1]	HABITAT NEEDS AND SUITABILITY
Micronesian honeyeater *Myzomela rubratra saffordii* Endangered (Guam)	**No**	**Yes**	**No effect**	The Micronesian honeyeater is a small black and crimson bird that feeds on nectar and insects with a long, downward curved beak (Vogt and Williams 2004). The species is thought to be extirpated on Guam due to predation by brown tree snakes (Vogt and Williams 2004). **Not observed during survey.**
Mariana fruit dove *Ptilinopus roseicapilla* **MBTA Protected** Endangered (Guam)	**No**	**Yes**	**No effect**	The Mariana fruit dove is a colorful but secretive bird that occurs in forest habitats. It is thought to be extirpated on Guam due to predation by brown tree snake (Vogt and Williams 2004). **Not observed during survey.**
Rufous fantail *Rhipidura rufifrons uraniae* Endangered (Guam)	**No**	**Yes**	**No effect**	The Rufous fantail is a small brown bird common in forest habitats. They create cone shaped nests and will often approach people to investigate before retreating into the forest (Vogt and Williams 2004). It is thought to be extirpated on Guam due to predation by brown tree snake (Vogt and Williams 2004). **Not observed during survey.**
Bridled white-eye *Zosterops conspicillata conspicillata* Endangered (Guam)	**No**	**Yes**	**No effect**	Tiny bird often seen in flocks that inhabits forested habitats. It is thought to be extirpated on Guam due to predation by brown tree snake (Vogt and Williams 2004). **Not observed during survey.**
Reptiles				
Snake-eyed skink *Cryptoblepharus poecilopleururs* Endangered (Guam)	**No**	**Yes**	**May affect, but not likely to adversely affect**	The snake-eyed skink is a small skink with varying color patterns from light tan to dark brown, with dark mottling sometimes appearing as stripes or spots (Vogt and Williams 2004). More slender than other skinks; juveniles can be confused with Slevin's skink (below). Generally found near the coast; active on the ground but will climb trees and shrubs (Vogt and Williams 2004). Eyelids are clear and immovable so it does not blink. **Not observed during survey.**

Table 1. (continued)

NAME / STATUS	SPECIES KNOWN IN ACTION AREA	SUITABLE HABITAT PRESENT IN ACTION AREA	EFFECT DETERMINATION[1]	HABITAT NEEDS AND SUITABILITY
Tide-pool skink *Emoia atrocostata* Endangered (Guam)	**No**	**No**	**No effect**	Large robust skink with black and tan mottled coloration. Inhabits the littoral zone, foraging and climbing on rocks and scrub vegetation (Vogt and Williams 2004). **Not observed during survey.**
Azure-tailed skink *Emoia cyanura* Endangered (Guam)	**No**	**Yes**	**May affect, but not likely to adversely affect**	Limited information is available for this species. From Hawai‘i it is known to inhabit dry lowlands and moist wooded areas at higher elevations (NatureServe 2009). **Not observed during survey.**
Slevin’s skink *Emoia slevini* **Endangered (ESA)** Endangered (Guam)	**No**	**Yes**	**No effect**	Slevin’s skink is a small lizard, and is the only species of lizard endemic to the Mariana Islands (USFWS 2015). This species occurs in the forest ecosystem, with most individuals observed on the forest floor using leaf litter as cover. Slevin’s skink previously occurred on the southern Mariana Islands (Guam, Cocos Island, Rota, Tinian, and Aguiguan), where it is now extirpated, except from Cocos Island off Guam where it was recently rediscovered (USFWS 2015). Action area outside current known range. **Not observed during survey.**
Moth skink *Lipinia noctua* Endangered (Guam)	**No**	**Marginal**	**May affect, but not likely to adversely affect**	The moth skink is a small skink (2 inches snout to vent) with brown and tan coloration, and a dark line with light color flecks running down the sides of the body (Vogt and Williams 2004). This species inhabits native forests on the ground or in low levels in the trees, often near *Pandanus* trees. **Not observed during survey.**
Pacific slender-toed gecko *Nactus pelagicus* Endangered (Guam)	**No**	**Marginal**	**May affect, but not likely to adversely affect**	This gecko is grayish in color with dark cross bands and a large head. Toes are slender unlike other species with large toe pads (Vogt and Williams 2004). It is nocturnal, terrestrial, and occurs on rocky terrain. **Not observed during survey.**

Table 1. (continued)

NAME / STATUS	SPECIES KNOWN IN ACTION AREA	SUITABLE HABITAT PRESENT IN ACTION AREA	EFFECT DETERMINATION[1]	HABITAT NEEDS AND SUITABILITY
Micronesian gecko *Perochirus ateles* Endangered (Guam)	**No**	**Marginal**	**May affect, but not likely to adversely affect**	The Micronesian gecko is a large gecko (up to 3.5 inches snout to vent) with a greenish and slightly mottled appearance (Vogt and Williams 2004). The fifth toe on each foot is greatly reduced, giving the appearance of four toes. This species prefers limestone forest, though it has been documented around human structures. **Not observed during survey.**

[1]Effect Determination:

- "May affect, and is likely to adversely affect" means that listed resources are likely to be exposed to the action or its environmental consequences and will respond in a negative manner to exposure.
- "May affect, but not likely to adversely affect" means that all effects are beneficial, insignificant, or discountable. Beneficial effects have contemporaneous positive effects without any adverse effects to the species or habitat. Insignificant effects relate to the size of the impact and include those effects that are undetectable, not measurable, or cannot be evaluated. Discountable effects are those extremely unlikely to occur. These determinations require written concurrence from the Service.
- "No effect" means there will be no impacts, positive or negative, to listed or proposed resources. Generally, this means no listed resources will be exposed to action and its environmental consequences. Concurrence from the Service is not required.

No Mariana eight-spot butterflies or their host plant species were observed. Therefore, the action area does not contain suitable habitat.

Timed area searches did not identify any listed species of tree snails, however live non-native snails, non-native snail shells (possibly depredated), and slug species were observed indicating shade and moisture conditions at the site may be suitable for listed tree snails (Appendix A Table 1-A; Appendix B Photos 5 and 6). A large *Platydemus* species was observed during the nocturnal survey. This species may have been the predatory New Guinea flatworm (*P. manokwari*), however species level identification could not be confirmed by the surveyors (Appendix B Photo 7). The dense cover of coral vine obscured tree trunks and leaf litter within the project area. It is possible that if present, native tree snails may not have been observed during timed area searches and other surveys due to limited visibility of suitable habitats. However, presence is unlikely due to the disturbed nature of the site, presence of non-native (competitor) snail species such as the African giant snail (*Lissachatina fulica*), and possibly predatory flatworms.

No species of mammals were observed during surveys. Preferred native limestone forest roosting habitat and roosting tree species for the Mariana fruit bat are not present, and though some potential forage species are present, the action area is dominated by non-forage species. The marginal secondary growth forest patch habitat is close to the UOG campus and apartment buildings with frequent human disturbances. One juvenile monitor lizard (potential predator) was observed during the nocturnal survey. Though bat species may not have been detected by the surveys, presence is possible but very unlikely due to the current population size and limited distribution on Guam.

Point count and general surveys identified two non-native avian species within the action area: Eurasian tree sparrow (*Passer montanus*) and Philippine turtle-dove (*Streptopelia bitorquata*). No native species of birds were observed. Density and diversity of birds in the action area was extremely limited with only Eurasian tree sparrow being observed in any significant quantity around dumpsters, on power lines, and at the eastern edge of the action area where the forest transitions to open grass. Occasional Philippine turtle-doves passed over the area or were observed perched on power lines. There is potential for special status bird species to pass through the action area.

No federally listed reptiles were observed during the surveys or are expected to occur within the action area. Suitable habitat is present for some Guam-listed species of skinks and geckos, though no listed species were observed during surveys. Two common skink species are present: curious skink (*Carlia fusca*) and Pacific blue-tailed skink (*Emoia caeruleocauda*) (Appendix B Photos 8 and 9, respectively). Vocalizations (chirping) were observed from the upper tree canopy throughout the action area during the nocturnal survey, though no individuals were seen. This was likely a common arboreal gecko species such as the house gecko (*Hemidactylus frenatus*), though this could not be confirmed by the surveyors. There is potential for Guam-listed skinks and geckos to occur within the action area.

4.0 EFFECTS OF THE ACTION

The following effects definitions from 50 CFR §402-02 were utilized and assess the proposed action on listed species and critical habitats:

- Direct Effects: Direct or immediate effects of the project on the species or its habitat. Direct effects include those resulting from interdependent or interrelated actions.
- Indirect Effects: Those effects that are caused by or will result from the proposed action and are later in time, but still reasonably certain to occur.

4.1 Critical Habitat

The proposed action will have **no direct or indirect effects on designated critical habitat** for any listed species (Table 1).

4.2 Plant Species

The proposed action is **not anticipated to have any direct effects on federally listed plant species** (including *Cycas micronesiaca*, *Bulbophyllum guamense*, *Dendrobium guamense*, *Tuberolabium guamense*, and *Nervilia jacksoniae* which were not observed during the floristic survey) (Table 1). Potential indirect effects include conversion of marginal habitat areas to urban land use, thus reducing forest habitat potentially suitable for later restoration for or colonization by listed plant species. This indirect effect is likely insignificant due to the poor quality and fragmentation of the habitat and location within a developed/disturbed landscape.

4.3 Invertebrates

The proposed action is **not anticipated to have any direct effects on the federally listed Mariana eight-spot butterfly**, or indirect effects though habitat loss or modification (Table 1). The site does not support the host plants (*Procris pedunculata* and *Elatostema calcareum*) or habitat suitable for the host plants (limestone karst protected from ungulate browsing) of this species.

The proposed action **may affect but is not likely to adversely affect federally protected tree snails** (humped tree snail, Guam tree snail, and fragile tree snail) (Table 1). The action area is outside the current known range for the protected tree snails, however marginal suitable habitat is present and survey visibility of tree trunks and leaf litter was limited. Potential indirect effects include conversion of marginal habitat areas to urban land use, thus reducing marginally suitable forest habitat. This indirect effect is likely insignificant due to the poor quality and fragmentation of the habitat, location within a developed/disturbed landscape, dominance of non-native vegetation, and presence of potential predators and competing non-native species.

4.4 Mammals

The proposed action **may affect but is not likely to adversely affect the federally listed Mariana fruit bat** (Table 1). The lack of suitable roosting habitat and known occurrences in the action area and adjacent parcels makes direct effects to this species very unlikely. The proposed action may have an indirect negative effect on the species through conversion of potential marginal foraging habitat to urban land use. This indirect effect is likely insignificant due to the poor quality and fragmentation of the habitat, location within a developed landscape with significant human

disturbances, dominance of non-native vegetation, and presence of potential predators (monitor lizards).

4.5 Birds

The proposed action is **not anticipated to have direct or indirect effects on federal ESA- or MBTA-listed bird species** (Table 1).

The proposed action **may affect but is not likely to adversely affect the Guam-listed Micronesian starling** (Table 1). The action area and adjacent parcel contains potentially suitable nesting and foraging habitat, though the species was not observed during surveys. The proposed action may have an indirect negative effect on the species through conversion of potential nesting and foraging habitat to urban land use and increased noise levels during construction. These indirect effects are likely insignificant due to the poor quality and fragmentation of the habitat, location within a developed landscape with currently significant human disturbances, dominance of non-native vegetation, and presence of potential predators (monitor lizards). However, where this species is currently found on Guam is often associated with urban areas and decreased abundance of brown tree snake. Therefore, the location of the site adjacent to human development may make the disturbed habitat currently more suitable than some less disturbed forest areas that may support higher numbers of brown tree snake. Conversion of the secondary forest to urban land use may actually further improve the suitability of the parcel for occupation by the Micronesian starling.

4.6 Reptiles

The proposed action is **not anticipated to have any direct effects on the federally listed Slevin's skink** (Table 1). The proposed action **may affect but is not likely to adversely affect the Guam-listed snake-eyed skink, azure-tailed skink, moth skink, Pacific slender-toed gecko, and Micronesian gecko** (Table 1). No Guam-listed skinks or geckos were identified during the field survey; however, vocalizations were observed from an unseen arboreal gecko species. All skinks observed appeared to be curious skinks or blue-tailed skinks, but not all individuals were observed well enough to definitively identify species due their speed and skittishness. Potential indirect effects to listed skink and gecko species include conversion of suitable habitat areas to urban land use, thus reducing available forest habitat. This indirect effect is likely insignificant due to the poor quality and fragmentation of the habitat, location within a developed/disturbed landscape, dominance of non-native vegetation, and presence of potential predators and competing non-native species.

5.0 Conclusions and Conservation Measures

No ESA, MBTA, or Guam-listed species were observed in the action area. No critical habitat or wetlands occur in the action area. Direct effects are not anticipated to any listed species or their habitat, though in some cases presence cannot be entirely ruled out. The following conservation measures are proposed to avoid and minimize impacts to listed species.

5.1 General Construction Measures

1. Prior to working on the project, all project personnel will attend a pre-construction environmental training to review potential special-status species that could be found in the action area and ensure that conservation measures for the project are understood and implemented. The training should include a

description of the species and their habitat needs; a report of the occurrence of the species in the project area; an explanation of the status of the taxa and its protection under ESA, MBTA, or Guam regulations; a list of measures being taken to reduce impacts to the species during construction; and responsibilities of employees. A fact sheet conveying this information should be prepared for all personnel associated with the project and for anyone else who may enter the site. On completion of training, employees will sign a form stating that they attended the training and understand all the conservation measures.

2. All heavy equipment, vehicles, and construction activities will be confined to the designated action area. The activity footprint and vegetation removal will be minimized as feasible to reduce the potential for impacts to special-status species.
3. Vehicle speeds on unpaved roads will not exceed 15 miles per hour.
4. Trash dumping, firearms, open fires (such as barbecues), hunting, and pets will be prohibited at the work site. All trash and waste items generated by construction or crew activities will be properly contained and removed from the action area.
5. All project personnel will visually check for animals beneath vehicles and equipment immediately prior to operation.
6. The potential for wildlife to seek refuge or shelter in pipes and culverts will be minimized. Any pipes, culverts, or other open-ended materials and equipment stored onsite will be inspected for animals prior to moving, burying, or capping to assure that no animals are present within the materials and equipment. To prevent accidental entrapment of wildlife during construction, all excavated holes, ditches, or trenches greater than one foot deep will be covered at the end of each workday by suitable materials or escape routes will be constructed. After opening and before filling, such holes, ditches, and trenches will be thoroughly inspected for trapped animals.
7. If a special-status species is discovered in the action area, the Project Manager (PM) will be contacted. The PM will report the sighting to the appropriate natural resource agency(ies) (e.g., USFWS, Division of Aquatic and Wildlife Resources [DAWR]) within 24 hours. The animal will be allowed to move off site on its own and/or appropriate work exclusion buffers will be established (Appendix C). Special-status species will not be taken or harassed.
8. Soil will be stockpiled within established work area boundaries and located so as not to enter water bodies, stormwater inlets, or other standing bodies of water. Stockpiled soil will be covered prior to precipitation.
9. Products used for stormwater best management practices (BMPs; if used) with net-like materials (e.g., jute mats, fiber logs, etc.) will be composed of 100% natural material and inspected prior to and after each storm event to ensure they are properly secured to prevent injury to listed species. All perimeter control products must be removed and disposed of properly at the completion of construction and site stabilization.
10. All construction equipment will be well maintained to prevent leaks of fuels, lubricants, or other fluids. All equipment shall be inspected before being brought on site, and daily while on site for leaks.

11. Any stationary equipment containing lubricating oils and fuel (e.g., portable compressor, hydraulic pump, cranes, generators, etc.) will be placed within secondary containment, whenever feasible.
12. A copy of all applicable permits and approvals, with associated maps, conditions, and conservation measures will be kept onsite at all times.

5.2 Pre-construction Survey

A qualified biologist will survey the work area no more than 10 days prior to the start of initial vegetation removal and ground disturbing activities. When a sensitive species is identified, data will be collected as to its identity, location, population size, and population condition. Photos and GPS data will be collected using a hand-held GPS device. The information collected will be reported to the PM and applicable resource agency(ies) (USFWS, DAWR) to evaluate project activities and, if deemed necessary, modify activities to provide adequate resource protection, including establishing species-specific work exclusion buffers (Appendix C). The survey will consist of walking the project limits and within the project site to ascertain the possible presence of listed species. The qualified biologist will investigate all potential areas that would be used by listed species. Focused tree snail surveys will be conducted in accordance with the *Draft Interim Guidelines for Conducting Tree Snail Surveys in the Mariana Islands* (Appendix D; USFWS 2019d).

If listed species are encountered during project construction, all activities which have the potential to result in the harassment, injury, or death of the individual will be immediately halted, and the qualified biologist will be contacted for further direction. To the maximum extent possible, contact with the species will be avoided and it will be allowed to move out of the potentially hazardous situation to a secure location on its own volition. If the species cannot leave the project area on its own, species-specific work exclusion buffers will be established (Appendix C) and the PM and qualified biologist will contact the appropriate agency for further guidance.

5.3 Flagging Sensitive Natural Resources for Avoidance

The qualified biologist will flag any sensitive natural resources identified within the action area to minimize the risk of unintended disturbance. If active bird nests are found, the qualified biologist will notify the PM who will consult with the appropriate resource agency to determine appropriate avoidance buffers; biological monitoring may be needed depending on buffer distances and associated project activities. If special-status plant species are incidentally observed in the project area, individuals will be marked with flagging or construction fencing and avoided during construction activities. Depending on the species, buffer zones around the plants may be established to avoid effects on special-status plants (Appendix C). If plants are observed, environmental training for construction personnel will include identification and location of special-status plants.

Uniquely-colored tapes will be used for flagging sensitive resources and for marking the boundaries of ecologically sensitive areas such as bird nest buffers. All personnel entering the work sites will be asked to stay out of the flagged environmentally sensitive areas while conducting field activities.

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APPENDIX A: SPECIES OBSERVED DURING FIELD SURVEY

Table 1-A: Wildlife Species Observed During Surveys

COMMON NAME	SPECIES
Invertebrates	
Insects	
Gulf fritillary	*Agraulis vanillae*
Grass bagworm	*Brachycyttarus* sp.
Monarch butterfly	*Danaus plexippus*
Blue-banded king crow	*Euploea eunice*
Giant Asian mantis	*Hierodula patellifera*
Common Mormon swallowtail	*Papilio polytes*
Scarab beetle	*Protaetia* sp.
Guam boonie bee	*Ropalidia marginata*
Rusty millipede	*Trigoniulus corallinus*
Arachnids	
Banana spider	*Argiope appensa*
Crustaceans	
Hermit crab	*Coenobita* sp.
Mollusks	
Lined tree snail (live snails)	*Drymaeus multilineatus*
African giant snail (shells only)	*Lissachatina fulica*
No common name (live snails and shells)	*Satsuma succincta/Satsuma mercatoria*
Leatherleaf slug	Family Veronicellidae
Planarians	
Flat worm	*Platydemus* sp. (possibly *P. manokwari*)
Reptiles	
Curious skink	*Carlia fusca*
Pacific blue-tailed skink	*Emoia caeruleocauda*
Unknown gecko	Family Gekkonidae
Monitor lizard	*Varanus indicus*
Birds	
Domestic chicken (vocalizations from adjacent parcels)	*Gallus gallus domesticus*
Eurasian tree sparrow	*Passer montanus*
Philippine turtle-dove	*Streptopelia bitorquata*

Table 1-B: Plant Species Observed During Surveys

FAMILY	SPECIES*	COMMON NAME*
Ferns and Fern Allies		
Aspleniaceae	***Asplenium nidus***	**bird's nest fern**
Lomariopsidaceae	***Nephrolepis* sp.**	**sword fern**
Polypodiaceae	***Polypodium scolopendria***	**monarch fern**
Polypodiaceae	***Pyrrosia lanceolata***	**tongue fern**
Dicots		
Asteraceae	*Bidens alba*	beggars tick
Caricaceae	***Carica papaya***	**pawpaw**
Convolvulaceae	*Ipomoea* sp.	morning glory
Crassulaceae	*Kalanchoe pinnata*	cathedral bells
Euphorbiaceae	*Euphorbia heterophylla*	yellow spurge
Euphorbiaceae	*Euphorbia hirta*	asthma-plant
Euphorbiaceae	*Euphorbia prostrata*	prostrate sandmat
Fabaceae	*Delonix regia*	flame tree
Fabaceae	*Leucaena leucocephala*	tangantangan
Fabaceae	*Senna occidentalis*	coffee senna
Lamiaceae	***Premna serratifolia***	**false elder**
Malvaceae	*Ceiba pentandra*	kapok tree
Malvaceae	***Thespesia populnea***	**rosewood**
Malvaceae	*Hibiscus rosa-sinensis*	Chinese hibiscus
Meliaceae	*Cedrela odorata*	Spanish cedar
Moringaceae	*Moringa oleifera*	drumstick tree
Nyctaginaceae	*Bougainvillea sp.*	bougainvillea
Passifloraceae	*Passiflora foetida*	stinking passionflower
Passifloraceae	*Passiflora suberosa*	indigo berry
Passifloraceae	*Turnera ulmifolia*	yellow alder
Polygonaceae	*Antigonon leptopus*	coral vine
Rhamnaceae	***Colubrina asiatica***	**latherleaf**
Rubiaceae	***Morinda citrifolia***	**noni**
Rubiaceae	***Aidia cochinchinensis***	**sumak**
Rutaceae	*Citrus* sp.	citrus
Rutaceae	*Triphasia trifolia*	limeberry
Sapindaceae	*Cardiospermum halicacabum*	balloon vine
Verbenaceae	*Stachytarpheta jamaicensis*	nettle leaved vervain

Table 1-B. (continued)

FAMILY	SPECIES*	COMMON NAME*
Monocots		
Araceae	***Epipremnum aureum***	**devil's ivy**
Araceae	*Syngonium angustatum*	arrowhead vine
Arecaceae	***Cocos nucifera***	**coconut palm**
Asparagaceae	***Cordyline fruticosa***	**ti plant**
Asparagaceae	*Sansevieria trifasciata*	snake plant
Commelinaceae	*Tradescantia spathacea*	oyster plant
Flagellariaceae	***Flagellaria indica***	**flagellaria**
Pandanaceae	***Pandanus tectorius***	**pandanus**
Poaceae	*Digitaria sanguinalis*	crab grass
Poaceae	*Eleusine indica*	goose grass
Poaceae	*Panicum maximum*	Guinea grass
Poaceae	*Paspalum paniculatum*	Russell river grass

* Bold font indicates species believed to be native or naturalized. Other species are believed to be more recent introductions.

