CHAPTER 18. HAZARDOUS MATERIALS AND WASTE

18.1 INTRODUCTION

This chapter discusses the potential environmental consequences associated with implementation of the alternatives within the region of influence (ROI) for this resource. For a description of the affected environment for all resources, including current hazardous substance handling, storage, transportation, and management plans; techniques; approaches; and potential mitigation measures, refer to the respective chapter of Volume 2 (Marine Corps Relocation – Guam). The locations described in that volume include the ROI for the utilities projects. The chapters are presented in the same order as the resource areas discussed in this volume.

18.2 ENVIRONMENTAL CONSEQUENCES

18.2.1 Approach to Analysis

18.2.1.1 Methodology

Utilities

Potential environmental consequences and mitigation measures related to the expansion of the utilities infrastructure on Guam were evaluated regarding the following:

- Utilities infrastructure construction impacts
- Utilities operational impacts

These potential impacts were assessed for the general public as well as various media (i.e., soils, surface water, groundwater, air, and biota).

Roadway Projects

Hazardous substances are controlled in the United States primarily by laws and regulations administered by U.S. Environmental Protection Agency (USEPA), the U.S. Occupational Safety and Health Administration (OSHA), and the U.S. Department of Transportation (DOT). Each agency incorporates hazardous substance controls and safeguards according to its unique Congressional mandate. USEPA regulations focus on the protection of human health and the environment. OSHA regulations primarily protect employee and workplace health and safety. DOT regulations promote the safe transportation of hazardous substances used in commerce. In addition, the U.S. Territory of Guam oversees and administers its environmental laws and regulations through Guam Environmental Protection Agency (GEPA). All public and private entities located on Guam are subject to the GEPA environmental requirements. The GEPA Hazardous Waste Management Program and statutory authority is based primarily upon Title 10 Guam Code Annotated.

This contamination screening was prepared pursuant to the Federal Highway Administration (FHWA) Technical Advisory T 6640.8, dated October 30, 1987 (FHWA 1987). This advisory provides guidance on the evaluation of hazardous waste sites that would have an effect on the proposed roadway improvements. This advisory recommends that hazardous waste sites be identified and mapped in relation to the location of project alternatives under consideration.

The potential presence of polychlorinated bipenhyls (PCBs) would also be a concern because of the

presence of pole-mounted transformers on electrical transmission poles throughout the island.

A contamination screening of the roadway projects within the study area was conducted to determine the potential for contamination of the corridor right-of-way (ROW) and intersection improvements from adjacent properties and business operations. The screening included a review of an environmental database search, document and file reviews, a review of previous studies, a review of aerial photography, a review of company websites, and field visits. The impacts to the proposed roadway alternatives, and evaluation of hazardous material and hazardous waste generation associated with the roadway construction, are discussed in the Environmental Consequences section for Roadway Projects.

Environmental Database Review

An environmental database search was performed by Environmental Data Resources, Inc. (EDR). The resulting EDR ZIP/Plus reports identified potential hazardous materials and petroleum contamination sites that are listed in USEPA databases (EDR 2009). This database search utilized a geographic information system -integrated database that included federal- and state-regulated sites.

The EDR ZIP/Plus reports provided information on potential contamination sites within the study area by zip codes. Maps to locate the sites were not available. Locally known sites previously documented in the land use review or known military facilities that were identified by the EDR ZIP/Plus reports were located and field verified. The remaining EDR information was cross referenced with additional potential contamination sites identified in the field to include available regulatory information in the site descriptions. After field verification, potential contamination sites were eliminated from further consideration if they were not within 0.25-mile (0.40-kilometers [km]) of the centerline of the proposed roadway or intersection improvement.

