

APPENDIX D

BEST MANAGEMENT PRACTICES

Chapter 4, *Environmental Consequences*, discusses how the proposed action incorporates resource management measures that avoid and/or minimize environmental impacts to resources. These resource management measures are incorporated into the design of the project in the form of avoidance and minimization measures, best management practices, and standard operating procedures. This appendix addresses best management practices and standard operating procedures, each of which is discussed below. Mitigation measures are provided in Chapter 4, *Environmental Consequences*.

1.0 BEST MANAGEMENT PRACTICES (MOST OFTEN ASSOCIATED WITH CONSTRUCTION ACTIVITIES)

Best management practices are existing policies, practices, and measures required by law, regulation, or Department of Defense policy that reduce the environmental impacts of the proposed action and are common practice in the industry. Best management practices are incorporated into the proposed action. They include standard military design, construction or operations practices or procedures, compliance with laws and typical regulatory permit requirements that the Department of Defense is committed to implementing. The Environmental Impact Statement (EIS)/Overseas Environmental Impact Statement (OEIS) impact analysis assumes the best management practices are successfully implemented when assigning a level of significant impact.

Examples:

- Clean Water Act, National Pollutant Discharge Elimination System (NPDES)
- Low Impact Development (LID)
- Dust Control Plan

2.0 STANDARD OPERATING PROCEDURES (MOST OFTEN ASSOCIATED WITH OPERATION ACTIVITIES)

The Department of Defense currently employs standard practices to provide for the safety of personnel and equipment, including vessels and aircraft, as well as the success of the training activities. In many cases there are incidental environmental, socioeconomic, and cultural benefits resulting from standard operating procedures. Standard operating procedures serve the primary purpose of providing for safety and mission success, and are implemented regardless of their secondary benefits. This is what distinguishes standard operating procedures, which are a component of the proposed action, from mitigation measures, which are designed entirely for the purpose of reducing environmental impacts resulting from the proposed action. Because standard operating procedures are crucial to safety and mission success, the Department of Defense would not modify them as a way to further reduce impacts on environmental resources. Rather, avoidance, minimization, and mitigation measures would be used as the tool for avoiding and reducing potential environmental impacts.

Examples:

- Munitions and Explosives of Concern (MEC)
- Range clearance
- Vessels look-outs

The best management practices and standard operating procedures relevant to this proposed action are listed in [Table D-1](#), which illustrates how minimization and avoidance measures often have a mitigating effect across multiple resource areas.

Table D-1. Best Management Practices

Best Management Practice/Standard Operating Procedure Topic	Description	Phase			Resource																
		Design	Construction	Operation	Geology & Soils	Water	Air Quality	Noise	Airspace	Land and Submerged Land Use	Recreation	Terrestrial Biology	Marine Biology	Cultural	Visual	Transportation (Air, Ground, Marine)	Utilities	Socioeconomics and Environmental Justice	Hazardous Materials	Public Health & Safety	
Seismic Design for Buildings	<p>UFC 3-310-04 Seismic Design for Buildings dated June 1, 2013 (Department of Defense 2013) are guidelines that would be implemented to reduce geologic hazards associated with seismicity, liquefaction, and ground shaking as follows:</p> <ul style="list-style-type: none"> Design earthquake-resistant buildings. Evaluate and rehabilitating existing buildings for earthquake resistance. Apply seismic design principles to specialized structural and non-structural elements. 	X	X		X																X
Dust Control Measures	<p>Implement a Dust Control Plan with the following measures when feasible:</p> <ul style="list-style-type: none"> Minimize land disturbance. Construct stabilized construction entrances per construction standard specifications. Cover trucks when hauling soil, stone, and debris. Use water trucks to minimize dust. Stabilize or cover stockpiles. Minimize dirt tracking by washing or cleaning trucks before leaving the construction site. 	X	X		X	X	X								X			X	X	X	X
Erosion Control Measures	<p>The erosion control measures would be implemented during construction and operations to eliminate and/or minimize nonpoint source pollution in surface waters due to sediment. CNMI DEQ established minimum standards and requirements necessary for controlling nonpoint source runoff from land disturbance. <i>CNMI Earthmoving and Erosion Control Regulations</i> (Volume 15, Number 10, October 15, 1993) and <i>CNMI Environmental Protection Act</i> (Public Law 3-23, 2 CMC §§ 2601 to 2605) establish a permit process for construction activities, identify investigations and studies that are required prior to design and construction, and provide standards for grading, filling, and clearing. The Erosion Control measures would include DEQ recommended BMPs that apply to federal actions in CNMI. The following is a list of some specific BMPs but is not intended to be an exhaustive list:</p> <p>Construction:</p> <ul style="list-style-type: none"> Minimize the ground disturbance area. Contractors would be held responsible for ground disturbance/vegetation removal that occurs outside of project areas identified in contractor specifications. Erosion control through site approval process (whereby the DoN reviews each proposed project for its erosion potential). The erosion control measures such as retention ponds, swales, silt fences, fiber rolls, gravel bag berms, mulch, and erosion control blankets would be implemented during construction and operations to eliminate and/or minimize nonpoint source pollution in surface waters due to sediment. Topsoil removed from the site would be placed in the immediate area and reused for re-compaction purposes (if appropriate, in accordance with geotechnical recommendations). Soil exposed near water as part of the project would be protected from erosion with erosion control blankets (organic or synthetic fibers held together with net to cover disturbed areas) after exposure, and stabilized as soon as practicable (with vegetation matting, hydroseeding, etc.). Flatten landfill slopes for increased soil stability. Silt-containment (silt fences and other physical barriers that intercept runoff from drainage areas). Re-vegetate as soon as possible after any ground disturbance or grading. Minimize construction and grading during times of inclement weather. 	X	X	X	X	X	X					X			X				X		

Table D-1. Best Management Practices

Best Management Practice/Standard Operating Procedure Topic	Description	Phase			Resource																
		Design	Construction	Operation	Geology & Soils	Water	Air Quality	Noise	Airspace	Land and Submerged Land Use	Recreation	Terrestrial Biology	Marine Biology	Cultural	Visual	Transportation (Air, Ground, Marine)	Utilities	Socioeconomics and Environmental Justice	Hazardous Materials	Public Health & Safety	
	<ul style="list-style-type: none"> Soil piles and exposed slopes covered during times of inclement weather. Stockpiling of excavated materials behind impermeable berms and away from the influence of surface waters and runoff. Implement a re-vegetation program to ensure graded benches are fully vegetated as landfills mature. Vegetation/mulch stabilization (applying coarse plant residue to cover soil surface. The vegetation/mulch should be free of invasive species viable reproductive parts, such as rhizomes, seeds, and plants). Level spreader (non-erosive outlet for runoff to disperse flow uniformly across slope). Rock outlet protection (rock protection placed at end of culverts). Sediment. <p>Operation:</p> <ul style="list-style-type: none"> Restrict vehicles in training areas (ensure that all training areas, including transit routes necessary to reach training areas, are clearly identified or marked. Restrict vehicular activities to designated/previously identified areas). 																				
Clean Water Act, National Pollutant Discharge Elimination System (NPDES) Program	<p>A Stormwater Management Plan (SWMP) and Stormwater Pollution Prevention Plan (SWPPP) would be prepared and implemented in compliance with the CNMI Stormwater Management Manual. A SWMP is a document that describes the minimal procedures and practices used to reduce the surface flow and subsequent discharge of pollutants to storm drainage systems. Elements of a SWMP include structural and non-structural practices such as:</p> <ul style="list-style-type: none"> Check dams (small temporary stone dam across drainage). Diversion dike/swale (berm or ditch that channels water to desired location). Lined waterway (lined outlet for drainage). Storm drain inlet protection (permeable barrier around inlets reducing sediment let into storm drain). Stormwater ponds and wetlands. Infiltration practices (capture/temporarily store water before infiltrating into the soil). Use of groundwater recharge wells and infiltration basins, where applicable. Filtering practices (capture/temporarily store water and pass through filter beds of sand, organic matter, soil, or other media). Soil stabilization (such as mulch and erosion control blankets). Perimeter and sediment control (such as silt fences, fiber rolls, gravel bag berms, and sediment traps). Management and covering of material, waste, and soil stockpiles when not in use. Storage of fuels and hazardous materials with proper secondary containment, and establishment of designated vehicle and equipment maintenance and fueling areas. Management of spills and leaks from vehicles and equipment through inspections and use of drip pans, absorbent pads, and spill kits. A contingency plan to control petroleum products accidentally spilled during the project would be developed. <p>U.S. military facilities are required to comply with the Program-level SWPPP for construction, in addition to individual project SWPPPs during construction and then during day-to-day operations, to ensure that stormwater remains free of contaminants. A SWPPP is a self-implementing plan for compliance with the NPDES Construction</p>	X	X	X	X	X						X				X			X		