APPENDIX B: REPRESENTATIVE SITE PHOTOS

Photo 1: Eastern edge of action area, looking northwest. Tangantangan secondary forest stand with non-native edge species including beggars tick (*Bidens alba*), Guinea grass (*Panicum maximum*), and other non-native grasses.

Photo 2: Western interior of action area. Canopy of Spanish cedar with dense growth of coral vine.

Photo 3: Interior location within eastern portion of tangantangan forest.

Photo 4: Interior location dominated by Spanish cedar with noni understory.

Photo 5: *Satsuma succincta/Satsuma mercatoria*, observed throughout the action area.

Photo 6: Lined tree snail, observed in areas along eastern edge of forested habitat.

Photo 7: *Platydemus* species observed in tree during nocturnal survey.

Photo 8: Curious skink (four toes on front foot evident).

Photo 9: Blue-tailed skink.

APPENDIX C: WORK EXCLUSION BUFFER ZONES

The following work exclusion buffer distances shall be implemented to minimize the potential for physical injury or disturbance to listed wildlife (Buffer Distances DRAFT, Dawn Bruns October 10, 2019):

<table>
<tr><th colspan="6">Threatened and Endangered Species Work Exclusion Buffer Zones</th></tr>
<tr><th rowspan="3">Activity</th><th colspan="5">Buffer Distances</th></tr>
<tr><th colspan="2">Listed Plants and Insect Host Plants</th><th rowspan="2">Listed Tree Snails</th><th colspan="2">Mariana Fruit Bat, Mariana Crow, and Rota White-Eye</th></tr>
<tr><th>Listed Herbs, Shrubs, and Terrestrial Orchids and Host Plants for Listed Butterfly</th><th>Listed Trees and Arboreal Orchids</th><th>Listed Birds and Mariana Fruit Bat Maternal Colony*</th><th>Other Bat Colonies and Foraging Solitary Bats</th></tr>
<tr><td>Human presence including walking, vegetation trimming using hand tools, fence installation</td><td colspan="2">3 ft (1 m)</td><td rowspan="4">Buffer to be established and maintained after tree snail locations detected: avoid activity within canopy tree height-distance of tree snail when activity is conducted within 90 days of survey date; use 200 ft (61 m) buffer around tree snails when activity occurs >90 days after snail survey</td><td rowspan="4">Avoid activity within 820 ft (250 m)</td><td rowspan="4">Avoid activity 656 feet (200 meters) upwind from the bat's location and avoid activity 492 ft (150 m) in any other direction</td></tr>
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</table>

* Maternal Colony is Occupied at Night by a Non-Volent Bat Pup: If a bat day roost occurs within 250 meters (820 feet) of the area where activity is proposed, a thermal imaging device should be used in the evening to watch the bat(s) depart for nighttime foraging. If any bat remains at the roost after the bats depart it is likely to be a dependent bat pup, and human activity should be restricted to distances greater than 820 ft (250 m) from the vulnerable bat pup.

APPENDIX D: TREE SNAIL SURVEY GUIDELINES

DRAFT Interim Guidelines for Conducting Tree Snail Surveys in the Mariana Islands

US Fish and Wildlife Service Pacific Islands Fish and Wildlife Office
August 18, 2019: Updates in progress based on input from snail experts

The US Fish and Wildlife Service Pacific Islands Fish and Wildlife Office recommends the following interim guidelines and protocols be used to conduct and report surveys for tree snails listed as endangered under the U.S. Endangered Species Act (ESA) in the Mariana Islands. The species, in the Family Partulidae, include the Guam tree snail (*Partula radiolata*), which is only found on Guam, as well as the humped tree snail (*Partula gibba*) and fragile tree snail (*Samoana fragilis*), which both occur on Guam and the Commonwealth of the Mariana Islands (CNMI). The three species were listed as endangered on October 1, 2015 (80 FR 59423). Tree snails may occur in native and non-native shrubs, vines, and trees, and on the ground under these types of vegetation.

Tree Snail Life History: Vertical distribution of *Partula* species is likely to vary by species, snail age, and moisture as it does on Moorea, French Polynesia (Murray et al 1982). Surveys at Asan Memorial Park, Guam, indicated most *P. radiolata* were situated in vegetation above a height of 9.8 feet (ft) (three meters (m)) and average tree snail height ranged from 4.9 to 12.8 ft (1.5 to 3.9 m); *S. fragilis* and *P. radiolata* occurred at similar heights at Lost Pond (Fiedler 2018). *Partula radiolata* were measured up as high as 29.5 ft (nine m) on a breadfruit tree and one *S. fragilis* was detected at 45.9 ft (14 m) on Rota (Fiedler 2018). *Partula gibba* occur in the sub-canopy of shaded mixed native forests with good understory and ground cover (Crampton 1925; Cowie 1992; Hopper and Smith 1992; Smith 1995; Smith et al. 2008; Hadfield 2010). Tree snails are generally nocturnal, living on bushes or trees and feeding primarily on senescent or decaying plant material. An estimated one to two percent of tree snails may be on the ground at a given time (Fiedler, in litt. 2018, and Janeke, in litt. 2018). Tree snails are injured or killed by predators including the alien carnivorous flatworm (i.e. manokwari flatworm (*Platydemus manokwari*), predatory snails (i.e. rosy wolf snail (*Euglandina rosea*) and *Gonaxis* spp.) and rodents (particularly rat (*Rattus* spp.)) (Hadfield et al 1993, Hadfield and Saufler 2009). Additional threats to tree snails include feral ungulate trampling and habitat loss due to ungulates, wildfire, forest clearing for development, fugitive dust, and invasion by introduced weed species.

Risks common to human activity include permanent habitat loss or degradation due to land clearing, spread of invasive species (including increased conversion of native forest to grassland due to wildfire), physical injury to wildlife due to crushing or trampling, reduced survival or reproduction due to noise or other disturbance (including wildlife poaching or collection), flight hazards, and toxicant effects. Tree snails are known to fall when the leaf they are adhered to is dislodged from the tree or when, under stronger wind conditions such as a typhoon, the leaves or branches they are occupying are torn from the tree (Fiedler, 2018). Risks often decrease with

distance from the project footprint. The tree snail field investigators should incorporate the following protocols:

1. Survey Area: Delineate the perimeter of the tree snail survey area using a hand held Global Positioning System (GPS) unit or GIS ArcMap. The survey area should include the entire project "action area" where the project will result in increased threats to these animals, in addition to the appropriate tree snail dispersal buffer distances. The action area perimeter should be based on the maximum reach of project-related stressors (including the project footprint and areas outside the project footprint where disturbance, microclimate, or other habitat modification may adversely affect tree snails as a result of the proposed action). Based on the tree snail biology and dispersal information we have on hand, we recommend the tree snail survey buffer distance should be 33 feet (10 meters) or the height of the vegetation canopy (whichever is greater), when project activities will occur within three months of tree snail surveys. If tree snail surveys will occur more than three months in advance of project implementation, it will be important to use a wider buffer (such as 200 feet (61 meters)) to accommodate tree snail dispersal (Hall and Hadfield 2009). Exclude from survey areas habitat that is not suitable for tree snails, such as developed, landscaped, savanna and cultivated areas. **A Note Regarding Adverse Survey Conditions:** Adverse conditions may prevent investigators from determining presence or identifying some target species in potential habitat. Disease, drought, or predation may preclude the presence or identification of target species in any year or foul weather conditions may reduce tree snail visibility. Do not conduct tree snail surveys when adverse conditions occur. If surveys are conducted during adverse conditions, repeat the survey.

2. Transects: Survey for tree snails using a grid of transects overlaying the tree snail survey area. Set transect width based on vegetation height and density so that all vegetation can be observed using high-power binoculars. Report GPS survey track routes.

3. Survey Points: Tree snail surveys should be conducted by a minimum of two qualified biologists who are experienced and familiar with tree snails, working in tandem. Biologists should conduct visual surveys at points along the transects. Spacing between survey points should be based on the height and density of vegetation such that all vegetation can be observed.

4. Visual Surveys at Survey Points to Determine Presence/Absence: At each survey point, inspect leaves and branches of broad-leafed species for five minutes per person, and examine leaf litter for 30 minutes for live tree snails, empty shells of *Partula* species, and the *Platydemus* and *Euglandina* (Hopper & Smith 1992). At each survey point, continuously scan the radius around the survey point to the top of the canopy. Tree snails are generalists in terms of host plants, and any species with broad, smooth leaves are potential hosts; therefore, focus searches on plants with these features. Although atypical, the search for snails should also include vines (such as *Syngonium angustatum*) and narrow-leaved species (e.g., *Dracaena marginata*,

Miscanthus floridulus and *Leucaena leucocephala*) which may also provide habitat. Search ventral and dorsal surfaces of host plants either manually or with binoculars. Recording detections of fresh and old shells found. If no live snails or fresh ground shells are found during the timed search, document that no tree snails were detected. If live snails or fresh ground shells are found, consider the site to be occupied by tree snails.

5. When a Live Tree Snail or Fresh Shell is Detected, Thoroughly Assess the Boundary of the Occupied Area: When a live tree snail is detected at a survey point during the 30-minute visual census period, identify the extent of the area occupied by tree snails by searching outward from the quadrat until observers are no longer able to find live snails or fresh shells. The main objective is to delineate the boundaries of the tree snail colony. When a live tree snail is detected, record the following information:

a. description of the biological setting, including plant community, topography, soils, vegetation type, current and historic land uses of the habitat(s) and degree of site alteration;

b. an assessment of the biological significance or ecological quality of the project site in a local and regional context;

c. a GPS location;

d. time of day and current local weather conditions including time since last rain, relative humidity, and whether the substrate the snail is on is wet or dry;

e. identify any threats to the tree snail population such as presence of *Platydemus*, and *Euglandina* (quantify if possible within a 1 m^2 quadrat), other predation threats, ungulate habitat damage, and wildfire threat. Because *Platydemus* and *Euglandina* are unlikely to be detected during dry conditions, surveyors should check moist habitats (leaf litter, under logs) for these species since their presence constitutes a real threat to any *Partula* present;

f. presence of tree snail occurrences off-site on adjacent parcels, if known.

6. Mark off the area occupied by tree snails with flagging: The flagging is important to enable the project proponent to install permanent "no activity" buffer markers around the tree snail colony or to implement future tree snail conservation measures;

7. When the Proposed Project Can't Be Modified to Avoid Increased Risks to Tree Snails, Assess Tree Snail Numbers: Search a diameter of at least 26 feet (eight meters) (588 square feet (50 m2) centered on the trunk of the host plant where a tree snail was detected for one person-hour, noting the species of snail found, number of individuals found, and what plant or substrate found on (Smith et al. 2008). One person-hour can be divided by the number of individuals searching to keep a standard search effort to infer population size (e.g. if four individuals search, each occupies a quarter of the quadrat and searches for 15 minutes. Identify snails found during this timed search to species when possible, photograph and record GPS coordinates. Record the following information:

a. an assessment of tree snail density and an estimate of the number of individuals of each tree snail species within each occupied area. Document the dominant host plant where snails are found (if that exists). Document the percentage of snails on each host plant species (in some cases, 80% of the tree snails in a colony occurred on one particular tree species);

b. Investigators could provide color slides, photos or color copies of photos of target species or representative habitats to support information or descriptions contained in reports;

b. if the stressors will be restricted to the understory area, such as hiking or disturbance to understory vegetation, assess the percentage of tree snails found on the ground and in the vegetation at or below a height of six feet to inform trampling risk;

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Federal Register Documents:

80 FR 59423-59497 Endangered and Threatened Wildlife and Plants; Endangered Status for 16 Species and Threatened Status for 7 Species in Micronesia; Final Rule, Federal Register / Vol. 80, No. 190 (Thursday, October 1, 2015) Rules and Regulations

United States Department of the Interior

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

In Reply Refer To:
01EPIF00-2020-SL-0079

Ms. Jessica Walsh
Project Manager
Myounghee Noh & Associates, L.L.C.
200 Kohola Street
Hilo, Hawaii 96720

Subject: University of Guam Cultural Repository Facility at Lot 5372-3A, Mangilao, Guam

Dear Ms. Walsh:

We have reviewed your November 7, 2019, request for our concurrence with your determination that the proposed construction and operation of the University of Guam Cultural Repository Facility at Lot 5372-3A, Mangilao, Guam, may affect but is not likely to adversely affect the threatened Mariana fruit bat (fanihi, *Pteropus mariannus mariannus*), the endangered Slevin's skink (*Emoia slevini*), and three endangered tree snails (humped tree snail (akaleha', *Partula gibba*), Guam tree snail (akaleha', *Partula radiolata*), and fragile tree snail (akaleha', *Samoana fragilis*) (tree snails), pursuant to the Endangered Species Act of 1973 as amended (16 U.S.C. 1531 *et seq*.) (ESA).

On October 29, 2019, the U.S. Department of Defense Office of Economic Adjustment designated the University of Guam to be their designated non-federal representative for the purposes of completing this informal consultation with the U.S. Fish and Wildlife Service pursuant to the ESA. October 23, 2019, Sonny P. Perez, University of Guam Capital Projects Manager designated Myounghee Noh & Associates, L.L.C. to represent the University of Guam to complete this ESA section 7 informal consultation.

Description of the Proposed Action

The proposed action entails construction and operation of a 13,000-square foot building to house a cultural repository facility for artifacts and ancestral remains found during off-site military construction activities. Construction of the cultural repository facility will include site clearing and grading, utility connections, access roads and parking, grading for site drainage, and installation of security fencing. Conservation measures have been incorporated into the project to minimize the potential for the project to adversely affect threatened and endangered species.

Conservation Measures: To reduce the potential for the project to adversely affect listed wildlife, vegetation removal and other construction activities will not occur in the vicinity of

threatened and endangered species as detailed in the November 7, 2019, Biological Assessment for the University of Guam Cultural Repository Facility, Lot 5372-3A, Maga, Municipality of Mangilao, Guam. Surveys for listed plants and vertebrates have been conducted and tree snail surveys will be conducted in accordance with the U.S. Fish and Wildlife Service's August 18, 2019, Draft Interim Guidelines for Conducting Tree Snail Surveys in the Mariana Islands.

Work exclusion buffer zones detailed in Table 1 will be established and maintained around listed wildlife. If a tree snail is detected, a work exclusion buffer zone equal to the height of the tree canopy (or, if surveys are conducted more than 90 days prior to the construction activity, 200 feet (61 meters)) will be established and maintained to avoid adverse project effects to the tree snail. To avoid disturbance of Mariana fruit bats, construction work will temporarily cease if a Mariana fruit bat maternal colony occurs within 820 feet of the project or of a Mariana fruit bat occurs 656 feet downwind (or 492 feet in any other direction) from the construction activity.

Table 1. Mariana Islands Work Exclusion Buffer Zones.

<table>
<tr><th colspan="6">Threatened and Endangered Species Work Exclusion Buffer Zones</th></tr>
<tr><th rowspan="3">Activity</th><th colspan="5">Buffer Distances</th></tr>
<tr><th colspan="2">Listed Plants and Insect Host Plants</th><th rowspan="2">Listed Tree Snails</th><th colspan="2">Mariana Fruit Bat, Mariana Crow, and Rota White-Eye</th></tr>
<tr><th>Listed Herbs, Shrubs, and Terrestrial Orchids and Host Plants for Listed Butterfly</th><th>Listed Trees and Arboreal Orchids</th><th>Listed Birds and Mariana Fruit Bat Maternal Colony*</th><th>Other Bat Colonies and Foraging Solitary Bats</th></tr>
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<tr><td>Permanent vegetation clearing</td><td colspan="5">Avoid clearing vegetation within a distance three times the height of the tree canopy from listed plants and animals</td></tr>
</table>

* Maternal Colony is Occupied at Night by a Non-Volent Bat Pup: If a bat day roost occurs within 250 meters (820 feet) of the area where activity is proposed, a thermal imaging device should be used in the evening to watch the bat(s) depart for nighttime foraging. If any bat remains at the roost after the bats depart it is likely to be a dependent bat pup, and human activity should be restricted to distances greater than 820 ft (250 m) from the vulnerable bat pup.

Effects of the Action

Mariana fruit bat: Although no Mariana fruit bat colonies currently occur in the vicinity of the project site, there is a potential for one or more Mariana fruit bats to move into the area during project implementation. The nocturnal colonial tree-roosting Mariana fruit bat forages at night and roosts in trees during the day. Because this bat is sensitive to human scent, activity, and noise, construction activities have the potential to disturb the animal. The Mariana fruit bat pup is likely to be particularly vulnerable to disturbance of its roost site during the period when the bat pup stays at the roost while the rest of the colony is out foraging. This occurs when the bat pup has grown too large for the mother bat to carry on her nighttime foraging trips, and the pup is not yet well-developed enough to participate in the night-time flights.

Because construction activity will not occur near a Mariana fruit bat maternal colony, any Mariana fruit bat mother that may occur in the vicinity of the project site would not be expected to be deterred from continuing to provision for and maintain the bat pup in response to the project. Because of the project's implementation of measures to avoid impacts to the bats as described above, it is not probable any adverse effects will occur. Because adverse effects are not probable, they are discountable and therefore not likely to adversely affect the Mariana fruit bat.

Slevin's skink: The Slevin's skink is not known to currently occur in the vicinity of the proposed action. Therefore adverse effects to the Slevin's skink are extremely unlikely to occur as a result of the proposed action, they are discountable and therefore the project is not likely to adversely affect the Slevin's skink.

Tree snails: The vegetation in the project area may be occupied by one or all three endangered tree snail species that are vulnerable to being crushed during vegetation clearing and earthmoving activities. To minimize the potential for a tree snail to be affected by the construction activity, the project site will be surveyed for tree snails using survey methodology recommended by the Service and, if a tree snail is detected, no vegetation removal or earthmoving activity will occur within a work exclusion buffer zone around the tree snail. Because construction activity will not occur near any endangered tree snail, the proposed activities are extremely unlikely to injure or kill a listed tree snail. Because adverse project effects to these listed tree snails are not probable, they are discountable and therefore the project is not likely to adversely affect listed tree snails.

Conclusion

Based on the proposed action's incorporation of avoidance and minimization measures and the information in our records, our analysis indicates potential impacts of the proposed action, to the Mariana fruit bat, Slevin's skink, and three tree snails (humped tree snail, Guam tree snail, and Fragile tree snail) are discountable as described above. The Service therefore concurs with your determination that the construction and operation of the University of Guam Cultural Repository Facility may affect, but is not likely to adversely affect these species.

Unless the project description changes, or new information reveals that the proposed project may affect listed species in a manner or to an extent not considered, or a new species is listed or critical habitat designated that may be affected by the proposed action, no further action pursuant to section 7 of the ESA is necessary. Reinitiation of this section 7 consultation would be

anticipated if a tree snail is detected and construction activity within the tree snail work exclusion buffer would be unavoidable.

Thank you for participating with us in the protection of our endangered species. If you have any further questions or concerns regarding this consultation, please contact Dawn Bruns, Fish and Wildlife Biologist, 808-792-9469, e-mail: dawn_bruns@fws.gov. Official correspondence relating to this project or future projects can be sent directly to pifwo_admin@fws.gov. When referring to this project, please include these reference numbers: ***01EPIF00-2020-I-0044.***

Sincerely,

JACQUELINE FLORES
Digitally signed by JACQUELINE FLORES
Date: 2019.12.12 10:43:32 +10'00'

Jacqueline Flores
Island Team Manager Mariana Islands

APPENDIX C

NHPA Section 106 Compliance Documentation

Date	Letter	Sent by	Received by	Note
02-24-2020	Determination Letter	UOG	SHPO	--
03-04-2020	Concurrence on Determination	SHPO	UOG	Stipulations included
03-05-2020	Confirmation of Concurrence on Determination	UOG	SHPO	

UNIVERSITY OF GUAM
UNIBETSEDÅT GUÅHAN

Office of the Vice President for
Administration and Finance
FACILITIES MANAGEMENT AND SERVICES

February 24, 2020

Patrick Lujan
Guam State Historic Preservation Officer
Guam Historic Resources Division
State Historic Preservation Office
Department of Parks and Recreation
490 Chalan Palasyo
Agana Heights, Guam 96910

Dear Mr. Lujan:

Subject: Request for Concurrence on No Adverse Effect - University of Guam Cultural Repository Facility, Lot 5372-3A, Maga, Municipality of Mangilao, Guam Guam SHPO Ref. No. RC2011-0782

The University of Guam (UOG), on behalf of the U.S. Department of Defense Office of Economic Adjustment (OEA), requests the Guam State Historic Preservation Office (SHPO) concurrence under Section 106 of the National Historic Preservation Act (NHPA) that the UOG Cultural Repository Facility Project, an undertaking in accordance with 36 CFR 800.3 will have no adverse effect to the site, (66-01-2973), documented to be within the project boundaries, due to the following stipulations:

Archaeological, Cultural, and Historical Resources Protection Stipulations

- No work from this project is permitted to occur outside of the Area of Potential Effect (APE) for this project, as documented on project plans. Contractor laydown areas must be included in the APE, or may be situated on a UOG property that has been previously cleared. Land within the lot, but outside of the APE boundary, has not been surveyed for archaeological resources and cannot be cleared for construction under this project.