The agency list descriptions define the regulatory databases reviewed for this report, along with the dates that each database was last updated by the respective agency and EDR. The following USEPA databases provided support documentation for the evaluation process:

- National Priorities List (NPL), January 26, 2009 – The NPL was devised to prioritize sites for the purpose of taking remedial action as funded by the Hazardous Waste Substance Superfund program, (initially established under the Comprehensive Environmental Response, Compensation and Liability Act of 1980 [CERCLA]).
- Proposed NPL, January 26, 2009 – Proposed NPL Sites.
- National Priority List Deletions (DELISTED NPL), January 26, 2009 – A listing of sites that have been deleted from the NPL. The National Oil and Hazardous Substance Pollution Contingency Plan established the criteria that USEPA uses to delete sites from the NPL.
- NPL Liens, February 16, 2009 – Federal Superfund Liens.
- Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS), January 30, 2009 – This list contains facilities or locations that USEPA is investigating to determine if an existing or threatened release of hazardous substance is present.
- CERCLIS-No Further Remedial Action Planned (NFRAP) List, January 26, 2009 – As of February 15, 1995, CERCLIS no longer includes sites that USEPA has assessed and designated as an NFRAP site. An NFRAP designation means that, to the best of USEPA's knowledge, USEPA (or its agent) has completed assessment activities at the site and has determined that no further steps to list this site on the NPL would be taken unless information indicating this decision was not appropriate or other considerations make a recommendation for listing appropriate at a later time.
- Liens 2, March 3, 2009 – CERCLA Lien Information.

- Resource Conservation and Recovery Act Information System National Oversite Database Handlers With Corrective Action Activity (CORRACTS), March 3, 2009 – This database is a listing of hazardous waste handlers that have undergone RCRA corrective action activity.
- Resource Conservation and Recovery Act Information System, February 20, 2009 – This list identifies those facilities or locations that have notified USEPA of their activities relative to the handling of hazardous wastes. It includes facilities that generate, transport, store, treat and/or dispose of hazardous waste as defined by the RCRA. Transporters are individuals or entities that move hazardous waste from the generator off site to a facility that can recycle, treat, store, or dispose of the waste. Large quantity generators generate more than 1,000 kilograms (kg) of hazardous waste, or more than 1-kg of acutely hazardous waste per month. Small quantity generators generate between 100 kg and 1,000 kg of hazardous waste per month. Conditionally exempt small quantity generators generate less than 100 kg of hazardous waste, or less than 1-kg of acutely hazardous waste per month.
- Engineering Controls Sites List, December 29, 2008 – A listing of sites with engineering controls in place.
- Sites with Institutional Controls, December 29, 2008 – A listing of sites with institutional controls in place.
- Emergency Response Notification System, January 30, 2009 - This database is used to store information on the notification of oil discharges and hazardous substance releases. This report is a compilation of data from 1987 to present.
- Hazardous Materials Information Reporting System, January 30, 2009 – This system contains hazardous material spill incidents reported to DOT.
- DOT, Office of Pipeline Safety Incident and Accident Data, February 24, 2009 – DOT incident and accident data.
- Clandestine Drug Labs, October 31, 2008 – A listing of clandestine drug lab locations. Provided by the U.S. Department of Justice, this listing contains addresses of some locations where law enforcement agencies reported chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites.
- U.S. Brownfields, February 10, 2009 – A listing of Brownfields sites.
- Formerly Used Defense Sites (FUDS), December 29, 2008 – Includes locations of FUDS where the U.S. Army Corps of Engineers is actively working or would take necessary cleanup actions.
- Land Use Control Information Systems, March 9, 2009 – Contains records of land use control information pertaining to the former Navy Base Realignment and Closure properties.
- Superfund Consent Decrees, January 19, 2009 – Major legal settlements that establish responsibility and standards for cleanup at NPL (Superfund) sites.
- Record of Decision, December 29, 2009 – Record of Decision documents mandate a permanent remedy at an NPL (Superfund) site containing technical and health information to aid in the cleanup.
- Toxic Release Inventory System List, September 19, 2008 – The Toxic Release Inventory System List identifies facilities that are required to submit annual reports relative to the estimated release of toxic chemicals to the environment.
- Toxic Substance Control Act (TSCA), February 18, 2009 – TSCA identifies manufacturers and importers of chemical substance included on the TSCA Chemical Substance Inventory list.
- Federal Insecticide, Fungicide, & Rodenticide Act (FIFRA)/TSCA (FTTS), December 2007 and December 2008 Files – FTTS tracks administrative cases and pesticide enforcement actions and compliance activities related to an Emergency Planning and Community Right-to-Know Act.