Table D-1. Best Management Practices

Best Management Practice/Standard Operating Procedure Topic	Description	Phase			Resource																
		Design	Construction	Operation	Geology & Soils	Water	Air Quality	Noise	Airspace	Land and Submerged Land Use	Recreation	Terrestrial Biology	Marine Biology	Cultural	Visual	Transportation (Air, Ground, Marine)	Utilities	Socioeconomics and Environmental Justice	Hazardous Materials	Public Health & Safety	
	<p>General Permit and an installation's stormwater permit. It requires regular site inspections and development of pollution prevention measures, including BMPs, to reduce and control pollutants in stormwater discharge. Similar to the measures listed under the Erosion Control Plan, potential BMPs may include, but may not be limited to:</p> <ul style="list-style-type: none"> • Perimeter Dike/Swale • Sediment Basin • Sediment Trap • Silt Fence • Gravel/Sand Bag Berms • Stabilized Construction Entrance/Exit • Storm Drainage Inlet Protection • Straw Bale Dike <p>SWPPPs also require (1) routine inspections by qualified personnel during operations of areas where industrial materials are potentially exposed to stormwater, and (2) employee training regarding good housekeeping, spill response, and management practices.</p>																				
Technical Guidance on Implementing Stormwater Runoff Control Measures	Section 438 of the Energy Independence and Security Act, Technical Guidance on Implementing the Stormwater Runoff Requirements for Federal Projects establishes post-development stormwater management system that utilizes a combination of natural and engineered features that reduce the volume and rate of stormwater runoff (i.e., eliminate or minimize hydromodification), filter out pollutants, and facilitate groundwater recharge through infiltration-essentially. The preservation and reestablishment of vegetation after construction would minimize the potential for erosion and sediment runoff. See LID.	X	X	X	X	X							X				X		X		
Designate a Well Head Protection Zone	Avoid incompatible development and incompatible land use within well head protection zones during construction and operations.	X				X											X				X
Water Quality Monitoring Plan (WQMP)	Develop and implement a WQMP. WQMPs evaluate the effectiveness of environmental permits and/or performance standards. Monitoring plans identify ambient or control conditions at a particular site and capture deviations from those conditions resulting from a project or operations of a facility. WQMPs may range in complexity from visual inspections for sedimentation and protection measure failure to laboratory or field analysis of chemical and biological effects on water quality or organisms (acute/chronic bioassay), dependent on a given water resource.			X		X												X			
Properly closed existing groundwater wells	The DoD would properly close existing unused (production or monitoring) wells within the Military Lease Area to protect the groundwater resources.		X			X															

Table D-1. Best Management Practices

Best Management Practice/Standard Operating Procedure Topic	Description	Phase			Resource															
		Design	Construction	Operation	Geology & Soils	Water	Air Quality	Noise	Airspace	Land and Submerged Land Use	Recreation	Terrestrial Biology	Marine Biology	Cultural	Visual	Transportation (Air, Ground, Marine)	Utilities	Socioeconomics and Environmental Justice	Hazardous Materials	Public Health & Safety
Design individual projects using Leadership in Energy and Environmental Design (LEED) Certification Standards	<p>Current DoN/Marine Corps policy supports LEED. The policies support and facilitate Silver certification for bases. LEED is a voluntary point system tool that measures the degree of sustainability features incorporated into a development. Some LEED requirements include:</p> <ul style="list-style-type: none"> • Reduction of electrical energy use in buildings by 10% to save power. • Construction materials: use of local sources. DoN guidance and qualification for LEED Silver points requires that 50% non-hazardous waste and demolition debris are recycled. • Increased water efficiency. • Renewable energy. • The sustainability/LEED initiatives would help reduce potable water use and should have a positive effect on demand for wastewater treatment. 	X	X	X													X	X		
Design projects using Low Impact Development (LID) Standards	<p>LID measures would be consistent with guidelines provided in UFC 3-210-10 and stormwater management techniques provided in the CNMI Stormwater Management Manual. LID uses innovative methods to capture stormwater that would otherwise flow into nearby watersheds using a combination of retention devices and vegetation to allow stormwater to be retained and managed at the source, rather than relying on downstream efforts to control the flow of water and contaminants. Potential LID measures may include, but may not be limited to:</p> <ul style="list-style-type: none"> • Stormwater Ponds (Retention/Detention) • Stormwater Wetlands • Infiltration Practices • Filtering Practices • Open Channel Practices • Minimizing Exposure • Watershed-based Management. 	X	X	X		X						X					X			
Design Projects in Compliance with the Energy Policy Act of 2005 (EPACT)	<p>EPACT compliance includes analysis and life-cycle cost analysis using a simulated model and the following energy conservation measures:</p> <ul style="list-style-type: none"> • Buildings achieve an energy consumption level that is 30% below the level achieved by ASHRAE Standard 90.1. • Use low energy consuming products that are either "Energy Star"-qualified or Federal Energy Management Program-recommended. • Optimize building orientation to reduce cooling loads or energy loads to cool the buildings. • Optimize building insulation. • Seal building envelope for air tightness. • Incorporate "cool roof" building designs. • Use motion detectors to reduce lighting and to setback cooling in unoccupied buildings. • Maximize use of natural lighting. 	X		X													X			