- The Contractor is required to hire the services of an archaeologist who meets the Secretary of the Interior's Professional Qualifications Standards for Archaeology and is listed on the Guam Historic Preservation Division's list of qualified archaeological firms. A Certificate of Approval will be issued to the Contractor to hire and archaeologist before the permitting process.

- The SHPO requires an Archaeological Monitoring and Discovery Plan (AMDP), for ground disturbance within the APE. Draft and final archaeological monitoring reports are required and will require SHPO review and approval. SHPO review time is 30 calendar days. The SHPO will issue a letter of acceptance for an approved final report. All Guam SHPO Reporting Guidelines must be followed. The Contractor will be responsible for all deliverables to the SHPO in accordance with the Guam Reporting Guidelines for Archaeological Surveys and is responsible for the archaeologist following the Guam Reporting Guidelines.

Facilities Management and Services

SUBJECT: Request for Concurrence on No Adverse Effect - University of Guam Cultural Repository Facility, Lot 5372-3A, Maga, Municipality of Mangilao, Guam Guam SHPO Ref. No. RC2011-0782

- The APE contains at least one known site (66-01-2973), as documented on project plans, that will need to be uncovered, mapped out and assessed for significance by the archaeologist. In order to do this, the entire site will be uncovered and mapped out before the assessment can be made.

- A Secretary of the Interior qualified archaeologist must be on site during initial clearing, grubbing, and grading to monitor disturbance for archaeological resources. Other sites might be found during the course of the clearing of the lot and the entire APE will need to be monitored for historic properties. Vegetation associated with a home is also located within the property, therefore, this area needs to be closely monitored for features. Any data recovery and mitigation may be required and will be addressed to complete the undertaking.

- In the event of discoveries of archaeological, historical, or cultural resources during excavation, construction work at the site of the discovery shall cease and the Contractor shall immediately notify the Project Engineer. The Project Engineer shall notify Guam SHPO as soon as practical.

- Construction work away from the discovery site may continue. Construction work at the discovery site shall not recommence until the Guam SHPO issues clearance to continue excavation. The contractor must coordinate with the archaeologist to secure the area and prevent employees or other persons from trespassing on, removing, or otherwise disturbing such resources.

- The Contractor and/or Subcontractor shall not claim monetary compensation for any delay of work as a result of any unforeseen archaeological site discovered during construction. Time extension may be granted to the Contractor for such delays resulting from discovery of historic resources in the project, so long as the delay adversely affects the critical path and the delay is in excess of three days.

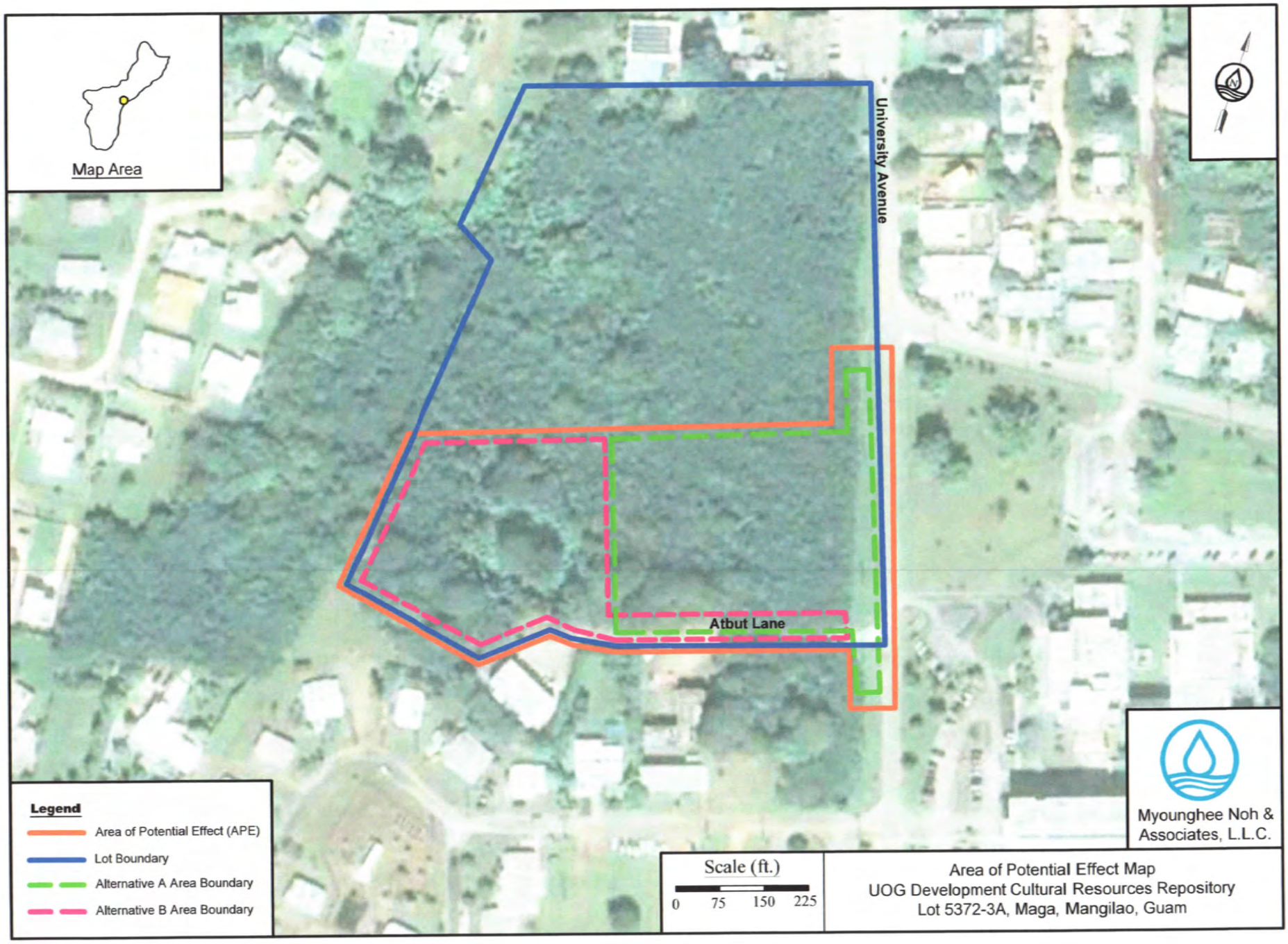
We appreciate working with you on the protection of cultural resources during construction of the Cultural Repository Facility.

Please feel free to contact me if there are any questions at 735-2375 or 688-6627. I may also be reached by e-mail at dsokada@triton.uog.edu.

Si Yu'os Ma'åse,

David S. Okada

David S. Okada
Chief Planning Officer/Interim Chief of Staff and Board Liaison/
Interim Director, Facilities Management and Services


Map Area
University Avenue
Atbut Lane
Legend
Area of Potential Effect (APE)
Lot Boundary
Alternative A Area Boundary
Alternative B Area Boundary
Scale (ft.)
0 75 150 225
Myounghee Noh & Associates, L.L.C.
Area of Potential Effect Map
UOG Development Cultural Resources Repository
Lot 5372-3A, Maga, Mangilao, Guam

Lourdes A. Leon Guerrero
Governor
Joshua F. Tenorio
Lt. Governor

Department of Parks and Recreation
Dipattamenton Plaset yan Dibuetsion
Government of Guam
Director's Office, Parks and Recreation Divisions:
#1 Paseo de Susana, Hagåtña, Guam 96910
P.O Box 2950, Hagåtña, Guam 96932
(671) 475-6288; Facsimile (671) 477-0997
Guam Historic Resources Division:
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(671) 475-6294/6355; Facsimile (671) 477-2822

Jesse G. Garcia
Acting Director
Victor R. Villagomez
Deputy Director

In reply refer to:
2011-0782

March 4, 2020

David S. Okada
Chief Planning Officer, etc.
Office of the Vice President
Administration and Finance
Facilities Management and Services

Subject: Request for Concurrence on No Adverse Effect – University of Guam Cultural Repository Facility Lot 5372-3A, Maga, Municipality of Mangilao, Guam

Dear Mr. Okada,

We have reviewed your No Adverse Effect determination with the stipulations and we can concur with the determination and stipulation with the following conditions added.

1. The assessment of the site will need to be presented to the SHPO for concurrence and any non-concurrence will be mitigated through data recovery and other type of mitigation in consultation with the SHPO. Avoidance would be our number one choice.

2. If there are any findings the SHPO and the State Archaeologist will be notified within 24 hours and the archaeologist will direct the clearing as to not damage the site during clearing. A 20-meter buffer zone will be placed around the known site and any new site until such time as it has been assessed and concurred upon by the SHPO in writing.

With these additions to the aforementioned stipulations we can concur with the No Adverse Effect determination. If you are in agreement, please send us a response as soon as possible. We noted the two different alternatives laid out on the map provided and we look forward to working with you to avoid the known site, if possible.

Sincerely,

Jesse G. Garcia
Acting Director

Patrick Q. Lujan
State Historic Preservation Officer

UNIVERSITY OF GUAM
UNIBETSEDÅT GUÅHAN

OFFICE OF THE PRESIDENT

March 6, 2020

Patrick Lujan
Guam State Historic Preservation Officer
Guam Historic Resources Division
State Historic Preservation Office
Department of Parks and Recreation
490 Chalan Palasyo
Agana Heights, Guam 96910

Subject: Confirmation of Concurrence on No Adverse Effect - University of Guam Cultural Repository Facility, Lot 5372-3A, Maga, Municipality of Mangilao, Guam, Guam
SHPO Ref. No. RC2011-0782

Dear Mr. Lujan:

We have received your concurrence letter (dated March 4, 2020). We are in agreement with the additional stipulations and have incorporated them into the project record and contractor documents. The stipulations are as follows:

- No work from this project is permitted to occur outside of the APE for this project, as documented on project plans. Contractor laydown areas must be included in the APE, or may be situated on a UOG property that has been previously cleared. Land within the lot, but outside of the APE boundary, has not been surveyed for archaeological resources and cannot be cleared for construction under this project.

- The Contractor is required to hire the services of an archaeologist who meets the Secretary of the Interior's Professional Qualifications Standards for Archaeology and is listed on the Guam Historic Preservation Division's list of qualified archaeological firms. A Certificate of Approval will be issued to the Contractor to hire an archaeologist before the permitting process.

- The SHPO requires an Archaeological Monitoring and Discovery Plan (AMDP), for ground disturbance within the APE. Draft and final archaeological monitoring reports are required and will require SHPO review and approval. SHPO review time is 30 calendar days. The SHPO will issue a letter of acceptance for an approved final report. All Guam SHPO Reporting Guidelines must be followed. The Contractor will be responsible for all deliverables to the SHPO in accordance with the Guam Reporting Guidelines for Archaeological Surveys and is responsible for the archaeologist following the Guam Reporting Guidelines.

- The APE contains at least one known site (GHPI 66-01-2973), as documented on project plans, that will need to be uncovered, mapped out and assessed for significance by the archaeologist. In order to do this, the entire site will be uncovered and mapped out before the assessment can be made.

- A Secretary of the Interior qualified archaeologist must be on site during initial clearing, grubbing, and grading to monitor disturbance for archaeological resources. Other sites might be found during the course of the clearing of the lot and the entire APE will need to be

monitored for historic properties. Vegetation associated with a home is also located within the property, therefore, this area needs to be closely monitored for features. Any data recovery and mitigation may be required and will be addressed to complete the undertaking.

- In the event of discoveries of archaeological, historical, or cultural resources during excavation, construction work at the site of the discovery shall cease and the Contractor shall notify the Project Engineer. The Project Engineer shall notify Guam SHPO as soon as practical.

- Construction work away from the discovery site may continue. Construction work at the discovery site shall not recommence until the Guam SHPO issues clearance to continue excavation. The Contractor must coordinate with the archaeologist to secure the area and prevent employees or other persons from trespassing on, removing, or otherwise disturbing such resources.

- The Contractor and/or Subcontractor shall not claim monetary compensation for any delay of work as a result of any unforeseen archaeological site discovered during construction. Time extension may be granted to the Contractor for such delays resulting from discovery of historic resources in the project, so long as the delay adversely affects the critical path and the delay is in excess of three days.

- The assessment of the site will need to be presented to the SHPO for concurrence and any non-concurrence will be mitigated through data recovery and other type of mitigation in consultation with the SHPO. Avoidance of archaeological and historical resources is preferred.

- If there are any findings the SHPO and State Archaeologist will be notified within 24 hours and the archaeologist will direct the clearing as to not damage the site during clearing. A 20-meter buffer zone will be placed around the known site and any new site until such time as it has been assessed and concurred upon by the SHPO in writing.

As the project design progresses, we intend to work toward avoiding known resources at the project site. We look forward to continued coordination with Guam SHPO to protect cultural and historic resources during the implementation of this project.

If you have questions, please contact me at dsokda@triton.uog.edu or 735-2902/2990.

Si Yu'os Ma'åse,

David S. Okada

David S. Okada
Interim Facilities Management and Services
Interim Chief of Staff and Board Liaison

APPENDIX D

Phase I Environmental Site Assessment Report

PHASE I ENVIRONMENAL SITE ASSESSMENT REPORT
FOR
UNIVERSITY OF GUAM CULTURAL REPOSITORY FACILITY
MAGA, MANGILAO, GUAM
LOT 5372-SA (POR.)

5 ACRES

MNA PROJECT 2625_6

MAY 22, 2019

Myounghee Noh & Associates

Environmental Studies and Consulting Services

200 Kohola Street, Hilo, Hawaii, USA 96720 • 808.935.8727
99-1046 Iwaena Street, Suite 210A, Aiea, Hawaii, USA 96701 • 808.484.9214

This Phase I ESA report is prepared for:

SSFM International, Inc.
215 Rojas Street, Suite 213
Harmon, Guam 96913

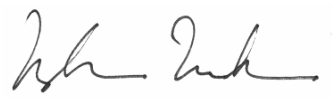
PHASE I ENVIRONMENTAL SITE ASSESSMENT REPORT FOR UNIVERSITY OF GUAM CULTURAL REPOSITORY FACILITY MAGA, MANGILAO, GUAM LOT 5372-3A (POR.)

5 acres
MNA Job No. 2625_6

May 22, 2019

I declare that, to the best of my professional knowledge and belief, I meet the definition of *Environmental professional* as defined in §312.10 of 40 CFR 312.

I have the specific qualifications based on education, training, and experience to assess a *property* of the nature, history, and setting of the *subject property*. I have developed and performed the all appropriate inquiries in conformance with the standards and practices set forth in 40 CFR 312.



Myounghee Noh, Environmental Professional
Principal

Myounghee Noh & Associates, L.L.C.
Environmental Studies and Consulting Services
99-1046 Iwaena Street, Suite 210A
Aiea, Hawaii 96701
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CONTRIBUTORS

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Technical Editor	Jessica Walsh
Environmental Professional	Myounghee Noh

LIST OF ABBREVIATIONS

CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CESQG	Conditionally Exempt Small Quantity Generators
CORRACTS	RCRA Facilities that are undergoing “corrective action”
EC	Engineering Control
ERIS	Environmental Risk Information Services
EPA	Environmental Protection Agency, U.S.
ERIS	Environmental Risk Information Services
ERNS	Emergency Response Notification System
ESA	Environmental Site Assessment
FEMA	Federal Emergency Management Agency
FINDS	Facility Index System/Facility Registry System
FOIA	Freedom of Information Act
GEPA	Guam Environmental Protection Agency
GPA	Guam Power Authority
IC	Institutional Control
kg	kilogram
LQG	Large Quantity Generator
MGd	million gallons per day
mg/L	milligrams per liter
MNA	Myounghee Noh & Associates, L.L.C.
NFRAP	No Further Remedial Action Planned
NLR	No Longer Regulated Generators
NPL	National Priorities List
RCRA	Resource Conservation and Recovery Act
REC	Recognized Environmental Condition
SEMS	Superfund Enterprise Management System
SQG	Small Quantity Generator
TSD	Treatment, Storage, and Disposal
UOG	University of Guam
UST	Underground Storage Tank

EXECUTIVE SUMMARY

Myounghee Noh & Associates, L.L.C. (MNA), was retained in October 2018 to conduct a Phase I Environmental Site Assessment (ESA) for the 5-acre subject property identified as lot 5372-3A (por.) in Maga, Mangilao, Guam. At the time of this Phase I ESA, the subject property was owned by the Government of Guam. The U.S. Department of Defense Office of Economic Adjustment awarded a grant to the Office of the Governor, with the University of Guam being a sub-recipient responsible for the planning, design, and construction of the cultural repository. This Phase I ESA is being completed for SSFM International, Inc., and the University of Guam (UOG) in preparation of an Environmental Assessment for the development of the cultural repository at the subject property. The subject property includes the area of Alternatives A and B for the proposed cultural repository site.

The purpose of this Phase I ESA is to identify *recognized environmental conditions* (*RECs*) at the subject property, with respect to the range of contaminants within the scope of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and petroleum products. A Phase I ESA consists of four parts: review of state, federal, and local environmental records; a site reconnaissance; interviews; reporting.

The subject property was located in Maga, Mangilao, in the eastern-central region of Guam, less than 1 mile north of Pago Bay. The subject property occupies southern portion of Lot 5372-3A and was vegetated and undeveloped (Figure 1). It is accessed by University Avenue and Atbut Lane and is across the street and northeast from the UOG campus.

FINDINGS

No environmental records were found in National Priority List (NPL) sites, Federal Resource Conservation and Recovery Act (RCRA) CORRACTS and Non-CORRACTS Treatment Storage Disposal Facilities, Delisted NPL sites, Federal Comprehensive Environmental Response, Compensation, and Liability Information System sites, Federal Superfund Enterprise Management System-Archive sites, State registered leaking underground storage tank (UST) sites, Federal engineering control/institutional control registries, Federal Emergency Response Notification System list sites, Federal Brownfields sites, or Federal release sites were identified at the subject property or surrounding properties.

Subject Property

The Guam Fire Department and Guam Environmental Protection Agency (GEPA) Hazardous Waste Management Program indicated no files or incidents for the subject property. MNA also researched the GEPA UST Universe database and found no files for the subject property (Guam Environmental Protection Agency, 2018).

Non-REC

Joaquin Cruz indicted during an interview on 16 March 2019 that drums containing oil may be present on the southern portion of the subject property along Atbut Lane. No drums were observed during the site reconnaissance in this or other portions of the subject property. As a result, this is not considered a REC.

RECs

Two abandoned vehicles, appliances, and other municipal solid waste were observed on the southwestern portion of the subject property. The subject property was also heavily vegetated preventing a thorough inspection of the potential illegal dump area. It is likely that hazardous materials or petroleum products have leaked from the abandoned vehicles but were not visible due to the heavy

vegetation, and that additional hazardous materials or petroleum products may have been dumped in the area but were not visible. This is a REC.

The southern portion of the subject property was used as Quonset hut housing for the military during the post-World War II construction boom. However, insufficient information is available for the land use of the subject property. The past occupancy of the subject property by the U.S. Department of Defense and the undocumented activities which may have impacted the property, could lead to a REC.

Surrounding Area

Non-REC

The UOG (Facility) Station was identified as a RCRA large quantity generator (LQG) and UST site and is located 1,230 feet east northeast and upgradient of the subject property. The UOG Station had three violations reported as a Large Quantity Generator. Three USTs were also associated with the UOG Station. Based on a data provided by the environmental database search, there have been no releases of hazardous substances or petroleum products from the UOG Station. As a result, the UOG Station is not a REC.

REC

Two pole-mounted transformers were observed on the adjoining properties in fair condition. Black staining was observed on the exterior of the transformers indicating a potential release. The Guam Power Authority responded that there were no transformers at the adjoining properties. As a result, it is not known if the transformers contain polychlorinated biphenyls (PCB). Based on the condition of the transformers, and the lack of information regarding their PCB status, the two transformers are a REC.

The Marine Corps Headquarters and Artillery was established in the present UOG area and the adjoining property to the east was used as Quonset hut military housing. Review of historical aerial photographs also show small structures and cleared areas within the vegetated areas on the adjoining properties to the north, west, and south. Insufficient information is available for the land use by the military and if hazardous substances and/or petroleum products were used on the adjoining properties during military occupancy. The past occupancy of the adjoining properties by the Marine Corps Headquarters and Artillery, and the undocumented activities which may have impacted the subject property, could lead to a REC.

RECOGNIZED ENVIRONMENTAL CONDITIONS

MNA performed a *Phase I Environmental Site Assessment* in conformance with the scope and limitations of ASTM E 1527-13 of the 5-acre subject property of Lot 5372-3A located in Maga, Mangilao, Guam. At this writing, there were no evidence of RECs, except the following:

- A high likelihood of releases of hazardous substances and/or petroleum products to the subject property based on the observation of two abandoned vehicles, appliances, and municipal solid wastes observed on the southwestern portion of the subject property.
- Two transformers with visible exterior staining and no information regarding their PCB status.
- The land use of the subject and adjoining properties by the U.S. Department of Defense during 1948-1953, which may have resulted in willful or accidental release or burial of hazardous substances/materials and/or petroleum products.

1.0 INTRODUCTION

This report presents the results of a Phase I Environmental Site Assessment (ESA) conducted during February to May 2019 for the 5 acres of Lot 5272-3A (por.) in Maga, Mangilao, Guam (Figure 1). The lot is owned by the Government of Guam and is currently undeveloped.

The U.S. Department of Defense Office of Economic Adjustment awarded a grant to the Office of the Governor, with the University of Guam (UOG) being a sub-recipient responsible for the planning, design, and construction of a cultural repository. This Phase I ESA was conducted by Myounghee Noh & Associates, L.L.C., herein referred to as MNA, for SSFM International, Inc., and the UOG, in preparation of an Environmental Assessment for the development of the cultural repository facility. The subject property includes the area of Alternatives A and B for the proposed cultural repository site.