- Biennial Reporting System, February 19, 2009 – The Biennial Reporting System is a national system administered by USEPA that collects data on the generation and management of hazardous waste.
- Facility Index System, December 29, 2008 – The Facility Index System is a historical database that identifies facilities and/or locations that are subject to regulation under certain USEPA programs, due to operations conducted at these sites.
- Section Seven Tracking System, December 12, 2008 – Section 7 of the FIFRA, as amended, requires all registered pesticide-producing establishments to submit a report to USEPA by March 1 each year. Each establishment must report the types and amounts of pesticides, active ingredients, and devices being produced and those having been produced and sold or distributed in the past year.
- Integrated Compliance Information System, January 12, 2009 – This system supports the information of the national enforcement and compliance program, as well as the unique needs of the National Pollutant Discharge Elimination System.
- PCB Activity Database System, January 2, 2009 – This system identifies generators, transporters, commercial storers, and/or brokers and disposers of PCBs who are required to notify USEPA of such activities.
- Material Licensing Tracking System, December 29, 2008 – This system is maintained by the Nuclear Regulatory Commission and contains a list of approximately 8,100 sites that possess or use radioactive materials and that are subject to Nuclear Regulatory Commission licensing requirements.
- RADINFO: Radiation Information Database, January 30, 2009 – This database contains information about facilities that are regulated by USEPA regulations for radiation and radioactivity.
- RCRA Administrative Action Tracking System, June 2, 2008 – This system contains records based on enforcement actions issued under RCRA pertaining to major violators and includes administrative and civil actions brought by USEPA. For administration actions after September 30, 1995, data entry in the database was discontinued.
- Risk Management Plans, February 16, 2009 – When Congress passed the Clean Air Act Amendments of 1990, it required USEPA to publish regulations and guidance for chemical accident prevention at facilities using extremely hazardous substances. The Risk Management Program Rule was written to implement Section 112(r) of these amendments. The rule is built upon existing industry codes and standards, and it requires companies of all sizes that use certain flammable and toxic substances to develop a Risk Management Program that includes a hazard assessment that details the potential effects of an accidental release, an accident history of the last 5 years, and an evaluation of worst-case and alternative accidental releases; a prevention program that includes safety precautions and maintenance, monitoring, and employee training measures; and an emergency response program that spells out emergency health care, employee training measures, and procedures for informing the public and response agencies (e.g., fire department) should an accident occur.

Document and File Review

File reviews also included databases that were not a part of the EDR and were obtained from federal and state agencies concerning past, present, and future enforcement actions that could impact the proposed roadway improvement projects. Useful records in regulatory agency files included compliance inspection reports, enforcement notices, and contamination assessment reports. Other databases used in the evaluation included:

- Enforcement and Compliance History Online – This online database helps determine whether compliance inspections have been conducted by USEPA or state/local governments, if violations

were detected or enforcement actions were taken, and if penalties were assessed in response to environmental law violations.

- Clean Water Act Significant Non-Compliance – The National Pollutant Discharge Elimination System program uses the term Significant Non-Compliance (SNC). Examples of events that could result in an SNC code include unauthorized discharges; failure of a Publicly Owned Treatment Works to enforce its approved pretreatment program; failure to meet a construction deadline; failure to file a Discharge Monitoring Report; filing a Discharge Monitoring Report more than 30 days late; or violating any judicial or administrative order. Removal of the SNC designation occurs once the facility's Discharge Monitoring Report reports show a consistent pattern of compliance with permit limits, or if USEPA or a state agency issues a formal enforcement order to address the violations that resulted in the SNC and the facility has returned to compliance.
- RCRA SNC is a term used to describe a site determined to cause actual exposure or has a substantial likelihood of causing exposure to a hazardous waste or constituent; is a chronic or recalcitrant violator; or deviates substantially from the terms of a permit, order, or agreement, or from RCRA statutory or regulatory requirements. Under the RCRA program, the SNC is removed when the site is in full physical compliance with statutory and/or regulatory requirements.
- High Priority Violations is a term used in the Clean Air Act program. This is the most serious level of violation noted in USEPA databases.