Table D-1. Best Management Practices

Best Management Practice/Standard Operating Procedure Topic	Description	Phase			Resource															
		Design	Construction	Operation	Geology & Soils	Water	Air Quality	Noise	Airspace	Land and Submerged Land Use	Recreation	Terrestrial Biology	Marine Biology	Cultural	Visual	Transportation (Air, Ground, Marine)	Utilities	Socioeconomics and Environmental Justice	Hazardous Materials	Public Health & Safety
Design Projects with Water Conservation Measures	<p>Water Conservation Plans include as the use of:</p> <ul style="list-style-type: none"> • Low-flow faucets. • Ultra-low-consumption toilets/urinals with electric flush sensors. • Low-flow showerheads. • Lower flow commercial-type Energy Star washing machines in housing units. • Energy and water-saving dishwashers (Energy Star). • Water softeners only as needed. • Wastewater recycling in industrial washing and rinsing of aircraft and vehicles. • Water-efficient cooling systems. • Minimal landscape irrigation and no irrigation at housing. • Rainwater collection and reuse. <p>Meters installed at all facilities and key locations within the water distribution system that can significantly improve the ability to quickly identify leaks and take corrective action. In addition, educate the military population regarding practices that would conserve water (including full-load clothes washing).</p>	X		X													X	X		
Design Facilities and Implement Procedures to Minimize Hazardous Waste and Ensure Proper Management of Hazardous Substances	<p>Hazardous Materials Management Plans (HMMPs) describe implement procedures for the transportation, storage, use, and disposal of hazardous materials. Procedures would also include waste minimization plans that provide protocols designed to encourage and promote the efficient use of hazardous materials, substitute products that are less toxic whenever feasible, minimization of their use, and promote recycling and reuse of hazardous materials. HMMPs would contain procedures such as:</p> <ul style="list-style-type: none"> • Hazardous materials spill/release control (use of secondary containment and leak detection methods in operations involving liquid hazardous substances). • Construction materials and all construction-related materials should be free of leachable pollutants. • Train personnel (U.S. military personnel and contractors are trained in proper labeling, container, storage, staging, and transportation requirements for hazardous substances. Also, they are trained in accordance with spill prevention, control, and cleanup methods). • Perform all vehicle maintenance activities at U.S. military maintenance shops. • Ensure that all personnel and contractors store, handle, and dispose of all petroleum, oil, and lubricants per all applicable local and federal laws, regulations, and requirements. • As necessary, expand Defense Reutilization Marketing Offices on Guam for hazardous materials storage, transportation, and disposal capacity prior to any expected increases. • Contaminated topsoil removed from the site would be properly disposed of in an approved landfill in accordance with applicable regulatory requirements • Ensure that sediments to be dredged and soils to be excavated are well characterized, properly handled, and disposed of to minimize dispersal of any contaminants that may be present. • Temporary equipment laydown or construction staging areas would be located in previously disturbed (e.g., paved) areas when feasible. • Minimize the use of contaminated sites for new construction. When new construction occurs on sites where contamination and/or munitions and explosives of concern have been identified, ensure that the risk of human/ecological risk and exposure is minimized via the use of site-specific health and safety plans, engineering and administrative controls, and personal protective equipment. These site-specific 	X	X	X	X	X									X	X			X	X

Table D-1. Best Management Practices

Best Management Practice/Standard Operating Procedure Topic	Description	Phase			Resource															
		Design	Construction	Operation	Geology & Soils	Water	Air Quality	Noise	Airspace	Land and Submerged Land Use	Recreation	Terrestrial Biology	Marine Biology	Cultural	Visual	Transportation (Air, Ground, Marine)	Utilities	Socioeconomics and Environmental Justice	Hazardous Materials	Public Health & Safety
	<p>health and safety plans must specifically address how these controls would be implemented to ensure the protection of human health and the environment.</p> <ul style="list-style-type: none"> Minimize contamination of the marine environment from project-related activities through procedures such as: <ul style="list-style-type: none"> All construction project-related materials and equipment placed in the water would be free of pollutants. The project manager and heavy equipment operators would perform daily pre-work equipment inspections for cleanliness and leaks. All heavy equipment operations would be postponed or halted should a leak be detected, and would not proceed until the leak is repaired and equipment cleaned. This information is written into the construction contract conditions. Fueling of construction project-related vehicles and equipment would take place at least 50 feet away from the water, preferably over an impervious surface. With respect to construction equipment (dredging barges) that cannot be fueled out of the water, spill prevention booms would be employed to contain any potential spills. Any fuel spilled would be cleaned up immediately. A plan would be developed and implemented to prevent construction debris from entering or remaining in the marine environment during the project. 																			
Hazardous Waste Management Program (HWMP)	<p>HWMPs include waste minimization plans that provide protocols designed to encourage and promote the efficient use of hazardous materials, substitute products that are less toxic whenever feasible, minimize their use, and promote recycling and reuse of hazardous waste. HWMPs include the following recommendations:</p> <ul style="list-style-type: none"> Update and implement the existing HWMP to include procedures for the transportation, storage, use, handling, and disposal of hazardous waste. Also, modify project-specific hazardous waste disposal protocol as appropriate. Train personnel and contractor regarding project- and facility-specific hazardous waste plans. Contractors are required to have and to implement a contingency plan to control and contain toxic spills, including petroleum products. Appropriate materials to contain and clean potential spills would be maintained and readily available at the work site. Use spill/release control (use of secondary containment and leak detection methods in operations involving liquid hazardous substances). Use housekeeping protocol (improving overall hazardous waste housekeeping practices, keeping area swept, wiping up spills, etc.). Perform all maintenance activities at existing U.S. military maintenance shops. Ensure all DoD personnel and contractors are trained in accordance with the CNMI pesticide management regulations (May 3, 2013) regarding the importation, handling, use, and application of pesticides (e.g., during maintenance, pre and post construction, and general operations activities). Comply with federal, local, and U.S. military laws and regulations via inspections/audits/surveillances and implement corrective procedures as necessary. Also ensure that all personnel and contractors manage, store, handle, transport, and dispose of hazardous wastes in accordance with applicable local (CNMI Bureau of Environmental and Coastal Quality), U.S. Environmental Protection Agency, Resource Conservations and Recovery Act, and federal Hazardous and Solid Waste Amendments requirements. Ensure that contaminated topsoil removed from sites is properly disposed of in accordance with applicable regulatory requirements. 	X	X	X	X	X									X	X		X	X	

Table D-1. Best Management Practices

Best Management Practice/Standard Operating Procedure Topic	Description	Phase			Resource																
		Design	Construction	Operation	Geology & Soils	Water	Air Quality	Noise	Airspace	Land and Submerged Land Use	Recreation	Terrestrial Biology	Marine Biology	Cultural	Visual	Transportation (Air, Ground, Marine)	Utilities	Socioeconomics and Environmental Justice	Hazardous Materials	Public Health & Safety	
	<ul style="list-style-type: none"> Ensure that sediments to be dredged and soils to be excavated are well characterized, properly handled, and disposed of to minimize dispersal of any contaminants that may be present. Temporary equipment laydown or construction staging areas would be located in previously disturbed (e.g., paved) areas. Minimize the use of contaminated sites for new construction. When new construction occurs on sites where contamination and/or munitions and explosives of concern have been identified, ensure that the risk of human/ecological risk and exposure is minimized via the use of site-specific health and safety plans, engineering and administrative controls, and personal protective equipment in accordance with Code of Federal Regulations 29 1910.120 (hazardous waste operations and emergency response operations). These site-specific health and safety plans must specifically address how these controls would be implemented to ensure the protection of human health and the environment. In addition, as appropriate, conduct Phase I and II Environmental Site Assessments prior to construction activities and ensure that designs consider and address contaminated sites as appropriate. 																				
Spill Prevention, Control and Countermeasures (SPCC) and Facility Response Programs (FRP)	<ul style="list-style-type: none"> Update and implement existing SPCC Plan to assess and respond to hazardous substance spills and/or releases. Update and implement existing FRPs for responding to releases, leaks, or spills of hazardous substances. Ensure U.S. military personnel are trained as to proper labeling, container, storage, staging, and transportation requirements for hazardous substances. Also, ensure they are trained in accordance with spill prevention, control, and cleanup methods. Ensure POL/fuel transfers kept away from water bodies and a response/contingency plan is in place in the event of any releases, leaks, or spills. Ensure proper labeling of all hazardous substance containers to prevent inappropriate storage or use. Contaminant migration control (e.g., reducing contaminant migration pathways by preventing releases to drains, pipelines, and sewers and the use of absorbent pads and materials to prevent and control spills and releases). Ensure that contaminants (e.g., oils, greases, lubrication fluids for heavy equipment) are properly stored at work sites and temporary construction staging areas to avoid spills, releases, and leaks. Ensure that emergency response plans are in place for responding to releases, leaks, or spills of hazardous substances. Minimize the risk of uncontrolled leaks, spills, and releases through industry and DoN accepted methods for spill prevention, containment, control, and abatement. Minimize the risk of human exposure to contaminated media through the use of a site-specific health and safety plan, engineering and administrative controls, and appropriate personal protective equipment (e.g., indicating where eye-wash stations, fire extinguishers, etc., are located). 	X	X	X	X	X							X			X	X	X	X	X	