1.1 PURPOSE

The purpose of this Phase I ESA is to identify any *recognized environmental conditions* (RECs) at the subject properties, with respect to a range of contaminants within the scope of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and petroleum products. This practice is intended to permit a user to satisfy one of the requirements to qualify for the innocent landowner defense to CERCLA liability, "all appropriate inquiry into the previous ownership and uses of the site consistent with good commercial or customary practice." The term *recognized environmental condition* denotes the presence, or likely presence, of any hazardous substances or petroleum products on the properties under conditions that indicate an existing release, a past release, or a material threat of a release into structures on the properties or into the ground, groundwater, or surface water of the properties (ASTM International, 2013).

This report is part of the Phase I ESA conducted for the subject properties. The assessment was conducted in accordance with the practices described in Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process (ASTM International, 2013).

1.2 DETAILED SCOPE OF SERVICES

A Phase I ESA has four components: records review, site reconnaissance, interview, and report. MNA conducted this ESA using information sources with the potential to identify past or current releases of hazardous substances or petroleum products into the subject properties. Adjoining properties were also evaluated for their potential to impact the subject properties. Per the ASTM International Phase I ESA Standard, adjoining properties include parcels touching the subject properties as well as those properties across a roadway (ASTM International, 2013).

1.2.1 Site History

Where available and as needed, MNA researched historical and current topographic maps, tax records, fire insurance maps, regulatory agency websites, and aerial photographs to identify previous and current uses of the properties, adjoining properties, and the surrounding area.

Figure 1. Site Location Map
UOG Cultural Repository Facility, Lot 5372-3A (por.)
Phase I Environmental Site Assessment
Maga, Mangilao, Guam

1.2.2 Regulatory Records

MNA examined government records with respect to environmental conditions, citations, complaints, and permits at the subject properties, at adjoining properties, and within the surrounding area. MNA utilized a records search provided by Environmental Risk Information Services (ERIS), to review records from the following federal and state programs:

- National Priorities List (NPL)
- Delisted NPL
- Resource Conservation and Recovery Act (RCRA) facilities that are undergoing "corrective action" (CORRACTS)
- RCRA-Treatment, Storage, & Disposal (TSD)
- Comprehensive Environmental Response, Compensation & Liability Information System (CERCLIS) List
- Superfund Enterprise Management System Archive [SEMS; formerly CERCLIS No Further Remedial Action Planned (NFRAP) List]
- Federal Brownfields
- Leaking Underground Storage Tank (Leaking UST)
- Underground Storage Tank (UST)
- Emergency Response Notification System (ERNS)
- RCRA – Generators, including those No Longer Regulated (NLR)
- Federal releases
- Federal Land Use Controls

Additionally, MNA requested environmental case files from the Guam Environmental Protection Agency (GEPA), Guam Power Authority (GPA), and Guam Fire Department.

1.2.3 Site Reconnaissance

MNA performed a site reconnaissance to obtain information indicating the likelihood of contamination, to interview available site personnel, and to conduct a brief assessment of the adjoining properties. During the site reconnaissance, MNA looked for a variety of indicators of environmental hazards including, but not limited to, stained surface soil, dead or stressed vegetation, hazardous substances, aboveground and underground storage tanks, disposal areas, groundwater wells, drywells, and sumps. Sampling and testing of soil, surface water, or groundwater were not part of this assessment.

1.2.4 Site Geology and Hydrogeology

MNA reviewed published information for the properties and surrounding area on surface and subsurface conditions such as topography, drainage, surface water bodies, subsurface geology, and groundwater. MNA used this information to assess the potential for migration and impact of the subject properties by releases of hazardous substances or petroleum products at off site properties.

1.2.5 Data Evaluation and Reporting

MNA evaluated the information collected, and prepared this report as part of the assessment. Section 2 presents the site background information; Section 3 user provided information; Section 4 information collected from records review; Section 5 site reconnaissance; Section 6 interviews; Section 7 data gaps; Section 8 key findings and opinion; and Section 9 conclusion.

1.3 SIGNIFICANT ASSUMPTIONS

The conclusion presented in this report is based upon the assumption that reasonably ascertainable and relevant information pertaining to the environmental condition of the subject properties was made available to MNA during the assessment. Information obtained from government agencies and other resources is presumed to be accurate and updated. Additionally, information collected in interviews is collected in "good faith" and believed to be true and accurate to the best knowledge of the interviewee.

1.4 LIMITATIONS AND EXCEPTIONS

The Phase I ESA provides a "snapshot" of the property conditions at the time of the assessment. Findings, opinions, and conclusions apply to property conditions existing at the time of the investigation and those reasonably foreseeable. They do not apply to conditions at, or changes to, the properties, of which MNA is not aware, could not reasonably be aware, and has not had the opportunity to evaluate.

This report is based upon visual observations of the subject properties and its vicinity, interpretation of the available historical and regulatory information and documents reviewed, and interviews of individuals with knowledge of the subject or surrounding properties. MNA cannot ensure the accuracy of the historical or regulatory information. This report is intended exclusively for the purpose outlined and applies only to the subject properties.

This Phase I ESA excludes asbestos, lead paint, clandestine methamphetamine laboratories, and investigation of geotechnical or geophysical concerns. No surface or subsurface sampling was involved.

1.5 SPECIAL TERMS AND CONDITIONS

This Phase I ESA was conducted and prepared by MNA for the exclusive use of SSFM International, Inc., and the UOG. This report shall not be relied upon or transferred to any other parties without a written authorization from SSFM International, Inc., or the UOG.

1.6 USER RELIANCE

This report is an instrument of service of MNA, which summarizes its findings and opinions with respect to *recognized environmental conditions* at the subject properties. Findings and opinions are predicated on information that MNA obtained on the dates and from individuals stated herein, from public records reviewed, a site reconnaissance, and ancillary Phase I ESA activities. This assessment relies upon the accuracy and completeness of the information provided. The information obtained for this assessment is used without extraordinary verification. It is possible that other information exists

and is discovered, or environmental conditions change subsequent to the submittal of this Phase I ESA report, to which MNA shall not be held responsible for exclusion.

2.0 SITE DESCRIPTION

This section contains location and legal description; site and vicinity general characteristics; current subject property uses; structures, roads, and other improvements; past subject property uses; and current and past use of adjoining properties.

2.1 LOCATION AND LEGAL DESCRIPTION

The 5-acre subject property is located on the southern portion of Lot 5372-3A, Maga, Mangilao, Guam. The subject property is accessed via Atbut Lane to the south and University Avenue to the east. A lot map is presented in Figure 2.

2.2 SITE AND VICINITY GENERAL CHARACTERISTICS

The subject property is located in Mangilao, Guam. Mangilao is located in eastern-central Guam, between the villages of Barrigada and Chalan Pago. The subdivisions in Mangilao include Latte Heights, Latte Plantation, Sunrise Villa, Banyan Heights, and Lower and Upper Pagat. In 2010, Mangilao had a population of 15,191 (Guam State Data Center, 2012).

Mangilao was once an ancient Chamoru village dating back more than 1,000 years. It is believed that the original inhabitants fled from Spanish rule (Guampedia, 2019). It was not redeveloped until the 1920s when water wells, a school, and a road were built in an effort to encourage the people to develop agricultural area (Hutton, 1962). Mangilao was Guam's main farming area until after World War II. The major crops included cassava, corn, beans, tomatoes, and peppers (Guampedia, 2019).

Major development took place following World War II, when thousands of construction workers employed by the military populated the village for post-war rebuilding which included the construction of houses, roads, and grocery stores (Guampedia, 2019). This also included land clearing and Quonset huts being built on the southern portion of the subject property. Mangilao supported one of the many post-invasion U.S. military installations on the island. The Marine Corps Headquarters and Artillery was established in the present UOG area. This post-war population influx led Mangilao to form its own municipality in 1952 (Garcia and Associates, 2019).

In 1960, the Territorial College of Guam moved from Mongmong to its current location in Mangilao. The college was accredited as a four-year institution in 1965. Today, the University of Guam is recognized as the major institution of higher education in the Western Pacific. Mangilao is also home to other government agencies such as the Department of Public Health and Social Services, the Department of Agriculture, the Department of Corrections, and the Department of Youth Affairs. Guam Community College, two elementary schools, George Washington High School, a public television station, and churches are also located in Mangilao (Guampedia, 2019).

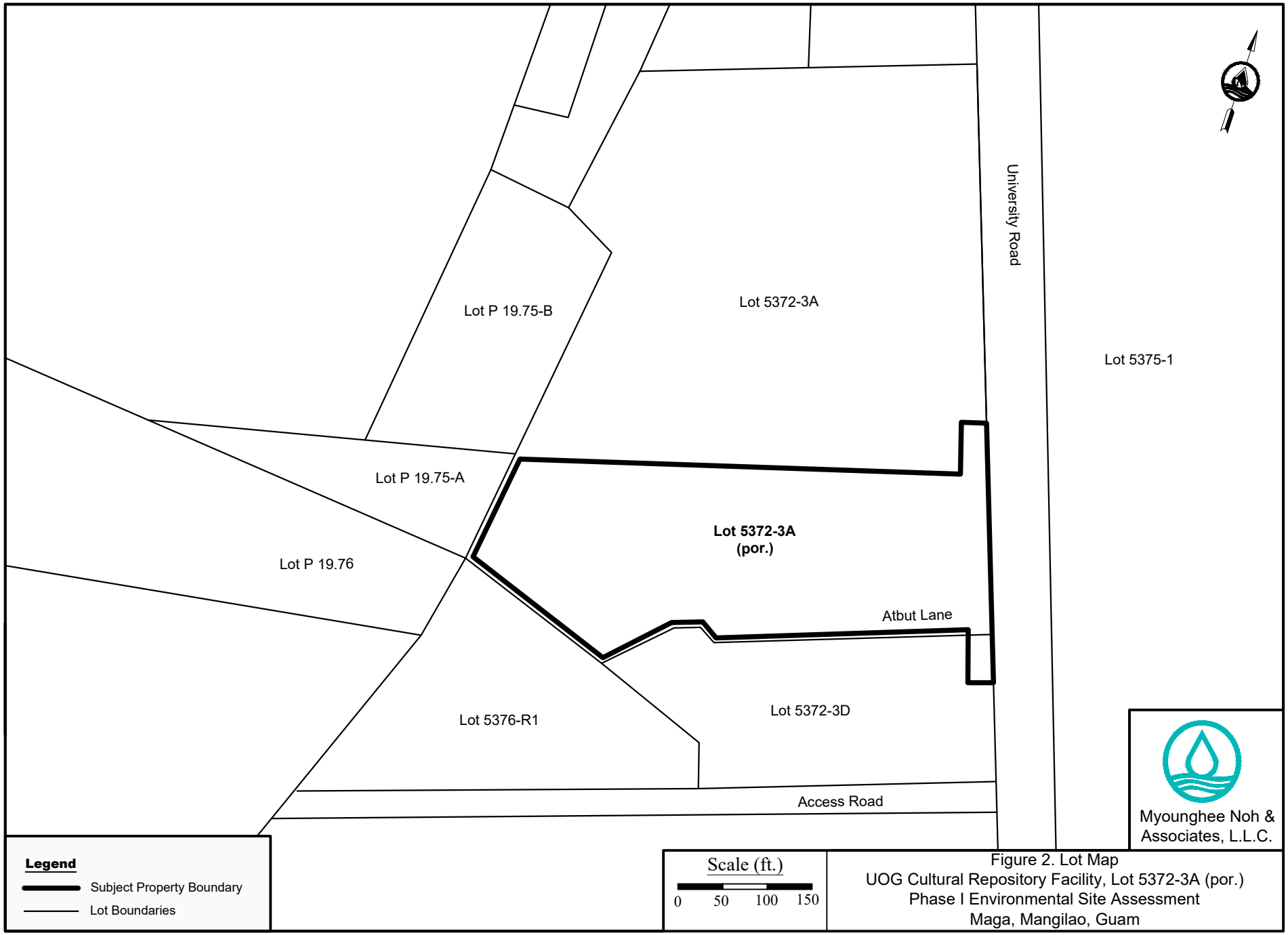

Figure 2. Lot Map
UOG Cultural Repository Facility, Lot 5372-3A (por.)
Phase I Environmental Site Assessment
Maga, Mangilao, Guam

2.3 GEOLOGY

Published geologic reports and maps were reviewed to obtain information regarding subsurface conditions in the general area of the property. Guam is located on the Marianas Ridge, a volcanic arc approximately 100 miles west of the Mariana Trench. The ridge was formed as a result of subduction of the Pacific Plate, an oceanic plate of the earths' crust, under the Philippine Plate.

Guam is constructed of a series of volcanic deposits, upon which limestone has been deposited. The volcanic deposition occurred during the Eocene, Oligocene, and Miocene epochs. The material is primarily andesite with some basaltic flow, and it was deposited as tuff, tuff breccia, tuffaceous sandstone and shale, volcanic conglomerate, and basalt flows (U.S. Department of Agriculture, Soil Conservation Service, 1988).

The United States Department of Agriculture, Soil Conservation Service classifies soil at the subject property as Guam Soils, Soils of Limestone Uplands. This soil is well-drained, moderately to rapidly permeable soils that are very shallow to limestone bedrock on uplifted plateaus. They are formed in sediment overlying porous coralline limestone with slopes of 0 to 15 percent. Guam soils are red cobbly clay loam throughout. Minor soils in this area are Yijo and Ritidian soils, urban land, and rock outcrop (U.S. Department of Agriculture, Soil Conservation Service, 1988).

Additional soil information for the subject property was obtained from the United States Department of Agriculture Natural Resources Conservation Service, which classifies the soil as 96 percent Guam cobbly clay loam (3-7% slopes) and 4 percent Guam urban land complex (0-3% slopes). Typically, both Guam cobbly clay loam and urban land complex are composed of cobbly clay loam from 0 to 2 inches, gravelly clay loam from 2 to 8 inches, and bedrock from 8 to 12 inches. The limestone deposits are well drained with more than 80 inches to the water table (United States Department of Agriculture, 2017).

2.4 HYDROLOGY AND HYDROGEOLOGY

Published hydrology and hydrogeology reports and maps were reviewed to obtain information regarding subsurface conditions in the general area of the property. The primary aquifer on Guam extends from the northernmost tip of the island to where the southern highlands start, north of Apra Harbor. Percolation of precipitation through the rock formations to the underlying saltwater forms a lens of fresh groundwater that floats on top of the saltwater. The freshwater lens is divided into two zones based on chloride concentrations. The upper zone is the basal freshwater lens where the chloride concentration is less than the USEPA secondary Maximum Concentration Level of 250 milligrams per liter (mg/L). The transition zone between freshwater and saltwater begins where chloride concentration exceeds 250 mg/L down to a point where the chloride concentration is nearly equal to that of seawater.

Mangilao has a well production of approximately 2.2 million gallons per day (MGd), with an available yield of approximately 4.4 MGd (Naval Facilities Engineering Command Pacific, 2015).

In northern Guam, water is obtained from wells that tap the upper part of a fresh groundwater lens in an aquifer composed mainly of limestone (U.S. Geological Survey, 2003). The freshwater

aquifers on Guam are susceptible to contamination from surface activities and from saltwater intrusion (Naval Facilities Engineering Command Pacific, 2010).

The Federal Emergency Management Agency Flood Map Explorer website shows that the flood maps for the subject property and vicinity, maps 6600010095D and 6600010125D, but did not indicate if the subject property is within a flood prone area (Federal Emergency Management Agency, 2018).

2.5 CURRENT USE OF THE SUBJECT PROPERTIES

The subject property is owned by the Government of Guam and is mainly undeveloped. Atbut Lane is a road located on the southern boundary of the subject property and provides access to two apartment buildings located on the adjoining property to the south. University Avenue is a main thoroughfare located on the eastern subject property boundary.

2.6 STRUCTURES, ROADS, AND OTHER IMPROVEMENTS

There were no structures present on the subject property. Atbut Lane was present on the southern boundary of the subject property and was lined with utility poles. University Avenue was present on the eastern boundary of the subject property and was also lined with utility poles. No other improvements were present at the subject property, except for paved roads.

2.7 PAST USES OF THE SUBJECT PROPERTIES

Information regarding past uses of the subject properties was obtained from a review of historic topographic maps, historic aerial photographs, user provided information, and interviews. Table 1 summarizes available information regarding the historical use and users of the subject property.

Table 1. Users and Primary Uses of Subject Property

Period (approx.)	Owner/Lessee*	Area (acres)	Primary Use
Lot 5372-3A (por.), Maga, Mangilao, Guam			
1964-present	Government of Guam	5	Undeveloped with the exception of Atbut Lane on the south boundary and University Avenue on the east boundary
1948-1953	U.S. Department of Defense	5	Quonset hut military housing
1944	---	5	Agricultural

--- Information unavailable

* Tax records showing land ownership were not made available by the Guam Department of Land Management at the time of this writing.

2.8 CURRENT AND PAST USES OF ADJOINING PROPERTIES

Information regarding past uses of the adjoining properties were obtained from a review of historic topographic maps, historic aerial photographs, user provided information, and interviews. Table

2 summarizes available information regarding the historical use and users of the adjoining properties.

Table 2. Users and Primary Uses of Adjoining Properties

Period (approx.)	Owner/Lessee*	Area (acres)	Primary Use
Lot 5372-3A (por.), Maga, Mangilao, Guam Adjoining property to the north			
1972-present	Government of Guam	~5.5	Undeveloped with the exception of University Avenue on the east boundary and one driveway/trail on the southern portion.
1972	Government of Guam	~5.5	Undeveloped with the exception of University Avenue on the east boundary and one driveway/trail on the southern portion of the property
1964-1971	Government of Guam	~5.5	Undeveloped with the exception of University Avenue on the east boundary
1953	---	~5.5	Unknown, three small structures
1948	---	~5.5	Undeveloped
1944	---	~5.5	Undeveloped/Agricultural
Lot 19.75-8, Maga, Mangilao, Guam Adjoining property to the northwest			
1967-present	---	---	Undeveloped
1944-1953	---	---	Undeveloped/Agricultural
Lot 19.75A, Maga, Mangilao, Guam Adjoining property to the west			
2013-present	---	---	Undeveloped
2005	---	---	Cleared area
1972	---	---	Driveway
1953-1967	---	---	Cleared area and driveway
1948	---	---	Cleared area
1944	---	---	Undeveloped/Agricultural
Lot 19.76, Maga, Mangilao, Guam Adjoining property to the southwest			
2005-present	---	---	Undeveloped
1972	---	---	Driveway
1967-1972	---	---	Driveway or trail, remainder of property undeveloped
1953	---	---	Cleared area and driveway
1948	---	---	Undeveloped/Agricultural
1944	---	---	Undeveloped/Agricultural
Lot 5376-R1, Maga, Mangilao, Guam Adjoining property to the southwest			

Period (approx.)	Owner/Lessee*	Area (acres)	Primary Use
1995-present	---	---	Residential
1992-1994	---	---	College staff housing
1967-1991	---	---	Residential
1948-1953	---	---	Northwestern portion cleared land, remainder of property undeveloped
1944	---	---	Undeveloped/Agricultural
Lot 5372-3D, Maga, Mangilao, Guam Adjoining property to the south			
1972-present	---	---	Apartments
1967	---	---	Undeveloped
1944-1953	---	---	Undeveloped/Agricultural
Lot 5375-1, Maga, Mangilao, Guam Adjoining property to the east			
1960-present	Government of Guam	---	University of Guam campus
1953	U.S. Department of Defense	---	Quonset hut military housing and Marine Corps Headquarters and Artillery
1948	---	---	One road/driveway and one structure
1944	---	---	Undeveloped/Agricultural

--- Information unavailable
* Tax records showing land ownership were not made available by the Guam Department of Land Management at the time of this writing.

3.0 USER PROVIDED INFORMATION

User provided information was obtained by having Sonny Perez, Chief Plant and Facilities Officer at the UOG, complete a "User Questionnaire" administered by MNA. The information in the following sections was obtained from the questionnaire. Mr. Perez has been employed at the UOG since 2002. Additional information obtained from an interview with Mr. Perez is included in Section 6.1.

3.1 ENVIRONMENTAL LIENS OR ACTIVITY AND USE LIMITATIONS

Mr. Perez was unaware of any environmental cleanup liens or activity and land use limitations at the subject property.

3.2 SPECIALIZED KNOWLEDGE

Specialized knowledge for the subject property and surrounding properties provided by Mr. Perez is provided in Section 6.1.

3.3 VALUATION REDUCTION

Information pertaining to the valuation reduction of the subject property is not pertinent to this Phase I ESA because the property ownership is not being transferred.

3.4 REASON FOR PERFORMING THE PHASE I ESA

The purpose of this Phase I ESA is to identify any *recognized environmental conditions* at the subject property, within the scope of ASTM Standard 1527-13, for an Environmental Assessment for the proposed cultural repository facility.

4.0 RECORDS REVIEW

Under ASTM 1527-13, records are to be reviewed by the environmental professional who may help identify RECs in connection with the subject properties.

4.1 STANDARD ENVIRONMENTAL RECORD SOURCES

MNA used Environmental Risk Information Services (ERIS) to search standard federal and state government databases for hazardous substance or petroleum product releases that could impact the subject properties. A copy of the ERIS report is provided in Appendix A.

ASTM E 1527-13 specifies a minimum search distance for specific environmental record sources. The following sources are specified for incidents or sites within 1 mile of the subject property:

- Federal NPL site list
- Federal RCRA CORRACTS TSD facilities list

The following sources are specified for incidents or sites within ½ mile of the subject property:

- Federal Delisted NPL site list
- Federal CERCLIS list
- Federal SEMS-Archive site list (formerly CERLIS-NFRAP)
- Federal RCRA non-CORRACTS TSD facilities list
- State leaking UST list

The following sources are for incidents on the subject and adjoining property:

- Federal RCRA generators list
- State registered UST list

Finally, the following are for incidents for the subject property:

- Federal Institutional Controls (IC) and Engineering (EC) Registries
- Federal ERNS list

MNA also searched additional record sources including the following.