Previous Studies

Several potential contamination sites (i.e., former landfills) are located within the property boundary of U.S. Department of Defense (DoD) lands and are adjacent to the roadway ROW or proximal to the proposed roadway projects (TEC JV 2009). These sites were investigated due to the potential for contamination migration if there is a need for construction dewatering, possibly drawing contaminants toward the proposed roadway improvements.

The reports and studies completed for the Andersen Air Force Base (AFB) Installation Restoration Program (IRP) Management and the Navy Military Munitions Response Program (MMRP), USEPA, GEPA, and other federal and local environmental regulatory programs were reviewed to obtain information on potential contamination sites that are within DoD lands and are adjacent or proximal to the proposed improvements (TEC JV 2009).

The current DoD ROI on Guam for hazardous materials and waste includes Air Force and Navy properties. Air Force properties include Andersen AFB, comprised of the main base, the munitions storage area, and Northwest Field; Andersen Administration Annex (Andersen South); and the Andersen Communications Annex Barrigada site near the Guam International Airport. Navy properties include the main naval base at Apra Harbor, Naval Computer and Telecommunications Station Finegayan, Finegayan South Housing Area, Naval Computer and Telecommunications Station Barrigada Transmitter Site, Naval Hospital area, Nimitz Hill, and the Ordnance Annex.

In 1986, Congress created the Defense Environmental Restoration Program (DERP). The DERP addresses the identification and cleanup of hazardous substances and military munitions remaining from past activities at DoD lands and FUDS. Within the DERP, the DoD created two program categories, namely the IRP and the Military Munitions Response Program.

On Guam, USEPA, DoD, and Government of Guam (GovGuam) have ongoing cleanup activities of DERP sites. The DoD and State/Territorial Memorandum of Agreement (DSMOA) established a program where GEPA staff work closely with DoD representatives to discuss and facilitate environmental

restoration and clean-up work on Guam. Under the DSMOA program, GEPA maintains regulatory oversight of environmental restoration efforts undertaken on Guam by the DoD to ensure compliance with applicable local and federal laws and regulations. The DSMOA oversees the following three DoD programs:

- Base Realignment and Closure – A clean-up program to ensure the environmental suitability of properties planned for subsequent transfer to GovGuam.
- IRP – The IRP focuses on cleaning up releases of hazardous substances that pose risks to the public and/or the environment at active, as well as Base Realignment and Closure and FUDS, military sites owned or used by the DoD. The IRP is the main DoD environmental restoration program that covers on base actions, such as the Orote landfill at COMNAV Marianas, Construction Battalion landfill clean-up at Finegayan, and Andersen AFB CERCLA actions.
- FUDS – A program managed by U.S. Army Corps of Engineers that is designed to clean up military sites that are no longer owned by the U.S. Government.

Munitions Response Program

In September 2001, the DoD established the MMRP to address hazards associated with munitions and explosives of concern within areas no longer used for operational range activities. These training areas that are no longer used as operational ranges are called munitions response areas. Munitions response areas often contain one or more discrete munitions response sites (Andersen AFB 2007a). In December 2001, Congress passed the National Defense Authorization Act. This Act required DoD to develop an initial inventory of areas not located within operational ranges (i.e., active or inactive ranges) that are known or suspected to contain munitions or explosives of concern.