Table D-1. Best Management Practices

Best Management Practice/Standard Operating Procedure Topic	Description	Phase			Resource																
		Design	Construction	Operation	Geology & Soils	Water	Air Quality	Noise	Airspace	Land and Submerged Land Use	Recreation	Terrestrial Biology	Marine Biology	Cultural	Visual	Transportation (Air, Ground, Marine)	Utilities	Socioeconomics and Environmental Justice	Hazardous Materials	Public Health & Safety	
Munitions and Explosives of Concern (MEC) Protocol, Procedures, and Guidance	<ul style="list-style-type: none"> Comply with all applicable MEC protocol, procedures, and guidance including, but not limited to the NOSSA Instruction 8020.15B Explosives Safety Review, Oversight, and Verification of Munitions Responses prior to any construction/demolition or other site activities. Reduce the potential exposure to UXO through surveys or other means to identify and remedy this hazard prior to building upon a site. Work would be conducted by qualified UXO specialists. Implement routine firing range clearance operations (e.g., annually or as needed), perform sampling and analysis as deemed necessary, and implement all applicable U.S. military MEC operations guidance to minimize or eliminate potential MEC explosion hazards and other adverse impacts (including depositions with potential to leach into the subsurface). Implement land use controls, signage, periodic inspections, and other means to ensure no unauthorized access to firing ranges, MEC, and/or hazardous substances. Train construction crews on identifying and responding to MECs encountered in the field. UXO personnel would be available to monitor earthmoving activities. 	X	X	X	X	X														X	X
Radon Control Measures	Construction sites would be assessed for radon hazards. All occupied structures constructed or modified in areas determined to be at or above USEPA action levels for radon would be subject to radon resistant construction methods, installation of radon abatement systems, and periodic radon monitoring in accordance with OPNAVINST 5090.1D Chapter 25-3.2, as appropriate.	X	X	X			X													X	X
Biosecurity Outreach and Education	The DoD would implement a biosecurity education program to inform the general public, contractors and DoD civilian and military personnel about native versus non-native species, invasive species, and impacts of non-native invasive species on native species and ecosystems. Program materials may include educational brochures and posters that differentiate native and introduced species, define invasive species, describe the known impacts of invasive species on native species and ecosystems, and explain what can be done to prevent and control invasive species. Information would be provided on the biological resources in the project area, including special-status species, avoidance measures, and reporting requirements.		X	X							X	X			X		X				
DoN Landscaping Guidelines	<p>The DoN would develop a landscaping design manual and implement guidelines specific to appropriate plant selection and establishment for all DoN construction activities on Tinian and Pagan. This manual would implement required DoN policies including, but not limited to:</p> <ul style="list-style-type: none"> Use native plants for landscaping; Design, use, and promote construction practices that minimize adverse effects on natural habitat; Prevent pollution by reducing fertilizer and pesticide use, integrated pest management practices, recycling green waste (composting), and minimizing runoff; Implement efficient water practices; and Prevent the introduction of invasive species. 		X		X	X						X									
Contractor Plans and Specifications	All construction would occur within the limits of construction shown in the project figures. Contractors would be responsible for any unauthorized vegetation damage and would not move outside the designated construction zone.		X		X	X						X			X						
Contractor Education Program	The DoN has developed an education program to ensure construction contractor personnel are informed of the biological resources in the project area, including special-status species, avoidance measures, and reporting requirements.											X	X								

Table D-1. Best Management Practices

Best Management Practice/Standard Operating Procedure Topic	Description	Phase			Resource																	
		Design	Construction	Operation	Geology & Soils	Water	Air Quality	Noise	Airspace	Land and Submerged Land Use	Recreation	Terrestrial Biology	Marine Biology	Cultural	Visual	Transportation (Air, Ground, Marine)	Utilities	Socioeconomics and Environmental Justice	Hazardous Materials	Public Health & Safety		
Brown Treesnake Interdiction	<p>Joint Region Marianas has established a comprehensive brown treesnake interdiction program to ensure that military activities, including the transport of personnel and equipment from Guam, do not contribute to the spread of brown treesnake within the CNMI or other locations. Adherence to Commander U.S. Naval Forces Marianas (COMNAVMAR) Instruction 3500.4A, <i>Marianas Training Manual, Appendix A: Brown Treesnake Control and Interdiction Requirements</i>; COMNAVMAR Instruction 5090.10A, <i>Brown Tree Snake Control and Interdiction Plan</i>; 36 Wing Instruction 32-7004, <i>Brown Tree Snake Management</i>; and anticipated final Joint Region Marianas Instruction 5090.4, <i>Brown Treesnake Control and Interdiction</i>, which would replace COMNAVMAR Instruction 5090.10A and 36 Wing Instruction 32-7004, would minimize the likelihood brown treesnake introduction to Tinian and Pagan. In addition, for CJMT construction and training activities, the DoD would commit to implementing 100% inspection of all outgoing aircraft and all outgoing cargo transported via ship or aircraft from Guam to CNMI with trained quarantine officers and dog detection teams. Redundant 100% inspections would also be conducted on Guam within snake-free quarantine areas for all cargo transported from Guam to Tinian and when feasible on Pagan. The snake-free quarantine areas would be subject to (1) multiple day and night searches for snakes with appropriately trained interdiction canine teams, (2) snake trapping, and (3) human visual inspection for snakes. For all brown treesnake interdiction work, the skills and standards required to certify an inspection team as "qualified" would be agreed upon mutually by the DoD, U.S. Geological Survey Biological Resources Discipline, and U.S. Fish and Wildlife Service.</p> <p>The DoD would produce standard operating procedures for temporary brown treesnake barrier construction and use when permanent quarantine facilities are not available or are inadequate in size. Standard operating procedures would ensure that temporary barriers would be constructed and maintained in a manner that assures the efficacy of the barrier, and that staff maintaining and constructing the temporary barriers are trained and qualified prior to barrier construction and maintenance. Standard operating procedures would be developed in cooperation with the U.S. Geological Survey Biological Resources Discipline and the brown treesnake interdiction program to ensure that risk is adequately minimized. Barrier specifications and the qualifications of brown treesnake barrier maintenance and management staff would be mutually agreed upon by the DoD, U.S. Geological Survey Biological Resources Discipline, and U.S. Fish and Wildlife Service.</p> <p>The DoD would provide brown treesnake awareness briefings for all CJMT-associated military and contractor personnel prior to all CJMT construction and training activities. Brown treesnake awareness briefings would be scaled to the type of activity to take place. Awareness materials may consist of a brown treesnake educational video and distribution of brown treesnake information and personal inspection guidelines. Awareness briefs would emphasize that brown treesnake awareness must extend through the chain of command from the Commanding Officer to the individual military service member or from the contract project manager to the individual contractor.</p> <p>The DoD would also plan for and support implementation of rapid response procedures in the event of a brown treesnake sighting on Tinian or Pagan that is associated with military training. The DoD is aware of the limited availability of brown treesnake inspectors, trained dogs, and quarantine facilities and equipment on Guam and in the CNMI. Accordingly, the DoD would:</p> <ul style="list-style-type: none"> Coordinate closely with the U.S. Fish and Wildlife Service, brown treesnake interdiction program, brown treesnake rapid response program, and CNMI Department of Lands and Natural Resources staff on planning for training activities in the CNMI; Identify, along with these agencies, the inspection and interdiction requirements for CJMT activities, 	X	X	X									X									