- Federal Brownfields Sites within ½-mile of the subject property
- Federal Release Sites (FINDS) for the subject property

The following environmental database searches required under ASTM E 1527-13 were not attained because the databases do not exist for Guam.

- State-equivalent NPL
- State-equivalent CERCLIS
- State landfill and/or solid waste disposal site list
- State voluntary cleanup program sites
- State Brownfield Sites
- State IC and EC Registries
- State Releases list

The following subsections summarize the results of the ERIS records review for the datasets listed above (Environmental Risk Information Services, 2019).

4.1.1 Federal National Priorities List

The NPL, maintained by the U.S. Environmental Protection Agency (EPA), is a list of highly contaminated sites that have been identified by Superfund Amendments and Reauthorization Act of 1986. There were no NPL sites identified within 1 mile of the subject property (Environmental Risk Information Services, 2019).

4.1.2 Federal RCRA CORRACTS TSD Facilities List

The RCRA CORRACTS TSD facilities list maintained by the EPA contains generators, transporters, treaters, storers, and disposers of hazardous waste that have reported violations and are subject to corrective actions. There were no RCRA CORRACTS TSD within 1 mile of the subject property (Environmental Risk Information Services, 2019).

4.1.3 Delisted NPL Site List

This list, maintained by the EPA, contains delisted NPL sites. No delisted NPL sites were identified within ½ mile of the subject property (Environmental Risk Information Services, 2019).

4.1.4 Federal CERCLIS List

The CERCLIS list, maintained by the EPA, contains sites that are either proposed to be or are on the NPL list, as well as sites that are in the screening and assessment phase for possible inclusion on the NPL. No federal CERCLIS sites were identified within ½ mile of the subject property (Environmental Risk Information Services, 2019).

4.1.5 Federal SEMS-Archive Site List

SEMS-Archive (Superfund Enterprise Management System Archive) tracks sites that have no further interest under the Federal Superfund Program based on available information. The list was

formerly known as the CERCLIS-NFRAP, renamed to SEMS-Archive by the EPA in 2015. The SEMS-Archive list, maintained by the EPA, contains designated CERCLA sites that, to the best of the EPA's knowledge, assessment has been completed and has determined that no further steps will be taken to list the sites on the NPL. No SEMS-Archive sites were identified within ½ mile of the subject property (Environmental Risk Information Services, 2019).

4.1.6 Federal RCRA non-CORRACTS TSD Facilities List

The RCRA non-CORRACTS TSD facilities list, maintained by the EPA, contains RCRA permitted facilities that treat, store, or dispose of hazardous waste. No RCRA TSD facilities listed were identified within ½ mile of the subject property (Environmental Risk Information Services, 2019).

4.1.7 State Leaking UST List

This list, maintained by the GEPA Hazardous Waste Program, is an inventory of sites with Leaking USTs. No Leaking UST facilities were identified within ½ mile of the subject property (Environmental Risk Information Services, 2019).

4.1.8 Federal RCRA Generators List

The RCRA Generators list, maintained by the EPA, contains small and large quantity generators of hazardous waste. The determination of generator size is used to establish the risk that the facility poses to public health and the environment and consequently, the amount of regulation and reporting required. Large Quantity Generators (LQG) are facilities that generate more than a 1,000 kilogram (kg)/month of hazardous waste and/or more than 1 kg/month of acute hazardous waste. Small Quantity Generators (SQG) are facilities that generate less than 1,000 kg/month but more than 100 kg/month of hazardous waste and/or less than 1 kg/month of acute hazardous waste.

Conditionally Exempt Small Quantity Generators (CESQG) are facilities that generate less than 100 kg/month of hazardous waste and/or less than 1 kg/month of acute hazardous waste. The EPA also maintains the RCRA NLR list. This list contains facilities that were once on the RCRA generators list, but are no longer in business, no longer in business at the listed address, or are no longer generating hazardous waste substances in quantities that require reporting. No SQG, CESQG, or NLR generators were identified on the subject or adjoining properties, or in the surrounding area. One LQG was identified as UOG Station located 0.23 mile (1,231 feet) east southeast and upgradient of the subject property (Environmental Risk Information Services, 2019). The facility generated spent halogenated solvents, ignitable, and corrosive wastes. Three violations were reported, with a case closed for one of the violations. Refer to Section 8.2 for determination of impact of the site on the subject property.

4.1.9 State Registered UST List

The GEPA Hazardous Waste Program maintains a database of known USTs. One UST facility was identified within ¼ mile of the subject property. The UOG Station was identified 0.23 mile (1,231 feet) east southeast and upgradient of the subject property. Two 2,500-gallon and one 4,000 gallon USTs were installed in November 1995 and are owned by the Government of Guam

(Environmental Risk Information Services, 2019). Refer to Section 8.2 for determination of impact of the site on the subject property.

4.1.10 Federal IC and EC Registries

The federal IC and EC registries contain federally listed sites that are required to implement Institutional Controls (IC) or Engineering Controls (EC). Because the sites may continue to be impacted by past use, future use of the property may be restricted in order to protect human health and the environment. Land use controls can be either ICs or ECs. Institutional controls are limitations on how the property may be used such as prevention of soil disturbance. Engineering controls are physical structures or devices located on the property that contain or limit human or environmental exposure to contamination. Engineering controls need to be maintained or protected to be effective. No Federal IC or EC sites were identified within ½ mile of the subject property (Environmental Risk Information Services, 2019).

4.1.11 Federal ERNS List

The ERNS list, maintained by the EPA, contains CERCLA hazardous substance releases or spills, as maintained at the National Response Center. No incidents were identified on the subject property (Environmental Risk Information Services, 2019).

4.1.12 U.S. Brownfields

U.S. Brownfields are real property, of which the expansion, redevelopment, or reuse may be complicated by the presence of a hazardous substance, pollutant, or contaminant. No U.S. Brownfields sites were identified within 1 mile of the subject property (Environmental Risk Information Services, 2019).

4.1.13 Facility Index System/Facility Registry System

The FINDS is a centrally managed EPA database that identifies facilities, sites, or places of environmental interest in the United States. No FINDS sites were identified in proximity to the subject property (Environmental Risk Information Services, 2019).

4.1.14 Hazardous Materials Incident Reporting System

The Hazardous Materials Incident Reporting System, also called SPILLS or SPILLS90, includes hazardous materials spills that were reported to state Department of Transportation. No SPILLS sites were identified in proximity to the subject property (Environmental Risk Information Services, 2019).

4.2 ADDITIONAL RECORD SOURCES

MNA reviewed additional environmental records as needed and available. Records filed by the GEPA, Guam Fire Department, and GPA were requested. MNA researched the GEPA UST Universe database and EPA RCRAInfo database for files for the subject and adjoining properties (Guam Environmental Protection Agency, 2018).

4.2.1 Subject Property

During the site reconnaissance, three telephone junction boxes were observed on the subject property. MNA requested environmental records from GPA on 17 April 2019 and followed up on 26 April 2019 and 01 May 2019, for information pertaining to electrical equipment at the subject property. The GPA responded on 12 May 2019 that there were no GPA transformers at the noted locations.

MNA submitted a records request to the Guam Fire Department on 06 March 2019. The Guam Fire Department responded on 18 April 2019 that they did not have any records of response for fire, hazardous material releases, or other emergencies for the subject property.

MNA submitted a Freedom of Information Act (FOIA) request to the GEPA for any environmental reports or records associated with the subject property on 17 April 2019 and followed up on 01 May 2019. The GEPA Hazardous Waste Management Program did not have records for the subject property. Other GEPA programs had not responded at the time of this writing.

MNA researched the GEPA UST Universe database for files for the subject property (Guam Environmental Protection Agency, 2018). There were no UST records for the subject property.

4.2.2 Surrounding Properties

During the site reconnaissance, five pole-mounted transformers and three telephone pedestals were observed on the adjoining properties. MNA requested environmental records from GPA on 17 April 2019 and followed up on 26 April 2019 and 01 May 2019, for information pertaining to electrical equipment at the adjoining properties. The GPA responded on 12 May 2019 that there were no GPA transformers at the noted locations. Telephone pedestals are located at the site and are owned by GTA Teleguam, Inc. A follow-up email was sent to GPA in regards to the observed transformers on the adjoining properties. Reponses from the GPA was pending at the time of this writing.

MNA submitted a records request to the GEPA on 07 March 2019 for the adjoining property to the east, the UOG campus. The GEPA responded on 13 March 2019 that three permitted USTs were located at the UOG Station Mangilao. The three USTs were identified as being located on Lot Numbers 5376 NEW-5-R1 and 5376 NEW-3, Mangilao. The permit was issued on 30 January 2019. MNA researched the GEPA UST Universe database for files for the adjoining properties (Guam Environmental Protection Agency, 2018). The file indicated one 4,000-gallon diesel UST and two 2,500-gallon diesel USTs at the UOG property that were installed on 01 November 1991.

The GEPA also indicated that the UOG is a LQG (EPA ID #GU0 000 286 427) per GEPA waste generation standards. No additional information regarding the LQG was provided by the GEPA. MNA researched the site on the EPA RCRAInfo database. In 2017, the UOG Station generated and shipped 0.3 ton of hazardous wastes. The hazardous wastes included ignitable waste, corrosive waste, and spent halogenated solvents (U.S. EPA, 2019).

MNA submitted a formal FOIA request to the GEPA for any environmental reports or records associated with the adjoining properties on 17 April 2019 and followed up on 01 May 2019. The

GEPA indicated three USTs and one LQG present at the UOG, the adjoining property to the southeast. The GEPA Hazardous Waste Management Program did not have records for the subject property. Other GEPA programs had not responded at the time of this writing.

MNA researched the GEPA UST Universe database and RCRAInfo database for files for the adjoining properties (Guam Environmental Protection Agency, 2018). Information was provided for the UOG Station LQG and USTs, although no new information was included that was not already included in the ERIS database search or GEPA FOIA request.

4.3 HISTORICAL USE INFORMATION ON THE SUBJECT PROPERTY

MNA reviewed historical use information for the subject property, including aerial photographs and United States Geological Survey topographic maps. No fire insurance maps were available for the subject property.

4.3.1 Historical Aerial Photographs

Aerial photographs of the subject, adjoining, and surrounding properties were provided by ERIS (Environmental Risk Information Services, 2019). Photographs from the years 1944, 1948, 1953, 1967, 1972, 2005, 2013, and 2016 were reviewed. Table 3 provides the details for those photos.

Table 3. Aerial Photograph Details

Date	Image Type	Scale
1944	Black and White	1":500'
1948	Black and White	
1953	Black and White	
1967	Black and White	
1972	Black and White	
2005	False Color	
2013	False Color	
2016	Color	

For the reviewed aerial photographs, the following observations were made:

1944: The subject property is primarily undeveloped. Agriculture is visible on the east and west portions of the subject property. All adjoining properties are either undeveloped or agriculture. A trail is visible to the north of the subject property and enters the southeastern corner of the subject property. A second road is visible to the north. No buildings or structures are visible on the subject property or surrounding properties.

1948: University Avenue is on the eastern boundary and Atbut Lane is on the southern boundary of the subject property. Techaira Street is visible to the north of the subject property and Jesus Mariano Road is visible to the west. Some development is visible on the southern portion of the subject property. Two small structures are on the adjoining property to the east; no other structures are visible on other adjoining properties. Some buildings and structures are visible on the surrounding properties.

1953: Approximately ten small structures are visible on the southern portion of the subject property along Atbut Lane. A large scale development is located on the adjoining property to the east, with approximately 200 small structures on the property. The structures are identical in shape and size and may be containers, Quonset huts, or trailers. Other adjoining properties are either undeveloped, agriculture, or contain small structures or houses.

1967: The structures present on the subject property in the 1953 photograph are not visible. The remainder of the subject property is undeveloped, with the exception of Atbut Lane and University Avenue. The large development on the adjoining property to the east in the 1953 photograph is not visible; instead, a centralized grouping of larger buildings is present, likely the UOG campus buildings. A development, possible residential, is visible to the south of the subject property.

1972: Three additional buildings were added to the possible residential development south of the subject property. Buildings are located on the adjoining property to the northeast of the subject property and appear to be residential. The UOG is visible on the adjoining property to the east.

2005: The subject property is undeveloped. The adjoining properties to the northeast, south, and west appear to be residential, and the UOG is visible on the adjoining property to the east.

2013: No notable changes from the 2005 photograph were visible.

2016: No notable changes from the 2005 or 2013 photograph were visible.

MNA reviewed historical aerial imagery available from Google Earth. Photographs from the years 2006, 2010, and 2012 were reviewed. For the reviewed aerial photographs, the following observations were made:

2006: The subject property and adjoining property to the north are undeveloped and appear heavily vegetated with trees and brush. The adjoining properties to the northwest, northeast, and south appear to be residential. The adjoining property to the east appears landscaped with grass and some trees. The adjoining property to the southeast is utilized by the UOG, with several medium- to large-sized buildings and parking lots (27 February 2006).

2010: The area to the northwest is cleared and three newly constructed buildings are visible. A bare soil area is visible on the adjoining property to the north (06 February 2010).

2012: A bare soil area, surrounded by trees and brush, is visible directly to the northwest of the subject property. Two new building are visible on the property located to the northwest of the subject property (15 November 2012).

4.3.2 Historical Topographic Maps

USGS topographic maps that cover the subject property and vicinity were reviewed. Maps were reviewed for the years 1944, 1953, 1963, 1978, and 2000. The maps of the subject property and surrounding area depicted the following:

1944: The subject property is depicted as vegetated and in Masalog. A light-duty road is depicted to the north (later depicted as Route 10). Unimproved roads are depicted to the west and east of the subject property. Lates Point is depicted to the southeast of the subject property (U.S. Army Map Service, 1944).

1953: University Avenue is depicted on the east boundary and Abut Lane on the south boundary of the subject property. One structure is depicted on the eastern boundary of the subject property along University Avenue and two structures are depicted to the south along Atbut Lane. Structures are visible on the adjoining properties to the north, south, and west. Route 10 is depicted approximately 2,000 feet to the north as a primary highway (Army Map Service, 1953).

1963: The subject property is depicted as Government of Guam land; no buildings are depicted on the property. The adjoining property to the south contains five buildings. The adjoining property to the southwest is Government of Guam housing area, containing 35 structures. The adjoining property to the east and southeast is UOG and contains the science building, library, student union building, marine laboratory, administration building, four classroom buildings, and dormitories. Several buildings are depicted on the adjoining property to the northeast. Two structures are depicted on the adjoining property to the north (Department of Public Works, 1963).

1978: The subject property is vegetated and depicted in Cantan Maga, Mangilao. One structure is depicted either on the subject property or just adjacent to the northwest. Development consisting of approximately 40 structures are depicted to the south of the subject property. Structures are also depicted on the adjoining properties to the north and west. The College of Guam is depicted on the adjoining property to the east (U.S. Geological Survey, 1978).

2000: No structures are depicted on the subject property. Developed areas are depicted to the east, south, and west of the subject property. University Avenue is depicted on the west subject property boundary and Atbut Lane on the south boundary of the subject property. Route 10 is depicted as a secondary highway. Andersen Air Force Base is depicted approximately 1.5 miles to the northeast of the subject property (Environmental Risk Information Services, 2019). Andersen Air Force Base may be mapped incorrectly as the Air Force Base is known to be near Yigo, Guam, located approximately 12 miles northeast of the subject property.

4.3.3 Sanborn Fire Insurance Map

No Sanborn Fire Insurance maps were available for the subject property.

5.0 SITE RECONNAISSANCE

The site reconnaissance was conducted by Celeste Lim of MNA during 14-15 March 2019 and Bryan Chinaka on 09 May 2019. The site reconnaissance focused on identifying recognized environmental conditions with the ability to impact the subject property. A site map of the subject property is presented in Figure 3. Refer to Section 8.0 for findings related to the observations

made during the site reconnaissance. Photographs from the site reconnaissance are presented in Appendix B.

The site reconnaissance was conducted by visually inspecting the subject property and adjoining properties by vehicle and foot. MNA looked for a variety of environmental hazard indicators including, but not limited to, stained surface soil, dead or stressed vegetation, hazardous substances, above ground and underground storage tanks, disposal areas, groundwater wells, drywells, and sumps.

5.1 Methodology and Limiting Conditions

All areas of the subject property were surveyed. The property was heavily vegetated and access routes were cleared with a machete. A zigzag pattern through the property boundary was taken starting from southwest to northeast and all surrounding roads were driven or walked. Figure 3 presents the path walked and other notable features. Photographs from the site reconnaissance are presented in Appendix B.

5.2 General Site Setting

The subject property was located west of the UOG. The eastern portion of the property is accessible from University Avenue, from the intersection with College Lane to the intersection with Atbut Lane (Photograph 1). The southern portion of the property is accessible from Atbut Lane which is located along the property boundary on the south (Photograph 2). Densely vegetated forested areas were observed throughout the property.

The adjoining properties to the north, south, and west were undeveloped forested areas (Photograph 3). The adjoining properties to the south and southwest were residential areas and contained three two-story apartment buildings and two single-family dwellings (Photographs 4-7). The adjoining property to the east was the UOG and consisted of a landscaped area, parking lots, and the main campus (Photographs 8-9).

5.3 Exterior Observations

At the time of the site reconnaissance, the subject property was densely vegetated (Photograph 10). Uprooted trees were observed in the central area of the property (Photograph 11). There was a dump area, including a refrigerator and other municipal solid wastes, at the southwestern portion of the property, in front of a apartment building along Atbut Lane (Photographs 12-13).

Three telephone junction boxes were observed along University Avenue, to the northwest of the subject property. The junction boxes were observed in good condition (Photograph 14).

5.4 Interior Observations

There were no interior building spaces at the subject property. As a result, no interior observations were made.

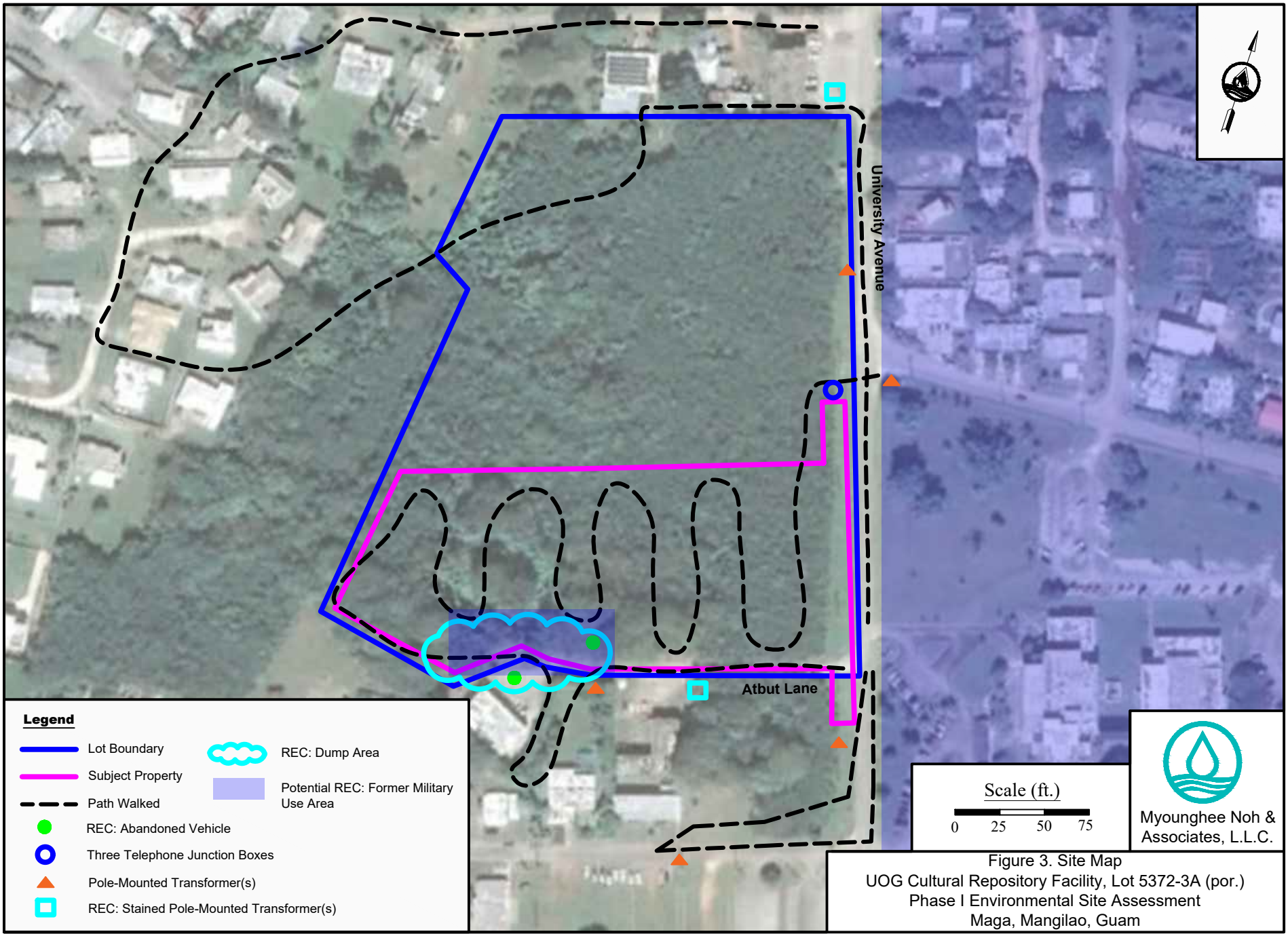

Figure 3. Site Map
UOG Cultural Repository Facility, Lot 5372-3A (por.)
Phase I Environmental Site Assessment
Maga, Mangilao, Guam

5.5 Hazardous Substances and Petroleum Products

Two abandoned vehicles were observed in the southwestern portion of the subject property. One of the vehicles was observed in poor condition and was overgrown with vines (Photograph 15). The ground surface around and beneath the vehicle could not be inspected due to the vegetative ground cover. The other vehicle was observed in moderate condition, with no fluid leaks or staining visible around or under the vehicle (Photograph 16).