As part of this inventory process, the DoD is coordinating with GEPA to conduct preliminary assessments and site inspections of areas of concern on Guam (GEPA 2009). As a result of these efforts, the following munitions response areas on Guam have been identified to date:

- Naval Magazine Small Arms Range
- Spanish Steps Skeet and Trap Ranges
- Orote Point Rifle and Pistol Range
- Naval Computer and Telecommunications Main Station Finegayan Skeet Range
- Naval Computer and Telecommunications Main Station Small Arms Range

Aerial Photography Review

A desktop review of project roadway plans and aerials was conducted (Google Earth, 2009).

Web Site Review

Available information on government Web sites was reviewed (Andersen AFB 2009, GEPA 2007, Navy 2007, OSHA 2006).

Field Reviews

Field reviews were conducted by Parsons Brinckerhoff in March/April 2008 and March 2009 to verify locations of potential contamination sites identified in previous reports, and to identify other potential contamination sites not included in previous studies. Since the EDR database reports did not provide exact addresses of sites, only zip codes, the identification of potential contamination sites heavily relied on the field review. Project team members walked the properties, where accessible, to identify potential contamination. The sites were evaluated for possible contamination risks to roadway ROW and potential

construction activities. Sites were also researched for evidence of documented contamination, apparent changes to the ground surface and landscaping, ground staining, standing liquids, odors, ventilation pipes, drums and other storage containers, and other indications of current or previous petroleum and hazardous materials use and/or storage. Limited telephone and onsite interviews were also conducted.

Potential petroleum and hazardous material sites adjacent to the proposed roadway improvements were identified and accessed when permission was given by the property owners. Potential contamination sites at DoD lands adjacent to the proposed improvements were observed and documented from the roadway ROW. Except for potential contamination sites within DoD lands or sites proximal to DoD lands, site photographs were obtained from potential petroleum and hazardous material sites that would be adjacent to proposed roadway improvements.

18.2.1.2 Determination of Significance

The determination of significance is based upon existing hazardous substance management practices, potential mitigation measures, and expected or potential impacts and environmental consequences with the planned actions. This determination evaluated the overall ability to mitigate or control environmental impacts and consequences to soils, surface water, groundwater, air, and biota. This determination considers current conditions and potential consequences relative to the anticipated ability of the hazardous substance management infrastructure system to accommodate added hazardous substance demand on the overall system. Specifically, for hazardous substances to be considered a significant impact, the following would have to occur:

- Leaks, spills, or releases of hazardous substances to environmental media (i.e., soils, surface water, groundwater, air, and/or biota) resulting in unacceptable risks to the environment.
- Violation of applicable federal, state, or local laws or regulations regarding the transportation, storage, handling, use, or disposal of hazardous substances.

18.2.1.3 Issues Identified during Public Scoping Process

As part of the analysis, concerns related Hazardous Materials and Waste that were mentioned by the public, including regulatory stakeholders, during the public scoping meetings were addressed. These include:

- Address management practices for hazardous substances, including hazardous wastes, toxic substances, hazardous materials, and ordnance.
- Describe the potential overall impacts of hazardous substances from construction and operation of proposed projects.
- Identify the projected hazardous waste types and volumes.
- Identify expected hazardous substance storage, disposal, and management plans.
- Evaluate measures to mitigate generation of hazardous waste including pollution prevention.
- Discuss how hazardous substances on land and from ships would be managed.
- Discuss the potential for impacts to environmental media from spills, accidents, and/or releases of hazardous substances.
- Identify existing installation restoration sites.

18.2.2 Power

18.2.2.1 Interim Alternative 1 (Preferred Alternative)

Interim Alternative 1 would recondition existing combustion turbines (CTs) and upgrade T&D systems

and would not require new construction or enlargement of the existing footprint of the facility. This work would be undertaken by the GPA on its existing permitted facilities. Reconditioning would be made to existing permitted facilities at the Marbo, Yigo, Dededo No. 1, and Macheche CTs. These combustion turbines are not currently being used up to permit limits. T&D system upgrades would be on existing above ground and underground transmission lines. This alternative supports Main Cantonment Alternatives 1 and 2 and Main Cantonment Alternatives 3 and 8 would require additional upgrades to the T&D system.