Table D-1. Best Management Practices

Best Management Practice/Standard Operating Procedure Topic	Description	Phase			Resource																
		Design	Construction	Operation	Geology & Soils	Water	Air Quality	Noise	Airspace	Land and Submerged Land Use	Recreation	Terrestrial Biology	Marine Biology	Cultural	Visual	Transportation (Air, Ground, Marine)	Utilities	Socioeconomics and Environmental Justice	Hazardous Materials	Public Health & Safety	
	including the number of qualified quarantine officers and dog detection teams needed to ensure that inspection and interdiction requirements are met; and <ul style="list-style-type: none"> In cooperation with U.S. Fish and Wildlife Service, brown treesnake interdiction program, brown treesnake rapid response program, and CNMI DLNR staff, plan for and support implementation of brown treesnake rapid response procedures needed in the event of a brown treesnake sighting associated with military training. 																				
Pest Control Measures	In accordance with OPNAVINST 6250.4C, <i>Navy Pest Management Programs</i> (April 11, 2012); OPNAVINST 5090.1D, <i>Environmental Readiness Program</i> (January 10, 2014); and MCO P5090.1A Chapter 3, <i>Environmental Compliance and Protection Manual</i> (August 26, 2013), the DoD would develop and implement a comprehensive Integrated Pest Management Plan (IPMP). This IPMP would encompass all activities regarding the importation, handling, storage, use, and application of pesticides as well as address prevention of the introduction of potential invasive species to CNMI. U.S. military personnel and contractors would be trained in accordance with appropriate pesticide management regulations, regarding the importation, handling, use, and application of pesticides (e.g., during maintenance, pre and post construction activities, and general operations activities).	X	X	X							X								X	X	

Table D-1. Best Management Practices

Best Management Practice/Standard Operating Procedure Topic	Description	Phase			Resource																
		Design	Construction	Operation	Geology & Soils	Water	Air Quality	Noise	Airspace	Land and Submerged Land Use	Recreation	Terrestrial Biology	Marine Biology	Cultural	Visual	Transportation (Air, Ground, Marine)	Utilities	Socioeconomics and Environmental Justice	Hazardous Materials	Public Health & Safety	
Invasive Species Interdiction	<p>Executive Order 13112, <i>Invasive Species</i> (1999), directs federal agencies to prevent the spread of any invasive species in their work. To implement this directive for CJMT activities, the DoD would require that Hazard Analysis and Critical Control Point plans be developed and implemented to reduce or eliminate the spread of non-native invasive species. The DoD would require development and implementation of Hazard Analysis and Critical Control Point plans for all construction, transport, and logistics activities related to CJMT proposed actions. Required Hazard Analysis and Critical Control Point plans would include identification and implementation of control measures to prevent the inadvertent movement of non-native, invasive species to Tinian or Pagan. Construction, transport, and logistics personnel would be required to use appropriate facilities at their points of departure that comply with environmental laws and regulations to prevent the transport of invasive species, and to promptly take corrective actions for noncompliance. Preventive actions may include vehicle washdowns; inspections for soil, plant, insect, and other materials; and appropriate control measures that are implemented to prevent the movement of species.</p> <p>COMNAVMAR Instruction 3500.4A, <i>Marianas Training Manual</i> (2013), would be updated. The document currently calls for individual troops to conduct self-inspections to avoid potential introductions of non-native invasive species to the CNMI. Compliance with the biosecurity components of Instruction 3500.4A would be required for troops traveling to and from CJMT training sites, including inspection of all gear and clothing (e.g., boots, bags, weapons, pants) for soil accumulations, seeds, invertebrates, and vertebrates. The intent of this measure is to minimize the potential invasive species risks and subsequent effects associated with transport of troops and their gear to Tinian or Pagan.</p> <p>The DoD, in coordination with U.S. Fish and Wildlife Service and CNMI Division of Fish and Wildlife, would also develop a rapid response plan to ensure that the DoD and cooperating agencies can implement control measures and eliminate invasive species accidentally transported between islands. As with the potential transport of brown treesnake from Guam to Tinian or Pagan, the DoD would support implementation of rapid response efforts that may be required in the event of inadvertent DoD transport of insects such as the little fire ant (<i>Wasmannia auropunctata</i>), coconut rhinoceros beetle (<i>Oryctes rhinoceros</i>), or cycad scale (<i>Aulacaspis yasumatsui</i>) to Tinian.</p> <p>In addition, the DoD is a participating department in the development of the Regional Biosecurity Plan (previously referred to as the Regional Biosecurity Plan for Micronesia and Hawaii or Micronesia Biosecurity Plan), with the National Invasive Species Council, U.S. Department of Agriculture Animal and Plant Health Inspection Service, U.S. Geological Service Biological Resources Discipline, and the Smithsonian Environmental Research Center. The Regional Biosecurity Plan is intended to coordinate and integrate inter-agency non-native invasive species management efforts such as species control, interdiction, eradication, and research. When the Regional Biosecurity Plan is completed, the DoD would work cooperatively with U.S. Fish and Wildlife Service and the CNMI Division of Fish and Wildlife in the development and implementation of protocols for interdiction and control methods in accordance with recommendations in the plan that are determined to be applicable to CJMT activities. Invasive species interdiction measures would be implemented upon initiation of construction activities for CJMT.</p>	X	X	X								X	X	X							X

Table D-1. Best Management Practices

Best Management Practice/Standard Operating Procedure Topic	Description	Phase			Resource															
		Design	Construction	Operation	Geology & Soils	Water	Air Quality	Noise	Airspace	Land and Submerged Land Use	Recreation	Terrestrial Biology	Marine Biology	Cultural	Visual	Transportation (Air, Ground, Marine)	Utilities	Socioeconomics and Environmental Justice	Hazardous Materials	Public Health & Safety
Fire Prevention and Management	DoD would implement fire prevention and management specific to proposed CJMT activities. Fire prevention and management would include protocols for monitoring fire conditions and adjusting training as needed; establishing and managing fire breaks, establishing firefighting roads and water infrastructure; and educating training units. To minimize fire risk, vegetation within the High Hazard Impact Areas on Tinian and Pagan would be maintained to within 6 inches (15 centimeters) of the ground, and 98-foot (30-meter) wide firebreaks would be established along the perimeter of the High Hazard Impact Area on Tinian. Fire prevention and management would address the preventative and immediate actions required for fire hazards connected with Tinian and Pagan RTA training. Fire prevention and management activities would be implemented upon initiation of CJMT live-fire training.			X							X	X	X	X						X
Implement Bird/Animal Aircraft Strike Hazard Plan	In accordance with OPNAVINST 3750.6S, <i>Naval Aviation Safety Management System</i> , a Bird/Animal Aircraft Strike Hazard Plan would be implemented to address all aircraft operations on Tinian and Pagan. This plan is prepared to minimize the occurrence of bird/animal-aircraft strikes, and would provide detailed procedures to monitor and react to heightened risk of aircraft strikes of birds and other animals.			X								X			X					X
In-water Construction Best Management Practices	<p>The DoN would implement the following BMPs during in-water construction to minimize degradation of water quality and impacts to fish and marine resources:</p> <ul style="list-style-type: none"> All project-related materials and equipment (e.g., dredges) placed in the water should be clear of pollutants prior to use. No project-related materials (fill, revetment rock, etc.) should be stockpiled in the water (intertidal zones, reef flats, etc.). Construction contracts would include appropriate biosecurity measures. All debris removed from the marine/aquatic environment should be disposed at an approved upland or ocean-dumping site. A plan shall be developed to prevent debris and other wastes from entering or remaining in the marine environment during the project. No contamination (trash or debris disposal, non-native species introductions, etc.) of adjacent marine/aquatic environments (reef flats, channels, open ocean areas, stream channels, etc.) should result from project-related activities. Any under-layer fills used should be protected from erosion with stones (or concrete cover layer units) as soon after placement as practicable. Dredged material dewatering areas should be constructed and operated in accordance with all permit requirements. Provide advanced public notice of dredging activities to minimize conflicts with commercial shipping, recreational boating and other recreational activities. Suspend construction during inclement weather to prevent accidental release of dredged material and to ensure the integrity of silt curtains or other containment barriers, if utilized. Water quality monitoring and adjustments in construction activities in response to water quality results. Limit coastal natural shoreline work to low tides, if practicable. A construction perimeter could be set up to prevent recreational divers from being in the vicinity during pile driving activities. If sea turtles or marine mammals are noticed within 150 feet (46 meters) after in-water construction work has begun, that work may continue only if the activity would not affect the animal(s). For example, divers performing surveys or underwater work would likely be permissible, whereas operation of heavy equipment is likely not. 	X	X			X	X			X	X	X						X		