Four pole-mounted transformers were observed in fair condition along University Avenue. One of the transformers had black staining on the exterior (Photograph 17). Five pole-mounted transformers, located on three poles, were observed to the south and southeast of the subject property. One of these transformers, located to the south of the subject property at an apartment building, had black staining on the exterior (Photograph 18).

5.6 Aboveground and Underground Storage Tanks

MNA did not observe any indications of aboveground or underground storage tanks or associated accessories, such as vent pipes, fill ports, or dispensers, on the subject property.

6.0 INTERVIEWS

MNA interviewed Sonny Perez, UOG Chief Plant Facilities Officer, and Robert McIntosh, UOG Capital Improvement Project Coordinator, via teleconference on 13 March 2019. The interview was administered by Jennah Oshiro of MNA. MNA also interviewed Joaquin Cruz and Kennally Erbai, residents of Mangilao, on 16 March 2019. The interviews were conducted in-person by Celeste Lim of MNA. Additionally, information was attained from Monique Storie, Ph.D., through email correspondence on 09 April 2019.

6.1 Sonny Perez and Robert McIntosh, University of Guam

Sonny Perez has been employed by the UOG since 2002, and Robert McIntosh has been with U since 1993. According to Messrs. Perez and McIntosh, the subject property has been undeveloped since at least 1993, with the exception of Atbut Lane. Atbut Lane is located on the southern boundary and is lined with utility poles.

Two 2-story apartment buildings are present to the south of the subject property. A commercial building and bus stop are present on the property to the north. UOG is located on the adjoining property to the east, with President's Grove, a tree-planted area, to the east and the UOG science building to the southeast. A residential area is located to the northeast. Messrs. Perez and McIntosh indicated that an electrical substation may have previously been located at President's Grove, on the adjoining property to the east.

Messrs. Perez and McIntosh were not aware of any specific chemicals, spills or releases, environmental cleanups or liens, or *activity and use limitations* for the subject property. They indicated that the subject property is zoned as residential and there is roadway easement on Atbut Lane. They were not aware of any previous environmental reports or documents for the subject property.

6.2 Joaquin Cruz, Resident

Joaquin Cruz has been a resident of Guam since 1957 and has been a resident of Mangilao since approximately 1979. Mr. Cruz stated that the UOG is primarily residential and was used as housing for workers of the United States Army Corps of Engineers.

Mr. Cruz indicated that there may be drums containing oil located on the southern portion of the subject property along Atbut Lane. Mr. Cruz was not aware of any spills or releases, environmental cleanups or liens, or *activity and use limitations* for the subject property. He was not aware of any previous environmental reports or documents for the subject property.

6.3 Kennally Erbai, Resident

Kennally Erbai has been a resident of the area since approximately 1989. He indicated that the subject property has been an empty lot since 1989. The adjoining property to the south has been used as UOG housing since the 1960s. The property to the north of Lot 5372-3A is owned by a Saipan resident.

Mr. Erbai was not aware of any specific chemicals, spills or releases, environmental cleanups or liens, or *activity and use limitations* for the subject property. He was not aware of any previous environmental reports or documents for the subject property.

6.4 Monique Storie, PhD, University of Guam

Dr. Monique Carriveau Storie is the Dean of University Libraries and indicated that the adjoining property to the east of the subject property, across University Avenue, was formerly Quonset huts used for military housing.

7.0 DATA GAPS AND DEVIATIONS

MNA submitted a records request to the GPA on 17 April 2019 and followed up on 01 May 2018. The GPA responded on 12 May 2019 that there were no GPA transformers at the subject or adjoining properties, at the locations noted on an MNA provided map. A follow-up email was sent to GPA in regards to the observed transformers on the adjoining properties. Reponses from the GPA was pending at the time of this writing. Nine pole-mounted transformers were observed on adjoining properties during the site reconnaissance. This is considered a major data gap, as two of the transformers had visible staining on their exteriors and their PCB status is unknown.

MNA submitted a FOIA request to the GEPA on 16 April 2019 and followed up on 01 May 2018. The GEPA responded on 01 May 2018 and provided information from the Hazardous Waste Management Program. GEPA indicated that all other GEPA programs' response was pending. This was considered a minor data gap because the subject property was not listed on any environmental databases and no previous reports or documents were indicated by the user questionnaire.

MNA visited the Guam Department of Land Management during 14-15 March and 09 May 2019 to access property tax records. Tax records were not available for review despite the three visits and numerous emails to the department. This was considered a minor data gap, as the subject

property has been owned by the Government of Guam since 1964 and land use information of the subject and adjoining properties was collected through review of historical aerial photographs, topographic maps, online research, and reports, as well as from interviews.

Based on the size and forested nature of the subject property, not all areas of the subject property were observed during the site reconnaissance. MNA cleared and walked through the subject property in a zigzag pattern and also walked along roadways and driveways. This was considered a major limitation within the dump area, as thorough inspection of the area and ground surface was not possible due to thick vegetation cover. In other areas of the subject property, this was considered a minor limitation, as the primary concern was illegal dumping, and these areas were not easily accessible to the public due to the lack of trails and driveways, as well as the presence of thick vegetation.

8.0 KEY FINDINGS AND OPINION

This section evaluates the key findings of this assessment and makes a determination as to the presence of *RECs*, if any.

8.1 SUBJECT PROPERTY

No environmental records were found in NPL sites, Federal RCRA CORRACTS and Non-CORRACTS Treatment Storage Disposal Facilities, Delisted NPL sites, Federal CERCLIS sites, Federal SEMS-Archive sites, State registered UST sites, State registered leaking UST sites, RCRA Generators List, Federal engineering control/institutional control registries, Federal Emergency Response Notification System list sites, Federal Brownfields sites, or Federal ERNS sites were identified at the subject property.

MNA requested information about any releases of hazardous materials or petroleum products as well as other environmental hazards on the subject property from the GPA, Guam Fire Department, and GEPA. The GPA indicated that there were no transformers on the subject property. The Guam Fire Department indicated no files for the subject property. The GEPA indicated that there were no files for the subject property under the Hazardous Waste Management Program, but that they were reviewing for records from other programs at the time of this writing.

8.1.1 Non-REC

Joaquin Cruz indicated during an interview on 16 March 2019 that drums containing oil may be present on the southern portion of the subject property along Atbut Lane. No drums were observed during the site reconnaissance in this or other portions of the subject property. As a result, this is not a REC.

8.1.2 REC

Two abandoned vehicles, appliances, and other municipal solid waste were observed on the southwestern portion of the subject property. The subject property was also heavily vegetated preventing a thorough inspection of the dump area. It is likely that hazardous materials or petroleum products have leaked from the abandoned vehicles but were not visible due to the heavy

vegetation cover, and that additional hazardous materials or petroleum products may have been dumped in the area but were not visible. This could lead a REC.

The southern portion of the subject property was used as Quonset hut housing for the military during the post-World War II construction boom. Insufficient information is available for land use by the military. The past occupancy of the subject property by the military and undocumented land use activities which may have impacted the property could lead to a REC.

8.2 SURROUNDING AREA

No environmental records were found in NPL sites, Federal RCRA CORRACTS and Non-CORRACTS Treatment Storage Disposal Facilities, Delisted NPL sites, Federal CERCLIS sites, Federal SEMS-Archive sites, State registered leaking UST sites, Federal engineering control/institutional control registries, Federal Emergency Response Notification System list sites, Federal Brownfields sites, or Federal ERNS sites were identified at the surrounding properties.

MNA requested information about any releases of hazardous materials or petroleum products as well as other environmental hazards on the adjoining properties property from the GPA and GEPA. The GPA indicated that there were no transformers on the adjoining properties. The GEPA indicated that there were no files for the adjoining properties under the Hazardous Waste Management Program, but that they were reviewing for records from other programs at the time of this writing.

8.2.1 Non-REC

The UOG Station was identified as a RCRA LQG and UST site and is located 1,230 feet east northeast and upgradient of the subject property. The UOG Station had three violations reported as a LQG. Three USTs were associated with the UOG Station. Based on a data provided by the environmental database search, there have been no reported releases of hazardous substances or petroleum products from the UOG Station. As a result, the UOG Station is not considered a REC.

8.2.2 REC

Two pole-mounted transformers were observed on the adjoining properties in fair condition. Black staining was observed on the exterior of the transformers indicating a potential release. The GPA responded that there were no transformers at the adjoining properties. As a result, it is not known if the transformers are PCB-containing. Based on the condition of the transformers, and the lack of information regarding their PCB status, the two transformers could lead to a REC.

Mangilao underwent a large population influx during the post-World War II construction boom and supported one of the many post-invasion U.S. military installations on the island. The Marine Corps Headquarters and Artillery was established in the present UOG area. Additionally, the adjoining property to the east of the subject property was used as Quonset hut housing. Review of historical aerial photographs also show small structures and cleared areas within the vegetated areas on the adjoining properties to the north, west, and south. It is not known if these forested areas were utilized by the military and if hazardous substances and/or petroleum products were used on the adjoining properties during military occupancy. The past occupancy of the adjoining

properties by the U.S. Marine Corps and the undocumented land use activities which may have impacted the subject property could lead to a REC.

9.0 CONCLUSION

MNA performed a *Phase I Environmental Site Assessment* in conformance with the scope and limitations of ASTM E 1527-13 of the 5-acre subject property of Lot 5372-3A located in Maga, Mangilao, Guam. At this writing, there was no evidence of RECs, except the following:

- A high likelihood of releases of hazardous substances and/or petroleum products to the subject property based on the observation of two abandoned vehicles, appliances, and municipal solid wastes observed at the subject property.
- Two transformers with visible exterior staining and no information regarding their PCB status.
- The land use of the subject and adjoining properties by the U.S. Department of Defense during 1948-1953, which may have resulted in willful or accidental release or burial of hazardous substances/materials and/or petroleum products.

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APPENDIX A

Environmental Risk Information Services Report

ENVIRONMENTAL RISK INFORMATION SERVICES

DATABASE REPORT

Project Property:	*Guam* *Guam* *Harmon GU*
Project No:	
Report Type:	*Database Report*
Order No:	*20190220125*
Requested by:	*Myounghee Noh & Associates, L.L.C.*
Date Completed:	*February 22, 2019*

Environmental Risk Information Services
A division of Glacier Media Inc.
1.866.517.5204 | info@erisinfo.com | erisinfo.com

Table of Contents

Executive Summary

Property Information:

Project Property: *Guam*
Guam Harmon GU

Project No:

Coordinates:

Latitude:	*13.433362*
Longitude:	*144.799881*
UTM Northing:	*13.43*
UTM Easting:	*144.80*
UTM Zone:	*UTM Zone 55P*

Elevation: *230 FT*

Order Information:

Order No: *20190220125*
Date Requested: *February 20, 2019*
Requested by: *Myounghee Noh & Associates, L.L.C.*
Report Type: *Database Report*

Historicals/Products:

Executive Summary: Report Summary

Database	Searched	Search Radius	Project Property	Within 0.12mi	.125mi to 0.25mi	0.25mi to 0.50mi	0.50mi to 1.00mi	Total
Standard Environmental Records								
Federal								
NPL	Y	1	0	0	0	0	0	0
PROPOSED NPL	Y	1	0	0	0	0	0	0
DELETED NPL	Y	.5	0	0	0	0	-	0
SEMS	Y	.5	0	0	0	0	-	0
ODI	Y	.5	0	0	0	0	-	0
SEMS ARCHIVE	Y	.5	0	0	0	0	-	0
CERCLIS	Y	.5	0	0	0	0	-	0
IODI	Y	.5	0	0	0	0	-	0
CERCLIS NFRAP	Y	.5	0	0	0	0	-	0
CERCLIS LIENS	Y	PO	0	-	-	-	-	0
RCRA CORRACTS	Y	1	0	0	0	0	0	0
RCRA TSD	Y	.5	0	0	0	0	-	0
RCRA LQG	Y	.25	0	0	1	-	-	1
RCRA SQG	Y	.25	0	0	0	-	-	0
RCRA CESQG	Y	.25	0	0	0	-	-	0
RCRA NON GEN	Y	.25	0	0	0	-	-	0
FED ENG	Y	.5	0	0	0	0	-	0
FED INST	Y	.5	0	0	0	0	-	0
ERNS 1982 TO 1986	Y	PO	0	-	-	-	-	0
ERNS 1987 TO 1989	Y	PO	0	-	-	-	-	0
ERNS	Y	PO	0	-	-	-	-	0
FED BROWNFIELDS	Y	.5	0	0	0	0	-	0
FEMA UST	Y	.25	0	0	0	-	-	0
SEMS LIEN	Y	PO	0	-	-	-	-	0
SUPERFUND ROD	Y	1	0	0	0	0	0	0
State								
LUST	Y	.5	0	0	0	0	-	0

Database	Searched	Search Radius	Project Property	Within 0.12mi	.125mi to 0.25mi	0.25mi to 0.50mi	0.50mi to 1.00mi	Total
UST	Y	.25	0	0	1	-	-	1

Tribal ***No Tribal standard environmental record sources available for this State.***

County ***No County standard environmental record sources available for this State.***

Additional Environmental Records

Federal

FINDS/FRS	Y	PO	0	-	-	-	-	0
TRIS	Y	PO	0	-	-	-	-	0
HMIRS	Y	.125	0	0	-	-	-	0
NCDL	Y	PO	0	-	-	-	-	0
TSCA	Y	.125	0	0	-	-	-	0
HIST TSCA	Y	.125	0	0	-	-	-	0
FTTS ADMIN	Y	PO	0	-	-	-	-	0
FTTS INSP	Y	PO	0	-	-	-	-	0
PRP	Y	PO	0	-	-	-	-	0
SCRD DRYCLEANER	Y	.5	0	0	0	0	-	0
ICIS	Y	PO	0	-	-	-	-	0
FED DRYCLEANERS	Y	.25	0	0	0	-	-	0
DELISTED FED DRY	Y	.25	0	0	0	-	-	0
FUDS	Y	1	0	0	0	0	0	0
MLTS	Y	PO	0	-	-	-	-	0
HIST MLTS	Y	PO	0	-	-	-	-	0
MINES	Y	.25	0	0	0	-	-	0
ALT FUELS	Y	.25	0	0	0	-	-	0
SSTS	Y	.25	0	0	0	-	-	0
PCB	Y	.5	0	0	0	0	-	0

State ***No State additional environmental record sources available for this State.***

Tribal ***No Tribal additional environmental record sources available for this State.***

County ***No County additional environmental record sources available for this State.***

Total:	0	0	2	0	0	2

**** PO – Property Only***
**** 'Property and adjoining properties' database search radii are set at 0.25 miles.***

Executive Summary: Site Report Summary - Project Property

Map Key	DB	Company/Site Name	Address	Direction	Distance (mi/ft)	Elev Diff (ft)	Page Number

No records found in the selected databases for the project property.

Executive Summary: Site Report Summary - Surrounding Properties

Map Key	DB	Company/Site Name	Address	Direction	Distance (mi/ft)	Elev Diff (ft)	Page Number
1	RCRA LQG	UNIVERSITY OF GUAM	UOG STATION MANGILAO GU 96923	ESE	0.23 / 1230.80	16	14
1	UST	University of Guam	UOG Station Mangilao GU	ESE	0.23 / 1230.80	16	17

Executive Summary: Summary by Data Source

Standard

Federal

RCRA LQG - RCRA Generator List

A search of the RCRA LQG database, dated Dec 17, 2018 has found that there are 1 RCRA LQG site(s) within approximately 0.25 miles of the project property.

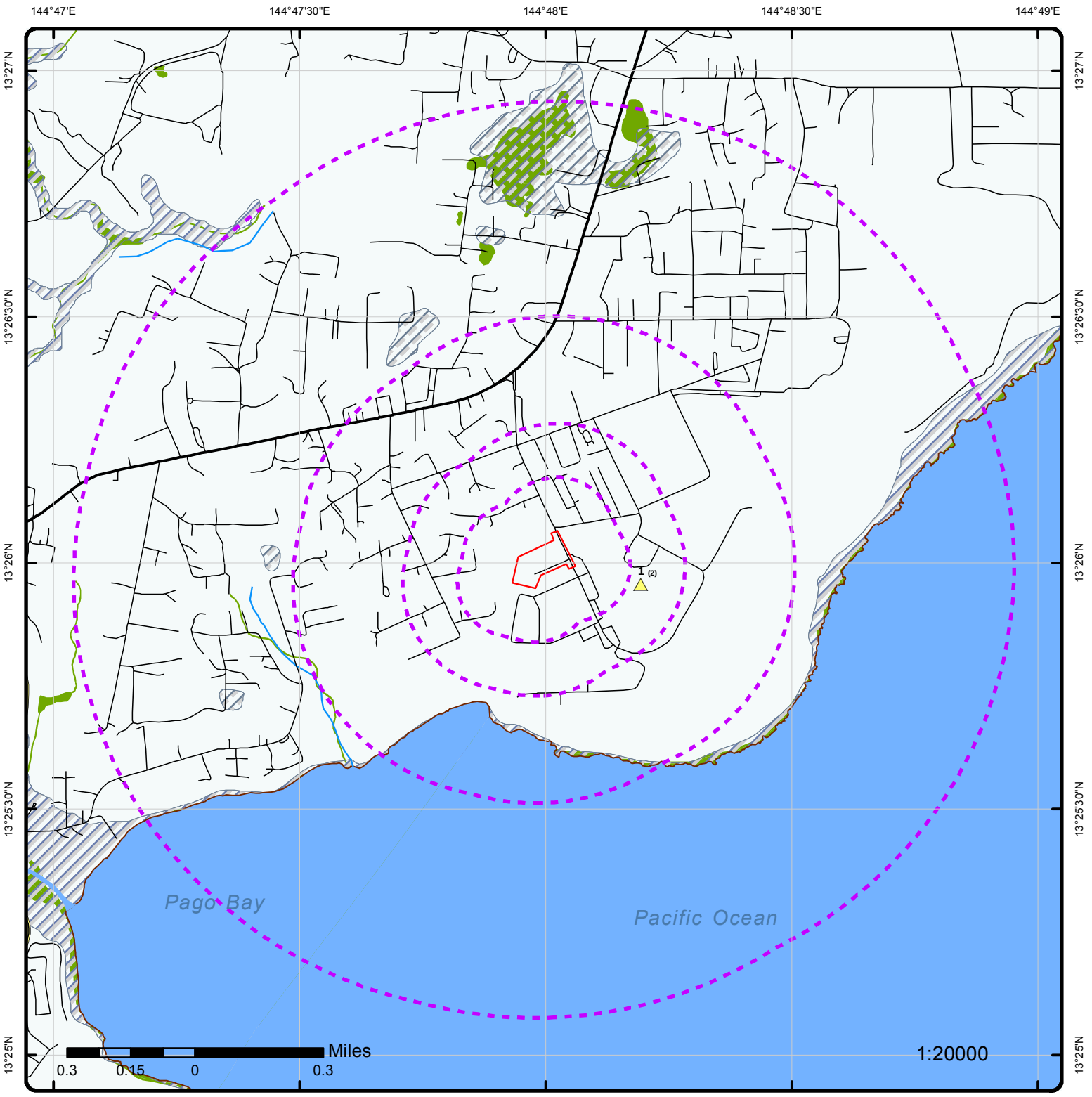
Equal/Higher Elevation	Address	Direction	Distance (mi/ft)	Map Key
UNIVERSITY OF GUAM	UOG STATION MANGILAO GU 96923	ESE	0.00 / 0.01	1

State

UST - Underground Storage Tanks

A search of the UST database, dated Jun 30, 2018 has found that there are 1 UST site(s) within approximately 0.25 miles of the project property.