Hazardous Materials

The proposed activities for this alternative would result in the use of slightly more hazardous materials, particularly from the use of petroleum, lubricants, and oils (POL)/fuels for heavy equipment, vehicles, generators, and related activities. Operation of the upgraded facilities would also result in the use of POL/fuels, primarily for replacement, repair, or renovation activities. The conventional power plant fuel would be diesel No. 2 fuel.

It is estimated that about 1,500 pounds (lbs) (681 kilograms [kg]) of hazardous materials would be generated annually from these reconditioning/upgrade and operational activities. This estimate was based upon professional judgment and Defense Reuse and Marketing Office (DRMO) Guam hazardous material disposal data.

However, BMPs and SOPs would be used to:

- Prevent, contain, and/or clean up spills and leaks to protect the human health and environment
- Provide personnel training and operational protocol and procedures to protect human health and environment
- As necessary, expand DRMO's sufficient hazardous materials storage, transportation, and disposal capacity prior to any expected increases
- Protect overall human health, welfare, and the environment

This alternative could result in significant impacts to human health and the environment (i.e., soils, surface water, groundwater, air, and biota). However, these potential impacts would be controlled to less than significant through implementation of BMPs and SOPs (see Volume 7) that would include:

- Update/implement HMMPs.
- Update/implement Facility Response plans.
- Update/implement SPCC plans (e.g., training, spill containment and control procedures, cleanup, notifications).
- Ensure that DoD and subcontractor personnel are trained in proper labeling, container, storage, staging, and transportation requirements for hazardous materials. Ensure personnel are trained in accordance with spill prevention, control, and cleanup methods.
- Implement aggressive hazardous materials minimization plans that substitute non-hazardous materials for hazardous materials.
- As necessary, expand DRMO's sufficient hazardous materials storage, transportation, and disposal capacity prior to any expected increases
- Verify through surveillance and inspection that contractors fully implement federal, local, and DoD regulations including the use, storage, treatment, and disposal of hazardous materials. Verify that proper erosion control methods are used during construction activities. Implement corrective actions as necessary.

- Minimize the risk of uncontrolled spills and releases through industry-accepted methods for spill prevention, containment, control, and abatement.
- Minimize the use of contaminated sites for new construction. When new projects are planned on sites where contamination has been identified, ensure that the risk of human exposure to contaminated media is minimized through the use of a site-specific health and safety plan, engineering and administrative controls, and appropriate PPE.

Table 18.2-1 summarizes potential hazardous material impacts associated with reconditioning/upgrade activities and subsequent operations.

Table 18.2-1. Interim Alternative 1 Hazardous Material Consequences and Mitigation

Potential Activity (Cause)	*Potential Effect*	*Potential Impacts*	*Potential Mitigation Measures*
Hazardous materials use during reconditioning and subsequent operations	• Increased hazardous materials storage, use, handling, generation, and disposal • Increased fueling and POL operations • Possible use of contaminated site footprint(s) for reconditioning projects • Potential increased site runoff	• Spill or release impacts during construction activities • Impacts and increased risks to human health and/or the environment (soils, surface water, groundwater, or air), including terrestrial and ecosystems • Violations of applicable federal, state, local, or DoD laws and regulations during construction and demolition operations	• No potential mitigation measures are identified

Toxic Substances

The toxic substances of concern include asbestos-containing materials (ACM), lead-based paint (LBP), polychlorinated biphenyls (PCBs), and radon. Most uses of PCBs were banned by United States Environmental Protection Agency (USEPA) in 1979 and LBP was banned in 1978. The CTs proposed for reconditioning under Interim Alternative 1 were all installed in the 1990s. Additionally, the reconditioning of the CTs would not involve handling of ACM. Therefore, impacts from those toxic substances are not anticipated. However, in this case, existing handling and disposal procedures and protocol would be used and would result in less than significant impacts. Additionally, the proposed alternative would not require any new structure or facility at the GPA owned facilities and would not require radon resistant construction techniques.