Table D-1. Best Management Practices

Best Management Practice/Standard Operating Procedure Topic	Description	Phase			Resource															
		Design	Construction	Operation	Geology & Soils	Water	Air Quality	Noise	Airspace	Land and Submerged Land Use	Recreation	Terrestrial Biology	Marine Biology	Cultural	Visual	Transportation (Air, Ground, Marine)	Utilities	Socioeconomics and Environmental Justice	Hazardous Materials	Public Health & Safety
	<ul style="list-style-type: none"> Personnel shall remain alert for marine mammals before and during pile driving. Pile driving would not commence if a marine mammal is observed within 300 feet (90 meters) or sea turtle is observed within 50 feet (15 meters) of operation. Pile driving can begin 30 minutes after the last sighting of the marine mammal or sea turtle. If pile driving is already started and a marine mammal or a sea turtle is sighted within 300 feet (90 meters) after drilling has commenced, drilling can continue unless the marine mammal or sea turtle comes within 210 feet (64 meters) during drilling; operations should then cease until the animal leaves the area of its own volition or after 30 minutes have passed since the last sighting. During pile driving and removal, the shutdown zone would be sized and established to avoid injury to marine mammals. Soft Start – The use of a soft-start procedure is believed to provide additional protection to marine mammals, sea turtles, and fish by providing a warning and/or giving marine species a chance to leave the area prior to the hammer operating at full capacity. Soft start shall be conducted at the beginning of each day's activity and at any time pile driving has ceased for more than 30 minutes. If vibratory pile driving has been occurring but impact has not for more than 30 minutes, soft start for the impact hammer must occur. The soft start requires contractors to initiate noise from vibratory hammers for 15 seconds at reduced energy followed by a 30-second waiting period. This procedure should be repeated two additional times. If an impact hammer is used, contractors are required to provide an initial set of three strikes from the impact hammer at 40% energy, followed by a 30-second waiting period, then two subsequent three-strike sets. All objects would be lowered to the bottom (or installed) in a controlled manner. This can include the use of buoyancy controls such as lift bags, or the use of cranes, winches, or other equipment that affect positive control over the rate of descent. If needed, in-water tethers, as well as mooring lines marker buoys shall be kept to the minimum lengths necessary, and shall remain deployed only as long as needed to properly accomplish the required task. Do not attempt to feed, touch, ride, or otherwise intentionally interact with any Endangered Species Act-listed marine species. A contingency plan to control toxic materials is required. Appropriate materials to contain and clean potential spills shall be stored at the work site (including aboard project-related vessels), and be readily available. All project-related materials and equipment placed in the water shall be free of pollutants. The project manager and heavy equipment operators shall perform daily pre-work equipment inspections for cleanliness and leaks. All heavy equipment operations shall be postponed or halted should a leak be detected, and shall not proceed until the leak is repaired and equipment cleaned. Fueling of land-based vehicles and equipment shall take place at least 50 feet (15 meters) away from the water, preferably over an impervious surface. Fueling of vessels shall be done at approved fueling facilities. A contingency plan to control petroleum products accidentally spilled during the project should be developed. Absorbent pads and containment booms should be stored on-site to facilitate the clean-up of accidental petroleum releases. 																			

Table D-1. Best Management Practices

Best Management Practice/Standard Operating Procedure Topic	Description	Phase			Resource															
		Design	Construction	Operation	Geology & Soils	Water	Air Quality	Noise	Airspace	Land and Submerged Land Use	Recreation	Terrestrial Biology	Marine Biology	Cultural	Visual	Transportation (Air, Ground, Marine)	Utilities	Socioeconomics and Environmental Justice	Hazardous Materials	Public Health & Safety
	<ul style="list-style-type: none"> Nobody (civilian, contractor, or DoD employee) shall perform fishing activities in the construction zone or from equipment or structures places for construction purposes. 																			
In-water Training Operations	<ul style="list-style-type: none"> All established harbor navigation rules are observed during amphibious operations occurring within an established harbor. During amphibious operations (landings and departures) occurring outside of an established harbor, Landing Craft Air Cushion vessels stay fully on-cushion or hover when over shallow reefs to avoid corals, hard bottom, and other substrate that could potentially damage equipment. Flagging or marking of particular coral heads at Green Beach to avoid during training operations. No contamination (trash or debris disposal, non-native species introductions, etc.) of adjacent marine/aquatic environments (reef flats, channels, open ocean areas, stream channels, etc.) should result from project-related activities. Amphibious vehicles and small boats would avoid approaching marine mammals and sea turtles head on, to the greatest extent practical given operational need and vessel safety (necessary steerage, sea state, navigational need). Operators shall be particularly vigilant to watch for turtles at or near the surface in areas of known or suspected turtle activity, and if practicable, reduce vessel speed. Marine mammals and sea turtles shall not be encircled or trapped between multiple vessels or between vessels and the shore. Do not attempt to feed, touch, ride, or otherwise intentionally interact with any ESA-listed marine species. A contingency plan to control petroleum products accidentally spilled during the project would be developed. 			X		X														
Implement Traffic Management Plan and Work Zone Traffic Management	<p>To minimize impacts of construction on vehicular travel, bicycle and pedestrian circulation, and/or access to destinations near the construction area, a construction management plan and appropriate traffic management strategies would be implemented. The traffic management plan may include the following elements:</p> <ul style="list-style-type: none"> A set of comprehensive traffic control measures, to be implemented during each construction phase and specific to each construction site, including scheduling of major truck trips and deliveries to avoid peak traffic hours; provision of detour signs if required; development of lane closure procedures, signs, and cones for drivers, bicycles, and pedestrians; and identification of designated construction access routes. Notification procedures for adjacent property owners (for each construction site) and public safety personnel regarding the timing of major deliveries, detours, and lane closures. A map depicting approved locations of construction staging areas for materials, equipment, and construction personnel vehicles. A process for tracking and responding to complaints regarding construction activity. Provision for accommodation of pedestrian and bicycle flow. Provision of parking management and spaces for all construction workers to ensure that construction workers do not park in on-street spaces. <p>In addition, the following BMPs for the maintenance of roadways and public rights-of-way may be imposed on the general contractor during the construction periods:</p> <ul style="list-style-type: none"> Any damage to the roadways caused by heavy equipment or resulting from project construction shall be repaired. All damage that is a threat to public health or safety shall be repaired immediately. The public 		X							X	X				X		X			X