Equal/Higher Elevation	Address	Direction	Distance (mi/ft)	Map Key
University of Guam	UOG Station Mangilao GU	ESE	0.00 / 0.01	1



Map : 1 Mile Radius

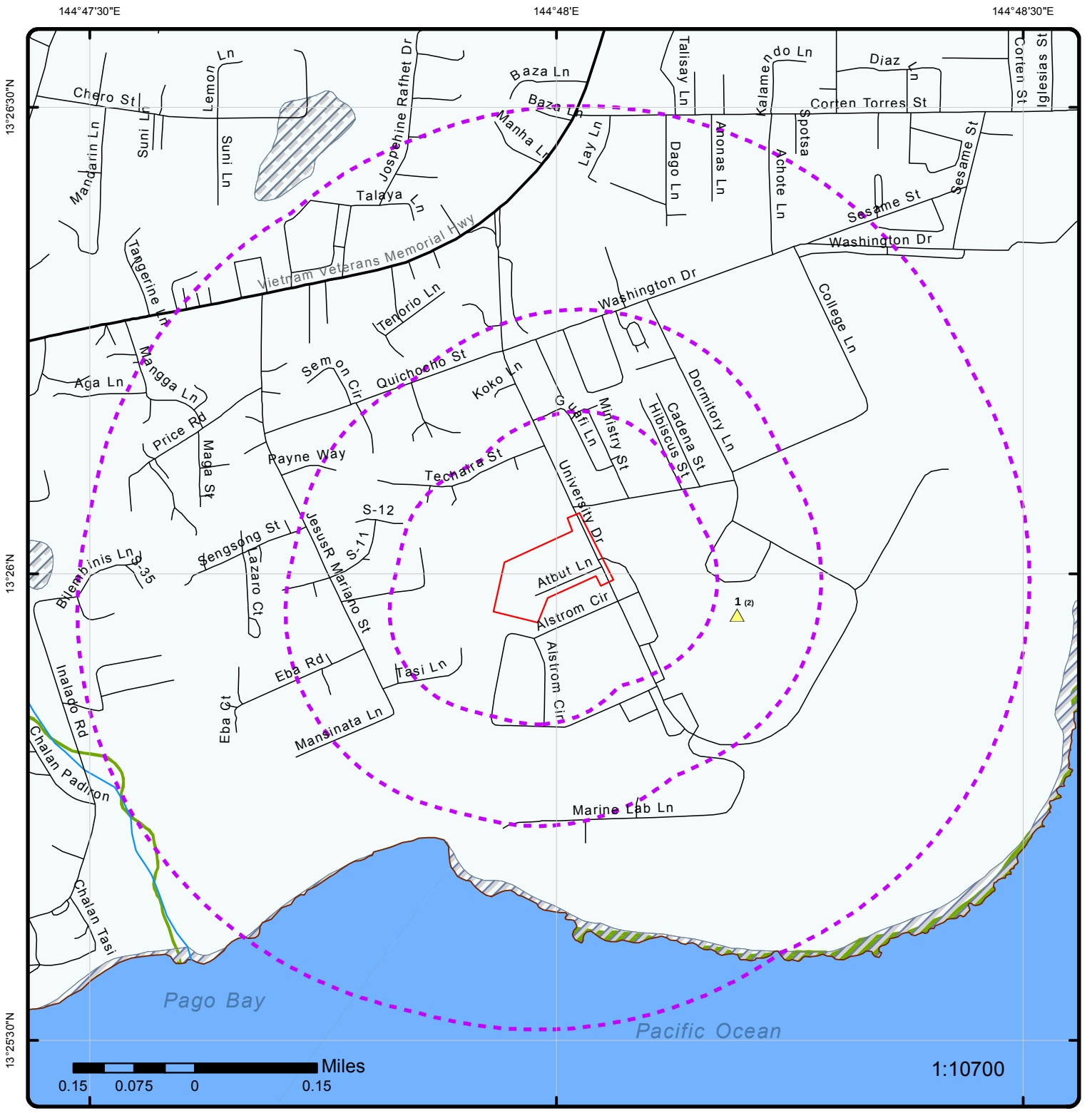
Order No: 20190220125

Address: Guam, Harmon, GU US

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Project Property	Rails	State Boundary	FWS Special Designation Areas
Buffer Outline	Major Highways	National Priority List Sites	State Brownfield Sites
Eris Sites with Higher Elevation	Major Highways Ramps	National Wetland	State Brownfield Areas
Eris Sites with Same Elevation	Major Roads	Indian Reserve Land	State Superfund Areas:Dept. of Defense
Eris Sites with Lower Elevation	Major Roads Ramps	Historic Fill	State Superfund Areas:NPL
Eris Sites with Unknown Elevation	Secondary Roads	100 Year Flood Zone	WQARF Areas
County Boundary	Secondary Roads Ramps	500 Year Flood Zone	Federal Lands: Dept. of Defense (owned/administered areas)
	Local Roads and Ramps		

Source: © 2016 ESRI



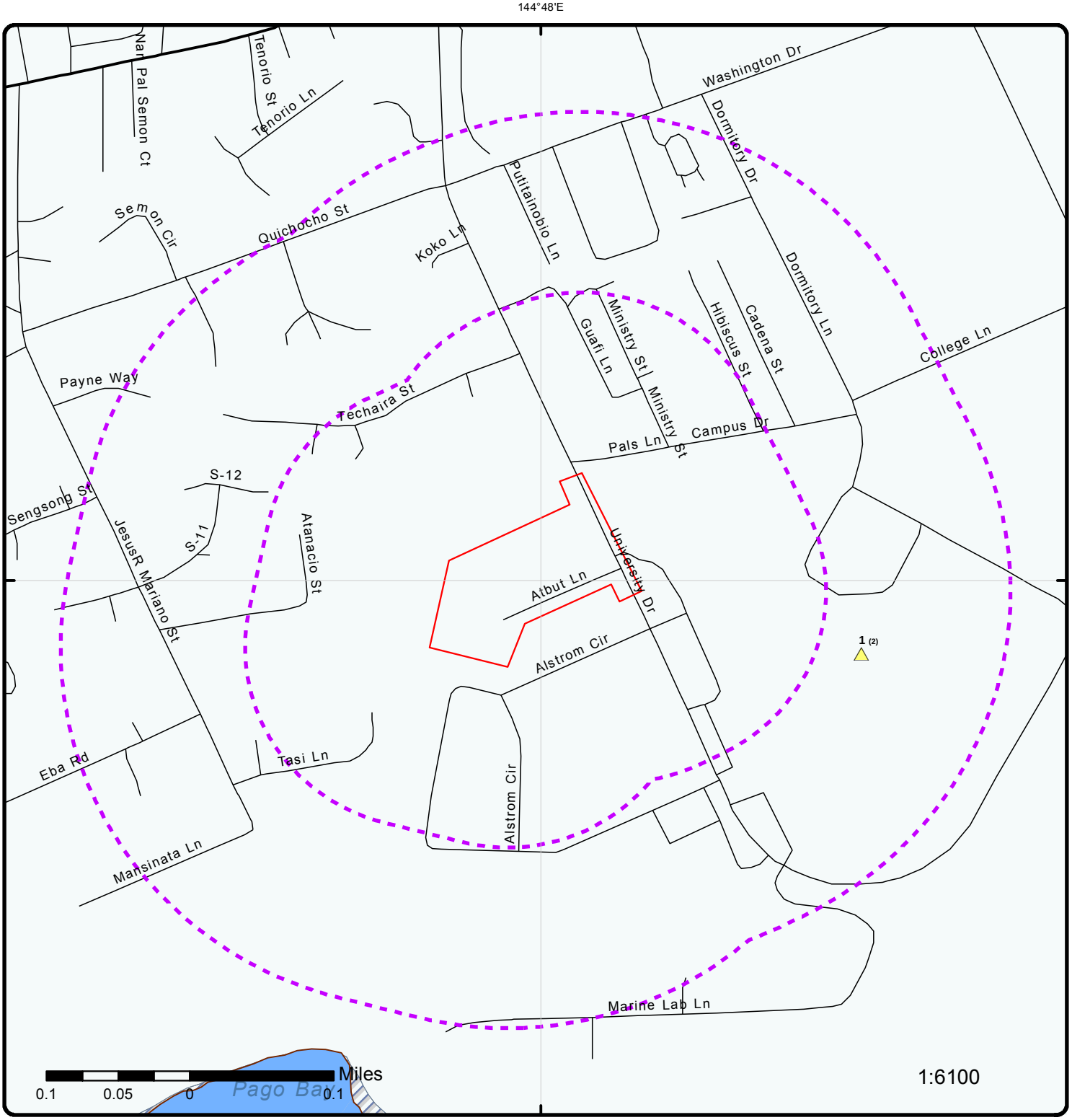
Map : .5 Mile Radius

Order No: 20190220125

Address: Guam, Harmon, GU US

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Project Property	Rails	State Boundary	FWS Special Designation Areas
Buffer Outline	Major Highways	National Priority List Sites	State Brownfield Sites
Eris Sites with Higher Elevation	Major Highways Ramps	National Wetland	State Brownfield Areas
Eris Sites with Same Elevation	Major Roads	Indian Reserve Land	State Superfund Areas:Dept. of Defense
Eris Sites with Lower Elevation	Major Roads Ramps	Historic Fill	State Superfund Areas:NPL
Eris Sites with Unknown Elevation	Secondary Roads	100 Year Flood Zone	WQARF Areas
County Boundary	Secondary Roads Ramps	500 Year Flood Zone	Federal Lands: Dept. of Defense (owned/administered areas)
	Local Roads and Ramps		



Map : .25 Mile Radius

Order No: 20190220125

Address: Guam, Harmon, GU US

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

- Project Property
- **Buffer Outline**
- Eris Sites with Higher Elevation
- Eris Sites with Same Elevation
- Eris Sites with Lower Elevation
- Eris Sites with Unknown Elevation
- County Boundary
- Rails
- Major Highways
- Major Highways Ramps
- Major Roads
- Major Roads Ramps
- Secondary Roads
- Secondary Roads Ramps
- Local Roads and Ramps
- State Boundary
- National Priority List Sites
- National Wetland
- Indian Reserve Land
- Historic Fill
- 100 Year Flood Zone
- 500 Year Flood Zone
- FWS Special Designation Areas
- State Brownfield Sites
- State Brownfield Areas
- State Superfund Areas:Dept. of Defense
- State Superfund Areas:NPL
- WQARF Areas
- Federal Lands: Dept. of Defense (owned/administered areas)

Source: © 2016 ESRI

144°48'E

13°26'N

13°26'N

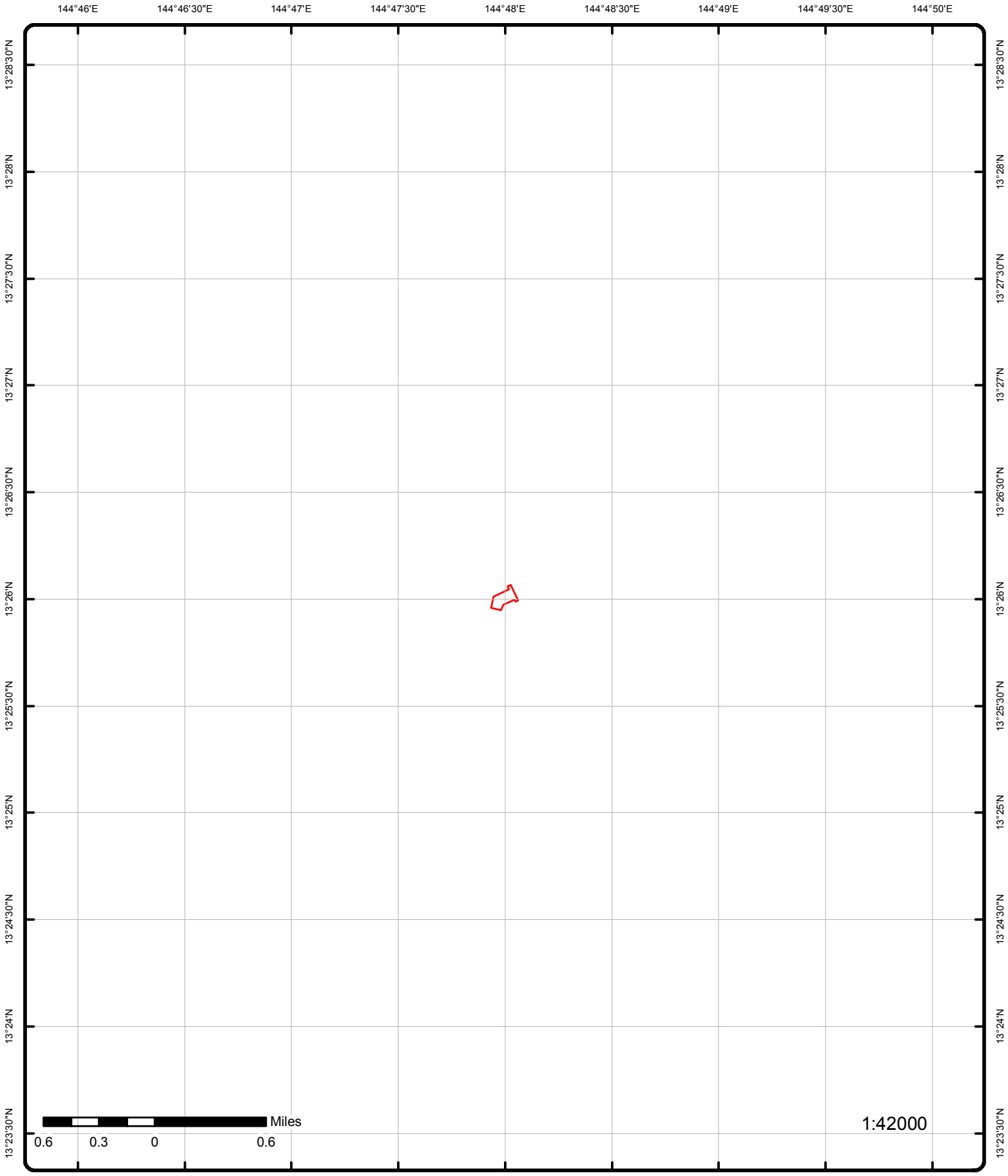
Aerial (2016)

Order No: 20190220125

Address: Guam, Harmon, GU US

Source: ESRI World Imagery

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES



Topographic Map

Address: Guam, Harmon, GU US

Order No: 20190220125

ENVIRONMENTAL RISK INFORMATION SERVICES

Source: USGS Topographic Map

Detail Report

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
1	1 of 2	ESE	0.23 / 1230.80	245.17 / 16	UNIVERSITY OF GUAM UOG STATION MANGILAO GU 96923	RCRA LQG

EPA Handler ID: GU0000286427
Gen Status Universe: Large Quantity Generator
Contact Name: JENNIFER O CRUZ
Contact Address: UOG STATION , , MANGILAO , GU, 96923 , US
Contact Phone No and Ext: 671-735-2688
Contact Email: JENCRUZ@TRITON.UOG.EDU
Contact Country: US
County Name: GUAM
EPA Region: 09
Land Type: State
Receive Date: 20180402

Violation/Evaluation Summary

Note: VIOLATION or UNDETERMINED: There are VIOLATION or UNDETERMINED details or records associated with this facility (EPA ID) in the Compliance Monitoring and Enforcement table dated Dec, 2018.

Violation Details

Citation:
Violation Short Description: Federal or State Statute
Violation Type: FSS
Violation Determined Date: 20090210
Scheduled Compliance Date:
Return To Compliance Qualifier: O
Actual Return to Compl: 20090430
Violation Responsible Agency: State

Violation Details

Citation:
Violation Short Description: Generators - General
Violation Type: 262.A
Violation Determined Date: 20040309
Scheduled Compliance Date:
Return To Compliance Qualifier: D
Actual Return to Compl: 20080228
Violation Responsible Agency: EPA

Enforcement Details

Enforcement Type: 386
Enforcement Type Description:
Enforcement Action Date: 20040715
Enf Disposition Status:
Disposition Status Date:
Enforcement Lead Agency: EPA
Proposed Penalty Amount:
Final Amount:

Paid Amount:

Enforcement Type: 386
Enforcement Type Description:
Enforcement Action Date: 20040426
Enf Disposition Status:
Disposition Status Date:
Enforcement Lead Agency: EPA
Proposed Penalty Amount:
Final Amount:
Paid Amount:

Enforcement Type: 114
Enforcement Type Description:
Enforcement Action Date: 20040803
Enf Disposition Status:
Disposition Status Date:
Enforcement Lead Agency: EPA
Proposed Penalty Amount:
Final Amount:
Paid Amount:

Violation Details

Citation:
Violation Short Description: Generators - General
Violation Type: 262.A
Violation Determined Date: 20040309
Scheduled Compliance Date: 20080228
Return To Compliance Qualifier: D
Actual Return to Compl: 20080228
Violation Responsible Agency: EPA

Enforcement Details

Enforcement Type: 312
Enforcement Type Description:
Enforcement Action Date: 20080228
Enf Disposition Status: ACTION SATISFIED (CASE CLOSED)
Disposition Status Date: 20080228
Enforcement Lead Agency: EPA
Proposed Penalty Amount:
Final Amount:
Paid Amount:

Evaluation Details

Evaluation Start Date: 20080221
Evaluation Type Description: NOT A SIGNIFICANT NON-COMPLIER
Violation Short Description:
Return to Compliance Date:
Evaluation Agency: EPA

Evaluation Start Date: 20040309
Evaluation Type Description: COMPLIANCE EVALUATION INSPECTION ON-SITE
Violation Short Description: Generators - General
Return to Compliance Date: 20080228
Evaluation Agency: EPA

Evaluation Start Date: 20090210
Evaluation Type Description: COMPLIANCE EVALUATION INSPECTION ON-SITE
Violation Short Description: Federal or State Statute
Return to Compliance Date: 20090430
Evaluation Agency: State

Evaluation Start Date: 20040309
Evaluation Type Description: SIGNIFICANT NON-COMPLIER
Violation Short Description: Generators - General
Return to Compliance Date: 20080228
Evaluation Agency: EPA

Handler Summary

Importer Activity: No
Mixed Waste Generator: No
Transporter Activity: No
Transfer Facility: No
Onsite Burner Exemption: No
Furnace Exemption: No
Underground Injection Activity: No
Commercial TSD: No
Used Oil Transporter: No
Used Oil Transfer Facility: No
Used Oil Processor: No
Used Oil Refiner: No
Used Oil Burner: No
Used Oil Market Burner: No
Used Oil Spec Marketer: No

Hazardous Waste Handler Details

Sequence No: 1
Receive Date: 20180402
Handler Name: UNIVERSITY OF GUAM
Generator Status Universe: Large Quantity Generator
Source Type: Annual/Biennial Report update with Notification

Waste Code Details

Hazardous Waste Code: F002
Waste Code Description: THE FOLLOWING SPENT HALOGENATED SOLVENTS: TETRACHLOROETHYLENE, METHYLENE CHLORIDE, TRICHLOROETHYLENE, 1,1,1-TRICHLOROETHANE, CHLOROBENZENE, 1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE, ORTHO-DICHLOROBENZENE, TRICHLOROFLUOROMETHANE, AND 1,1,2, TRICHLOROETHANE; ALL SPENT SOLVENT MIXTURES/BLENDS CONTAINING, BEFORE USE, A TOTAL OF TEN PERCENT OR MORE (BY VOLUME) OF ONE OR MORE OF THE ABOVE HALOGENATED SOLVENTS OR THOSE SOLVENTS LISTED IN F001, F004, AND F005; AND STILL BOTTOMS FROM THE RECOVERY OF THESE SPENT SOLVENTS AND SPENT SOLVENT MIXTURES.

Hazardous Waste Code: D001
Waste Code Description: IGNITABLE WASTE

Hazardous Waste Code: D002
Waste Code Description: CORROSIVE WASTE

Hazardous Waste Handler Details

Sequence No: 1
Receive Date: 19940112
Handler Name: UNIVERSITY OF GUAM MANGILAO
Generator Status Universe: Large Quantity Generator
Source Type: Notification

Owner/Operator Details

Owner/Operator Ind: Current Owner
Type: State
Name: UNIVERSITY OF GUAM
Street No:
Street 1: UOG STATION
Street 2:

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB

Date Became Current:	19600101	**City:**	MANGILAO
Date Ended Current:		**State:**	GU
Phone:	671-734-9372	**Country:**	US
Source Type:	Annual/Biennial Report update with Notification	**Zip Code:**	96923
Owner/Operator Ind:	Current Owner	**Street No:**	
Type:	Municipal	**Street 1:**	U O G STATION
Name:	UNIVERSITY OF GUAM	**Street 2:**	
Date Became Current:		**City:**	MANGILAO
Date Ended Current:		**State:**	GU
Phone:	671-734-9372	**Country:**	
Source Type:	Notification	**Zip Code:**	96923
Owner/Operator Ind:	Current Operator	**Street No:**	
Type:	State	**Street 1:**	UOG STATION
Name:	UNIVERSITY OF GUAM	**Street 2:**	MANGILAO
Date Became Current:	19600101	**City:**	MANGILAO
Date Ended Current:		**State:**	GU
Phone:		**Country:**	US
Source Type:	Annual/Biennial Report update with Notification	**Zip Code:**	96923

1	2 of 2	ESE	0.23 / 1230.80	245.17 / 16	**University of Guam** **UOG Station** **Mangilao GU**	UST

Permit No:	GEPA-UST-099
Owner:	Government of Guam
Tank Capacity Substance:	T1-4000 Diesel T2-2500 Diesel 11/95 T3-2500 Diesel 12/06
Date Installed:	01-Nov-91
Facility Desc:	State Government

Unplottable Summary

Total: 0 Unplottable sites

DB	Company Name/Site Name	Address	City	Zip	ERIS ID

No unplottable records were found that may be relevant for the search criteria.

Unplottable Report

No unplottable records were found that may be relevant for the search criteria.

Appendix: Database Descriptions

Environmental Risk Information Services (ERIS) can search the following databases. The extent of historical information varies with each database and current information is determined by what is publicly available to ERIS at the time of update. ERIS updates databases as set out in ASTM Standard E1527-13, Section 8.1.8 Sources of Standard Source Information:

"Government information from nongovernmental sources may be considered current if the source updates the information at least every 90 days, or, for information that is updated less frequently than quarterly by the government agency, within 90 days of the date the government agency makes the information available to the public."

Standard Environmental Record Sources

Federal

National Priority List: NPL

National Priorities List (Superfund)-NPL: EPA's (United States Environmental Protection Agency) list of the most serious uncontrolled or abandoned hazardous waste sites identified for possible long-term remedial action under the Superfund program. The NPL, which EPA is required to update at least once a year, is based primarily on the score a site receives from EPA's Hazard Ranking System. A site must be on the NPL to receive money from the Superfund Trust Fund for remedial action.

Government Publication Date: Dec 12, 2018

National Priority List - Proposed: PROPOSED NPL

Includes sites proposed (by the EPA, the state, or concerned citizens) for addition to the NPL due to contamination by hazardous waste and identified by the Environmental Protection Agency (EPA) as a candidate for cleanup because it poses a risk to human health and/or the environment.

Government Publication Date: Dec 12, 2018

Deleted NPL: DELETED NPL

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425.(e), sites may be deleted from the NPL where no further response is appropriate.