Table D-1. Best Management Practices

Best Management Practice/Standard Operating Procedure Topic	Description	Phase			Resource															
		Design	Construction	Operation	Geology & Soils	Water	Air Quality	Noise	Airspace	Land and Submerged Land Use	Recreation	Terrestrial Biology	Marine Biology	Cultural	Visual	Transportation (Air, Ground, Marine)	Utilities	Socioeconomics and Environmental Justice	Hazardous Materials	Public Health & Safety
	<p>rights-of-way shall be restored to their preconstruction condition as established by a designated inspector and/or photo documentation.</p> <ul style="list-style-type: none"> Any heavy equipment brought to the construction site shall be transported by truck, where feasible. No materials or equipment shall be stored on the traveled roadway at any time. Portable toilet facilities and debris boxes shall be installed on the site before construction and shall be maintained properly through project completion. All equipment shall be equipped with mufflers. Before the end of each work day during construction, the general contractor or other subcontractors shall pick up and properly dispose of all litter resulting from, or related to the project, whether located on the property, within the public rights-of-way, or properties of adjacent or nearby neighbors. 																			
Diesel Emissions Control on Off-road Equipment	<ul style="list-style-type: none"> Comply with USEPA's Tier 2 engine emission standards Use ultra-low sulfur diesel fuel Minimize truck idling time 			X			X													
Noise Abatement	<p>BMPs to abate noise from construction include the following:</p> <ul style="list-style-type: none"> Ensure that all equipment items have the manufacturers' recommended noise abatement measures, such as mufflers, engine enclosures, and engine vibration isolators, intact and operational. Inspect all construction equipment at periodic intervals to ensure proper maintenance and presence of noise control devices (e.g., mufflers and shrouding). Turn off idling equipment. Implement a construction noise monitoring program to limit the impacts. Plan noisier operations during times least sensitive to receptors. Avoid scheduling construction during nighttime hours (10:00 p.m. to 7:00 a.m.) and on weekends. Keep noise levels relatively uniform and avoid impulsive noises. Maintain good public relations with the community to minimize objections to the unavoidable construction impacts. Provide frequent activity updates of all construction activities. <p>BMPs to abate operational noise impacts include the following:</p> <ul style="list-style-type: none"> Shifting some large-caliber operations from the southernmost firing points to points farther away from Tinian receptors. On Tinian, limiting normal aircraft departure and arrival procedures to areas over the Military Lease Area to the north of the runway. On occasion, infrequent exceptions may occur and flights may be directed to south of the runway. Assuring that aircraft operations to the south would occur only in case of a missed approach or during the rare westerly winds when take-offs and landings are oriented to the west. 	X	X				X		X								X		X	
Observation Towers and Surface Radar	Trained observers would scan the SDZ and monitor surface radar prior to and during live-fire training to ensure that there are no vessels within or approaching the SDZ. If vessels are at risk from operation of the range, use of the range would be suspended until the vessel clears the SDZ area.			X						X					X					X

Table D-1. Best Management Practices

Best Management Practice/Standard Operating Procedure Topic	Description	Phase			Resource															
		Design	Construction	Operation	Geology & Soils	Water	Air Quality	Noise	Airspace	Land and Submerged Land Use	Recreation	Terrestrial Biology	Marine Biology	Cultural	Visual	Transportation (Air, Ground, Marine)	Utilities	Socioeconomics and Environmental Justice	Hazardous Materials	Public Health & Safety
Notice to Mariners	Range Control would coordinate with the U.S. Coast Guard to announce in the Notice to Mariners the proposed schedule for the use of the Tinian and Pagan RTAs to inform vessel operators of periods of potential sea space use.			X							X					X		X		X
Notice to Air Traffic	Range Control would coordinate with the Federal Aviation Administration to announce in the Notice to Airmen the proposed schedule for the use of the SDZ to inform vessel operators of periods of potential airspace use.			X					X							X		X		X
Utility Services	For roadway projects, planning and continued coordination with utility providers during the preliminary engineering and final design, and construction stages of the project should minimize or eliminate interruption in utility service to customers.	X	X														X	X		
Energy and Water Conservation/ Energy Policy Act	Implement Energy and Water Conservation/Energy Policy Act 2005, Executive Order 13221 (2001) to reduce energy and water consumption through conservation, efficiency, use of Energy Star appliances, building orientation and insulation to reduce energy use, setback thermostats, cool roof technology, solar energy, efficient and/or natural lighting, among others.	X		X													X			
Solid Waste Recycling/Executive Order 13514	Recycle material from municipal solid waste, such as glass, paper, metals, etc.			X													X			
Green Waste and Construction and Demolition Debris Diversion	Executive Order 13514, <i>Federal Leadership in Environmental, Energy, and Economic Performance</i> (2009), would be implemented to address construction debris management. During construction and operations, all green waste would be processed for reuse on island (e.g., mulch and compost). Diversion of construction and demolition debris for reuse at a minimum of 50% (including such actions as concrete crushing and reuse as base material and grinding and reuse of asphaltic concrete from roads).		X	X								X					X			
Cultural Resources	Secretary of the Interior's Standards for Rehabilitation would be implemented for the maintenance and repair of historic runways at the North Field National Historic Landmark. For post-review discoveries, an assessment would be made for National Register of Historic Places eligibility in consultation with the State Historic Preservation Officer. For areas or properties that have not been inventoried for historic properties, DoD would follow Standard Operating Procedures as outlined in the Section 106 consultation agreement.		X										X					X		

Table D-1. Best Management Practices

Best Management Practice/Standard Operating Procedure Topic	Description	Phase			Resource															
		Design	Construction	Operation	Geology & Soils	Water	Air Quality	Noise	Airspace	Land and Submerged Land Use	Recreation	Terrestrial Biology	Marine Biology	Cultural	Visual	Transportation (Air, Ground, Marine)	Utilities	Socioeconomics and Environmental Justice	Hazardous Materials	Public Health & Safety
Implement Range Training Area Management Plan	<p>Manage live-fire ranges in accordance with MCO P3550.10, <i>Policies and Procedures for Range and Training Area [RTA] Management</i> (2005). Update the existing training area management plans to include the new ranges. There are many management practices addressed in the plan and mentioned above, which include the following:</p> <ul style="list-style-type: none"> • Remove expended rounds from the ranges periodically and transporting them to an appropriate recycling contractor or smelter in accordance with appropriate regulations. • Develop and implement a Range Safety Program to conduct or coordinate training area safety, emergency response (medical and fire), Explosive Ordnance Disposal, Training Mishap Investigations, safety training, and range inspections. • Develop and implement a Range Fire Management Plan, based on DoN Wildlife Fire Management plan to reduce risk of fire originating from the range. Includes protocols for monitoring fire conditions and adjusting training as needed, establishing/managing fire breaks, fire-fighting roads and water infrastructure, and education of training units. • Adhere to protective measures established in natural and cultural resource management plans. • Controls for training area airspace in accordance with Federal Aviation Administration regulations and agreements, with an objective of use by multiple agencies with minimal interference and maximum safety. • Manage of movement and access into and within the training area by monitoring and controlling use of surface roads, shorelines and adjacent water areas, and airspace above the Range Training Area. • Publication of advanced notice for periods of range use to airman, mariners, and the general public as required for safe training area operations. • Comply with water protection measures and Military Handbook 1027/3B procedures to minimize the potential for groundwater leachate to reach the groundwater table affect groundwater production (supply) wells (i.e., soil amendments to maintain soil pH between 6 and 8; maintaining vegetation on berms and drainage ways and turf on the range; contaminant monitoring; and reclamation and recycling of spent ammunition. • Implement a monitoring program to identify any early indications of lead movement so that action could be taken to address any potential water quality impacts. • Implement the Operational Risk Management process as outlined in as outlined in OPNAVINST 3500.39A and MCO 3500.27B. Management measures would include: <ul style="list-style-type: none"> o Develop and clearly mark SDZs, which determine the restricted land and airspace requirements to laterally and vertically contain projectiles, fragments, debris, and components resulting from weapons firing. o Prior to conducting training activities, clear public and non-participating personnel from the training area. o Continually assess Range Training Area operations and update/revise safety measures as needed. 			X	X	X				X		X	X			X			X	X

Table D-1. Best Management Practices

Best Management Practice/Standard Operating Procedure Topic	Description	Phase			Resource																
		Design	Construction	Operation	Geology & Soils	Water	Air Quality	Noise	Airspace	Land and Submerged Land Use	Recreation	Terrestrial Biology	Marine Biology	Cultural	Visual	Transportation (Air, Ground, Marine)	Utilities	Socioeconomics and Environmental Justice	Hazardous Materials	Public Health & Safety	
Range Environmental Vulnerability Assessments (REVA)	<p>The Marine Corps would utilize the REVA program, in compliance with DoDI 4715.14 (2005), to assess the potential impacts to human health and the environment from live-fire training operations. The purpose of the REVA is to identify whether there is a release or a substantial threat of a release of munitions constituents from the operational range or range complex areas to off-range areas and determine if the release causes an unacceptable risk to human health and/or the environment. The Marine Corps would collect baseline data to support the assessment as part of a baseline survey conducted before the ranges are approved for use. The REVA program would conduct an assessment on all live-fire operational ranges after they have been in use for a minimum of a year. Conservative fate and transport models of the REVA-indicator munitions constituents; trinitrotoluene, cyclotetramethylene tetranitramine, and hexahydro-trinitro-triazine, and perchlorate, would be used, when appropriate, to determine if munitions constituents are migrating off-range.</p> <p>Lead is the primary REVA-indicator munitions constituents for small arms ranges; however, in order to conduct fate and transport parameters, site-specific geochemical properties are needed. Therefore, small arms ranges associated with the installation would be qualitatively reviewed and assessed to identify factors that influence the potential for lead migration at the operational range, including:</p> <ul style="list-style-type: none"> • Design and layout. • The physical and chemical characteristics of the area. • Current and past operation and maintenance practices. <p>In addition, potential receptors and pathways must be identified relative to the small arms range being assessed. Prior to the construction of the range, a site inspection would be completed by the installation to provide information on the design including the specific grading, and soil amendments that are required, where needed. Range management plans identify procedures for safe range usage and risk reduction. The vulnerability assessment identifies releases or substantial threats of a release of munitions constituents from range complex areas to off-range areas. Accomplished through a baseline assessment of operational range areas and, where applicable, the use of fate and transport modeling of the munitions constituents.</p> <p>Potential Range Management BMPs would be incorporated into the design and construction of the range to minimize the off-site migration of surface water and munitions constituents. These Potential Range Management BMPs may include, but may not be limited to:</p> <ul style="list-style-type: none"> • Maintain grassy vegetation on berms. • Manage stormwater at ranges through LID measures. • Restrict vehicular activities at ranges to designated/previously identified areas. • Conduct range clearance (remove expended rounds) of live-fire ranges with impact berms approximately every 5 years (depending on tabulated use). • Adding soil amendments to maintain the soil pH between 6 and 8. • The REVA program would evaluate these preventative measures at a minimum every 5 years to ensure their effectiveness. 	X	X	X	X	X													X	X	X

Table D-1. Best Management Practices

Best Management Practice/Standard Operating Procedure Topic	Description	Phase			Resource															
		Design	Construction	Operation	Geology & Soils	Water	Air Quality	Noise	Airspace	Land and Submerged Land Use	Recreation	Terrestrial Biology	Marine Biology	Cultural	Visual	Transportation (Air, Ground, Marine)	Utilities	Socioeconomics and Environmental Justice	Hazardous Materials	Public Health & Safety
Restrict Access to Electromagnetic Emitters	Restrict access to emitters through the use of security fencing, posting warning signs, or locking out unauthorized persons in areas, where practical. Operate electromagnetic emission sources in accordance with applicable safety standards.	X		X																X
Naval Ordnance Safety and Security Activity (NOSSA) Instruction 8020.15D	At munitions response sites, no site operations may begin unless NOSSA and the U.S. military Explosive Safety Board have reviewed and approved the Explosives Safety Submission. Comply with the approved Explosives Safety Submission for on-site construction support where the likelihood of encountering UXO is determined to be moderate or high and where ground-disturbing activities may occur in areas known or suspected to contain UXO.	X	X	X															X	X
Hazards to Electromagnetic Radiation to Ordnance	A Hazards to Electromagnetic Radiation to Ordnance safety program and instruction (detailed directions pertaining to types of munitions authorized for use, based on specific transmitters/antennas in use) would provide emission control procedures for safely minimizing operational restrictions due to Hazards to Electromagnetic Radiation to Ordnance. This includes safe separation distances for all personnel (military and non-military), ground vehicles, ships, and aircraft.																			X
Occupational Safety and Health Administration	Implement a construction health and safety program that complies with federal and local health and safety regulations. Elements of the safety program would include: <ul style="list-style-type: none"> Responsibilities of construction workers and subcontractors Job site rules and regulations Emergency response procedures Safety inspections and audits Location of medical services and first aid Safety meetings, employee training, and hazard communications Personal protective equipment Standard construction procedures Accident investigation and reporting Implement all noise reduction and hearing protection requirements and regulations. 	X	X	X				X											X	X
Federal Aviation Administration Coordination	<ul style="list-style-type: none"> Contractor coordination with the Commonwealth Port Authority and the various air and sea carriers in advance for transport arrangement during peak season when the majority of construction personnel and dependents may travel at the same time (i.e. during Christmas Exodus break), to possibly spread out the departure/arrival times and to utilize different modes of transport to mitigate temporary strain on air transportation infrastructure. Adjustment of construction timing and phasing to accommodate the civil and commercial usage of the existing airport facilities. 								X	X					X					X
Hazard Communication and Evacuation Plan	A Hazard Communication and Evacuation Plan would address safety of military and construction personnel by providing communication and evacuation procedures for use during emergency situations such as tsunami inundation, volcanic activity, or seismic activity.		X	X	X															X
Standard Flight Operations	Implement approach and departure patterns to minimize noise over populated area.			X				X												

Legend: ASHRAE = American Society of Heating, Refrigerating, and Air-Conditioning Engineers; BMP = Best Management Practice; CJMT = Commonwealth of the Northern Mariana Islands Joint Military Training; CNMI = Commonwealth of the Northern Mariana Islands; COMNAVMAR = Commander U.S. Naval Forces Marianas; dB = decibels; DEQ = Department of Environmental Quality; DoD = Department of Defense; DoDI = Department of Defense Instruction; DoN = Department of the Navy; EPACT = Energy Policy Act; Endangered Species Act = ESA; FRP = Facility Response Plan; HMMP = Hazardous Materials Management Plan; HWMP = Hazardous Waste Management Plan; IPMP = Integrated Pest Management Plan; LEED = Leadership in Energy and Environmental Design; LID = Low Impact Development; MCO = Marine Corps Order; MEC = Munitions and Explosives Constituents; NOSSA = Naval Ordnance Safety and Security Activity; NPDES = National Pollutant Discharge Elimination System; OPNAVINST = Office of the Chief of Naval Operations Instruction; POL = petroleum, oil, and lubricants; REVA = Range Environmental Vulnerability Assessment; RTA = Range and Training Area; SDZ = Surface Danger Zone; SPCC = Spill Prevention, Control, and Countermeasure; SWMP = Stormwater Management Plan; SWPPP = Stormwater Pollution Prevention Plan; UFC = United Facilities Criteria; USEPA = U.S. Environmental Protection Agency; UXO = unexploded ordnance; WQMP = Water Quality Monitoring Plan.