Government Publication Date: Dec 12, 2018

SEMS List 8R Active Site Inventory: SEMS

The Superfund Program has deployed the Superfund Enterprise Management System (SEMS), which integrates multiple legacy systems into a comprehensive tracking and reporting tool. This inventory contains active sites evaluated by the Superfund program that are either proposed to be or are on the National Priorities List (NPL) as well as sites that are in the screening and assessment phase for possible inclusion on the NPL. The Active Site Inventory Report displays site and location information at active SEMS sites. An active site is one at which site assessment, removal, remedial, enforcement, cost recovery, or oversight activities are being planned or conducted.

Government Publication Date: Nov 14, 2018

Inventory of Open Dumps, June 1985: ODI

The Resource Conservation and Recovery Act (RCRA) provides for publication of an inventory of open dumps. The Act defines "open dumps" as facilities which do not comply with EPA's "Criteria for Classification of Solid Waste Disposal Facilities and Practices" (40 CFR 257).

Government Publication Date: Jun 1985

SEMS List 8R Archive Sites: SEMS ARCHIVE

The Superfund Enterprise Management System (SEMS) Archived Site Inventory displays site and location information at sites archived from SEMS. An archived site is one at which EPA has determined that assessment has been completed and no further remedial action is planned under the Superfund program at this time.

Government Publication Date: Nov 14, 2018

Comprehensive Environmental Response, Compensation and Liability Information System - CERCLIS: CERCLIS

Superfund is a program administered by the United States Environmental Protection Agency (EPA) to locate, investigate, and clean up the worst hazardous waste sites throughout the United States. CERCLIS is a database of potential and confirmed hazardous waste sites at which the EPA Superfund program has some involvement. It contains sites that are either proposed to be or are on the National Priorities List (NPL) as well as sites that are in the screening and assessment phase for possible inclusion on the NPL. The EPA administers the Superfund program in cooperation with individual states and tribal governments; this database is made available by the EPA.

Government Publication Date: Oct 25, 2013

EPA Report on the Status of Open Dumps on Indian Lands: IODI

Public Law 103-399, The Indian Lands Open Dump Cleanup Act of 1994, enacted October 22, 1994, identified congressional concerns that solid waste open dump sites located on American Indian or Alaska Native (AI/AN) lands threaten the health and safety of residents of those lands and contiguous areas. The purpose of the Act is to identify the location of open dumps on Indian lands, assess the relative health and environment hazards posed by those sites, and provide financial and technical assistance to Indian tribal governments to close such dumps in compliance with Federal standards and regulations or standards promulgated by Indian Tribal governments or Alaska Native entities.

Government Publication Date: Dec 31, 1998

CERCLIS - No Further Remedial Action Planned: CERCLIS NFRAP

An archived site is one at which EPA has determined that assessment has been completed and no further remedial action is planned under the Superfund program at this time. The Archive designation means that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to list this site on the National Priorities List (NPL). This decision does not necessarily mean that there is no hazard associated with a given site; it only means that, based upon available information, the location is not judged to be a potential NPL site.

Government Publication Date: Oct 25, 2013

CERCLIS Liens: CERCLIS LIENS

A Federal Superfund lien exists at any property where EPA has incurred Superfund costs to address contamination ("Superfund site") and has provided notice of liability to the property owner. A Federal CERCLA ("Superfund") lien can exist by operation of law at any site or property at which EPA has spent Superfund monies. This database is made available by the United States Environmental Protection Agency (EPA).

Government Publication Date: Jan 30, 2014

RCRA CORRACTS-Corrective Action: RCRA CORRACTS

RCRA Info is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. At these sites, the Corrective Action Program ensures that cleanups occur. EPA and state regulators work with facilities and communities to design remedies based on the contamination, geology, and anticipated use unique to each site.

Government Publication Date: Dec 17, 2018

RCRA non-CORRACTS TSD Facilities: RCRA TSD

RCRA Info is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. This database includes Non-Corrective Action sites listed as treatment, storage and/or disposal facilities of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA).

Government Publication Date: Dec 17, 2018

RCRA Generator List: RCRA LQG

RCRA Info is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. RCRA Info replaces the data recording and reporting abilities of the Resource Conservation and Recovery Information System (RCRIS) and the Biennial Reporting System (BRS). A hazardous waste generator is any person or site whose processes and actions create hazardous waste (see 40 CFR 260.10). Large Quantity Generators (LQGs) generate 1,000 kilograms per month or more of hazardous waste or more than one kilogram per month of acutely hazardous waste.

Government Publication Date: Dec 17, 2018

RCRA Small Quantity Generators List: RCRA SQG

RCRA Info is the EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. RCRA Info replaces the data recording and reporting abilities of the Resource Conservation and Recovery Information System (RCRIS) and the Biennial Reporting System (BRS). A hazardous waste generator is any person or site whose processes and actions create hazardous waste (see 40 CFR 260.10). Small Quantity Generators (SQGs) generate more than 100 kilograms, but less than 1,000 kilograms, of hazardous waste per month.

Government Publication Date: Dec 17, 2018

RCRA Conditionally Exempt Small Quantity Generators List: RCRA CESQG

RCRA Info is the EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. RCRA Info replaces the data recording and reporting abilities of the Resource Conservation and Recovery Information System (RCRIS) and the Biennial Reporting System (BRS). A hazardous waste generator is any person or site whose processes and actions create hazardous waste (see 40 CFR 260.10). Conditionally Exempt Small Quantity Generators (CESQG) generate 100 kilograms or less per month of hazardous waste or one kilogram or less per month of acutely hazardous waste.

Government Publication Date: Dec 17, 2018

RCRA Non-Generators: RCRA NON GEN

RCRA Info is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. RCRA Info replaces the data recording and reporting abilities of the Resource Conservation and Recovery Information System (RCRIS) and the Biennial Reporting System (BRS). A hazardous waste generator is any person or site whose processes and actions create hazardous waste (see 40 CFR 260.10). Non-Generators do not presently generate hazardous waste.

Government Publication Date: Dec 17, 2018

Federal Engineering Controls-ECs: FED ENG

Engineering controls (ECs) encompass a variety of engineered and constructed physical barriers (e.g., soil capping, sub-surface venting systems, mitigation barriers, fences) to contain and/or prevent exposure to contamination on a property. This database is made available by the United States Environmental Protection Agency (EPA).

Government Publication Date: Jan 20, 2016

Federal Institutional Controls- ICs: FED INST

Institutional controls are non-engineered instruments, such as administrative and legal controls, that help minimize the potential for human exposure to contamination and/or protect the integrity of the remedy. Although it is EPA's (United States Environmental Protection Agency) expectation that treatment or engineering controls will be used to address principal threat wastes and that groundwater will be returned to its beneficial use whenever practicable, ICs play an important role in site remedies because they reduce exposure to contamination by limiting land or resource use and guide human behavior at a site.

Government Publication Date: Jan 20, 2016

Emergency Response Notification System: ERNS 1982 TO 1986

Database of oil and hazardous substances spill reports controlled by the National Response Center. The primary function of the National Response Center is to serve as the sole national point of contact for reporting oil, chemical, radiological, biological, and etiological discharges into the environment anywhere in the United States and its territories.

Government Publication Date: 1982-1986

Emergency Response Notification System: ERNS 1987 TO 1989

Database of oil and hazardous substances spill reports controlled by the National Response Center. The primary function of the National Response Center is to serve as the sole national point of contact for reporting oil, chemical, radiological, biological, and etiological discharges into the environment anywhere in the United States and its territories.

Government Publication Date: 1987-1989

Emergency Response Notification System: ERNS

Database of oil and hazardous substances spill reports controlled by the National Response Center. The primary function of the National Response Center is to serve as the sole national point of contact for reporting oil, chemical, radiological, biological, and etiological discharges into the environment anywhere in the United States and its territories. This database is made available by the United States Environmental Protection Agency (EPA).

Government Publication Date: Sep 24, 2018

The Assessment, Cleanup and Redevelopment Exchange System (ACRES) Brownfield Database: FED BROWNFIELDS

Brownfields are real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. Cleaning up and reinvesting in these properties protects the environment, reduces blight, and takes development pressures off greenspaces and working lands. This database is made available by the United States Environmental Protection Agency (EPA).

Government Publication Date: Jan 11, 2019

FEMA Underground Storage Tank Listing: FEMA UST

The Federal Emergency Management Agency (FEMA) of the Department of Homeland Security maintains a list of FEMA owned underground storage tanks.

Government Publication Date: Dec 31, 2017

LIEN on Property: SEMS LIEN

The EPA Superfund Enterprise Management System (SEMS) provides LIEN information on properties under the EPA Superfund Program.

Government Publication Date: Nov 14, 2018

Superfund Decision Documents: SUPERFUND ROD

This database contains a listing of decision documents for Superfund sites. Decision documents serve to provide the reasoning for the choice of (or) changes to a Superfund Site cleanup plan. The decision documents include Records of Decision (ROD), ROD Amendments, Explanations of Significant Differences (ESD), along with other associated memos and files. This information is maintained and made available by the US EPA (Environmental Protection Agency).

Government Publication Date: Nov 14, 2018

State

Leaking Underground Storage Tanks: LUST

This is a list of Leaking Underground Storage Tanks maintained by the Hazardous Waste program of Guam's Environmental Protection Agency.

Government Publication Date: Jun 30, 2018

Underground Storage Tanks: UST

This is a list of Underground Storage Tanks maintained by the Hazardous Waste program of Guam's Environmental Protection Agency.

Government Publication Date: Jun 30, 2018

Tribal

No Tribal standard environmental record sources available for this State.

County

No County standard environmental record sources available for this State.

Additional Environmental Record Sources

Federal

Facility Registry Service/Facility Index: FINDS/FRS

The US Environmental Protection Agency (EPA)'s Facility Registry System (FRS) is a centrally managed database that identifies facilities, sites or places subject to environmental regulations or of environmental interest. FRS creates high-quality, accurate, and authoritative facility identification records through rigorous verification and management procedures that incorporate information from program national systems, state master facility records, data collected from EPA's Central Data Exchange registrations and data management personnel.

Government Publication Date: Oct 17, 2018

Toxics Release Inventory (TRI) Program: TRIS

The EPA's Toxics Release Inventory (TRI) is a database containing data on disposal or other releases of over 650 toxic chemicals from thousands of U.S. facilities and information about how facilities manage those chemicals through recycling, energy recovery, and treatment. One of TRI's primary purposes is to inform communities about toxic chemical releases to the environment.

Government Publication Date: Dec 31, 2017

Hazardous Materials Information Reporting System: HMIRS

US DOT - Department of Transportation Pipeline and Hazardous Materials Safety Administration (PHMSA) Incidents Reports Database taken from Hazmat Intelligence Portal, U.S. Department of Transportation.

Government Publication Date: May 23, 2018

National Clandestine Drug Labs: NCDL

The U.S. Department of Justice ("the Department") provides this data as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy.

Government Publication Date: Jul 18, 2018

Toxic Substances Control Act: TSCA

The Environmental Protection Agency (EPA) is amending the Toxic Substances Control Act (TSCA) section 8(a) Inventory Update Reporting (IUR) rule and changing its name to the Chemical Data Reporting (CDR) rule.
The CDR enables EPA to collect and publish information on the manufacturing, processing, and use of commercial chemical substances and mixtures (referred to hereafter as chemical substances) on the TSCA Chemical Substance Inventory (TSCA Inventory). This includes current information on chemical substance production volumes, manufacturing sites, and how the chemical substances are used. This information helps the Agency determine whether people or the environment are potentially exposed to reported chemical substances. EPA publishes submitted CDR data that is not Confidential Business Information (CBI).

Government Publication Date: Jun 30, 2017

Hist TSCA: HIST TSCA

The Environmental Protection Agency (EPA) is amending the Toxic Substances Control Act (TSCA) section 8(a) Inventory Update Reporting (IUR) rule and changing its name to the Chemical Data Reporting (CDR) rule.
The 2006 IUR data summary report includes information about chemicals manufactured or imported in quantities of 25,000 pounds or more at a single site during calendar year 2005. In addition to the basic manufacturing information collected in previous reporting cycles, the 2006 cycle is the first time EPA collected information to characterize exposure during manufacturing, processing and use of organic chemicals. The 2006 cycle also is the first time manufacturers of inorganic chemicals were required to report basic manufacturing information.

Government Publication Date: Dec 31, 2006

FTTS Administrative Case Listing: FTTS ADMIN

An administrative case listing from the Federal Insecticide, Fungicide, & Rodenticide Act (FIFRA) and Toxic Substances Control Act (TSCA), together known as FTTS. This database was obtained from the Environmental Protection Agency's (EPA) National Compliance Database (NCDB). The FTTS and NCDB was shut down in 2006.

Government Publication Date: Jan 19, 2007

FTTS Inspection Case Listing: FTTS INSP

An inspection case listing from the Federal Insecticide, Fungicide, & Rodenticide Act (FIFRA) and Toxic Substances Control Act (TSCA), together known as FTTS. This database was obtained from the Environmental Protection Agency's (EPA) National Compliance Database (NCDB). The FTTS and NCDB was shut down in 2006.

Government Publication Date: Jan 19, 2007

Potentially Responsible Parties List: PRP

Early in the cleanup process, the Environmental Protection Agency (EPA) conducts a search to find the potentially responsible parties (PRPs). EPA looks for evidence to determine liability by matching wastes found at the site with parties that may have contributed wastes to the site.

Government Publication Date: Dec 20, 2018

State Coalition for Remediation of Drycleaners Listing: SCRD DRYCLEANER

The State Coalition for Remediation of Drycleaners (SCRD) was established in 1998, with support from the U.S. Environmental Protection Agency (EPA) Office of Superfund Remediation and Technology Innovation. Coalition members are states with mandated programs and funding for drycleaner site remediation. Current members are Alabama, Connecticut, Florida, Illinois, Kansas, Minnesota, Missouri, North Carolina, Oregon, South Carolina, Tennessee, Texas, and Wisconsin.

Government Publication Date: Nov 08, 2017

Integrated Compliance Information System (ICIS): ICIS

The Integrated Compliance Information System (ICIS) is a system that provides information for the Federal Enforcement and Compliance (FE&C) and the National Pollutant Discharge Elimination System (NPDES) programs. The FE&C component supports the Environmental Protection Agency's (EPA) Civil Enforcement and Compliance program activities. These activities include Compliance Assistance, Compliance Monitoring and Enforcement. The NPDES program supports tracking of NPDES permits, limits, discharge monitoring data and other program reports.

Government Publication Date: Nov 18, 2016

Drycleaner Facilities: FED DRYCLEANERS

A list of drycleaner facilities from the Integrated Compliance Information System (ICIS). The Environmental Protection Agency (EPA) tracks facilities that possess NAIC and SIC codes that classify businesses as drycleaner establishments.

Government Publication Date: May 29, 2018

Delisted Drycleaner Facilities: DELISTED FED DRY

List of sites removed from the list of Drycleaner Facilities (sites in the EPA's Integrated Compliance Information System (ICIS) with NAIC or SIC codes identifying the business as a drycleaner establishment).

Government Publication Date: May 29, 2018

Formerly Used Defense Sites: FUDS

Formerly Used Defense Sites (FUDS) are properties that were formerly owned by, leased to, or otherwise possessed by and under the jurisdiction of the Secretary of Defense prior to October 1986, where the Department of Defense (DoD) is responsible for an environmental restoration. This list is published by the U.S. Army Corps of Engineers.

Government Publication Date: Oct 23, 2018

Material Licensing Tracking System (MLTS): MLTS

A list of sites that store radioactive material subject to the Nuclear Regulatory Commission (NRC) licensing requirements. This list is maintained by the NRC. As of September 2016, the NRC no longer releases location information for sites. Site locations were last received in July 2016.

Government Publication Date: Nov 1, 2018

Historic Material Licensing Tracking System (MLTS) sites: HIST MLTS

A historic list of sites that have inactive licenses and/or removed from the Material Licensing Tracking System (MLTS). In some cases, a site is removed from the MLTS when the state becomes an "Agreement State". An Agreement State is a State that has signed an agreement with the Nuclear Regulatory Commission (NRC) authorizing the State to regulate certain uses of radioactive materials within the State.

Government Publication Date: Jan 31, 2010

Mines Master Index File: MINES

The Master Index File (MIF) contains mine identification numbers issued by the Department of Labor Mine Safety and Health Administration (MSHA) for mines active or opened since 1971. Note that addresses may or may not correspond with the physical location of the mine itself.

Government Publication Date: Jan 30, 2018

Alternative Fueling Stations: ALT FUELS

List of alternative fueling stations made available by the US Department of Energy's Office of Energy Efficiency & Renewable Energy. Includes Biodiesel stations, Ethanol (E85) stations, Liquefied Petroleum Gas (Propane) stations, Ethanol (E85) stations, Natural Gas stations, Hydrogen stations, and Electric Vehicle Supply Equipment (EVSE). The National Renewable Energy Laboratory (NREL) obtains information about new stations from trade media, Clean Cities coordinators, a Submit New Station form on the Station Locator website, and through collaborating with infrastructure equipment and fuel providers, original equipment manufacturers (OEMs), and industry groups.

Government Publication Date: Jan 15, 2019

Registered Pesticide Establishments: SSTS

List of active EPA-registered foreign and domestic pesticide-producing and device-producing establishments based on data from the Section Seven Tracking System (SSTS). The Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Section 7 requires that facilities producing pesticides, active ingredients, or devices be registered. The list of establishments is made available by the EPA.

Government Publication Date: Mar 1, 2018

Polychlorinated Biphenyl (PCB) Notifiers: PCB

Facilities included in the national list of facilities that have notified the United States Environmental Protection Agency (EPA) of Polychlorinated Biphenyl (PCB) activities. Any company or person storing, transporting or disposing of PCBs or conducting PCB research and development must notify the EPA and receive an identification number.

Government Publication Date: Sep 14, 2018

State

No State additional environmental record sources available for this State.

Tribal

No Tribal additional environmental record sources available for this State.

County

No County additional environmental record sources available for this State.

Definitions

Database Descriptions: This section provides a detailed explanation for each database including: source, information available, time coverage, and acronyms used. They are listed in alphabetic order.

Detail Report: This is the section of the report which provides the most detail for each individual record. Records are summarized by location, starting with the project property followed by records in closest proximity.

Distance: The distance value is the distance between plotted points, not necessarily the distance between the sites' boundaries. All values are an approximation.

Direction: The direction value is the compass direction of the site in respect to the project property and/or center point of the report.

Elevation: The elevation value is taken from the location at which the records for the site address have been plotted. All values are an approximation. Source: Google Elevation API.

Executive Summary: This portion of the report is divided into 3 sections:

'Report Summary'- Displays a chart indicating how many records fall on the project property and, within the report search radii.

'Site Report Summary'-Project Property'- This section lists all the records which fall on the project property. For more details, see the 'Detail Report' section.

'Site Report Summary-Surrounding Properties'- This section summarizes all records on adjacent properties, listing them in order of proximity from the project property. For more details, see the 'Detail Report' section.

Map Key: The map key number is assigned according to closest proximity from the project property. Map Key numbers always start at #1. The project property will always have a map key of '1' if records are available. If there is a number in brackets beside the main number, this will indicate the number of records on that specific property. If there is no number in brackets, there is only one record for that property.

The symbol and colour used indicates 'elevation': the red inverted triangle will dictate 'ERIS Sites with Lower Elevation', the yellow triangle will dictate 'ERIS Sites with Higher Elevation' and the orange square will dictate 'ERIS Sites with Same Elevation.'

Unplottables: These are records that could not be mapped due to various reasons, including limited geographic information. These records may or may not be in your study area, and are included as reference.

APPENDIX B

Site Reconnaissance Photographs

Photograph 1. The subject property was accessible via University Avenue located on the eastern boundary of the property. The subject property is located to the right, road easement in the foreground, and University Avenue and the University of Guam (UOG) campus are in the background (15 March 2019).

Photograph 2. A view of Atbut Lane to east. The subject property is visible to the left and the adjoining property to the southeast is to the right. The UOG is visible in the background (14 March 2019)

Photograph 3. The adjoining property to the north was undeveloped and heavily vegetated (14 March 2019).

Photograph 4. One of the three apartment buildings located on the adjoining property to the south. This building was located along Atbut Lane to the south (15 March 2019).

Photograph 5. The second two-story apartment building located on the adjoining property to the south. This building was located at the end of Atbut Lane (14 March 2019).

Photograph 6. The third two-story apartment building located on the adjoining property to the south (15 March 2019).

Photograph 7. The adjoining property to the south also contained two single-family dwellings (14 March 2019).

Photograph 8. The UOG was located on the adjoining property to the east. A large landscaped area was visible across University Avenue. The subject property is to the right of this image (14 March 2019).

Photograph 9. The UOG campus was located across University Avenue, to the southeast of the subject property (15 March 2019).

Photograph 10. The entire subject property was densely vegetated with trees, brush, and vines (15 March 2019).

Photograph 11. Two large uprooted trees were observed in the center of the subject property (15 March 2019).

Photograph 12. A discarded refrigerator and trash were observed on the southwestern boundary of the subject property, near an apartment building on Atbut Lane (15 March 2019).

Photograph 13. Additional municipal trash observed on the southwestern boundary of the subject property, near an apartment building on Atbut Lane. No hazardous substances or petroleum products were observed in the dump area (15 March 2019).

Photograph 14. Three telephone junction boxes were observed on the eastern portion of the subject property, along University Avenue (09 May 2019).

Photograph 15. One of two abandoned vehicles observed on the southwestern boundary of the subject property. The vehicle was observed in poor condition and was overgrown with vines (15 March 2019).

Photograph 16. The second abandoned vehicle observed on the southwestern boundary of the subject property. The vehicle was observed in moderate condition (15 March 2019).

Photograph 17. One pole-mounted transformer was observed to the northeast of the subject property, along University Avenue. Black staining was visible on the exterior of the transformer (09 May 2019).

Photograph 18. One pole-mounted transformer was observed to the south of the subject property, along Atbut Lane and at an apartment building. Black staining was visible on the exterior of the transformer (09 May 2019).