Hazardous Waste

Expected increases in the use of hazardous wastes are judged to be relatively small as a result of these reconditioning and operation activities. It is estimated that about 750 lbs (341 kg) of hazardous waste would be generated annually from these activities. These wastes are anticipated to include adhesives, lubricants, solvents, and corrosive liquids. This estimate was based upon professional judgment and DRMO Guam hazardous waste disposal data.

Required BMPs and SOPs (see Volume 7) for handling and disposing of these hazardous wastes include: personnel training, proper use of spill prevention and control plans, implementation of hazardous waste management plans, proper execution of existing DRMO hazardous waste handling, transportation, use,

storage, and disposal protocol.

18.2.2.2 Interim Alternative 2

Interim Alternative 2 is a combination of reconditioning of existing permitted GPA facilities, an increase in operational hours for existing CTs, and upgrades to existing T&D systems. Interim Alternative 2 would not require new construction or enlargement of the existing footprint of the facility. Reconditioning would be performed on the existing permitted GPA facilities at the Marbo, Yigo, and Dededo CTs. This alternative supports Main Cantonment Alternatives 1 and 2 and Main Cantonment Alternatives 3 and 8 would require additional upgrades to the T&D system.

Potential impacts to hazardous materials and waste from implementation of Interim Alternative 2 would be similar to those discussed under Interim Alternative 1. Estimated quantities of hazardous materials and waste for Interim Alternative 2 would vary less than 1% of the Interim Alternative 1 estimates.

18.2.2.3 Interim Alternative 3

Interim Alternative 3 is a combination of reconditioning to existing GPA permitted facilities at Marbo, Yigo, and Dededo and upgrades to the DoD power plant at Orote. Upgrades would be made to existing T&D. The proposed reconditioning to the facilities at Marbo, Yigo, and Dededo include reconditioning of the existing power generation systems, which would not require new construction or enlargement of the existing footprint of the facility. For the Orote power plant, upgrades would include a new fuel storage facility to facilitate longer run times between refueling. This would disturb approximately 1 acre (4,047 square meters). This alternative supports Main Cantonment Alternatives 1 and 2 and Main Cantonment Alternatives 3 and 8 would require additional upgrades to the T&D system.

Potential impacts to hazardous materials and waste from implementation of Interim Alternative 3 would be similar to those discussed under Interim Alternative 1. Estimated quantities of hazardous materials and waste for Interim Alternative 3 would vary less than 2% of the Interim Alternative 1 estimates.

18.2.2.4 Summary of Impacts

Table 18.2-2 summarizes the potential impacts of each interim alternative. A text summary is provided below.

Table 18.2-2. Summary of Potential Hazardous Materials and Waste Impacts-Power

*Interim Alternative 1**	*Interim Alternative 2*	*Interim Alternative 3*
Soils, Surface Water, Groundwater, Air, and/or Biota Impacts		
LSI • Less than significant impacts would occur • As with all operations using hazardous substances, there is a possibility for an inadvertent leak, spill, or release • BMPs and SOPs would keep the frequency and magnitude of the potential leaks, spills, and releases low	LSI • Less than significant impacts would occur • As with all operations using hazardous substances, there is a possibility for an inadvertent leak, spill, or release • BMPs and SOPs would keep the frequency and magnitude of the potential leaks, spills, and releases low	LSI • Less than significant impacts would occur • As with all operations using hazardous substances, there is a possibility for an inadvertent leak, spill, or release • BMPs and SOPs would keep the frequency and magnitude of the potential leaks, spills, and releases low

Legend: LSI = Less Than Significant Impact. *Preferred Alternative.

In summary, the proposed increased power upgrade and operations could result in increased

environmental impacts. These potential impacts could result from increased transportation, handling, use, and disposal of hazardous materials and hazardous wastes. It is expected that the largest increases of hazardous materials would result from the use of POL/fuels. However, as per regulatory requirements, various controls would be used to prevent unintended releases of these substances. These controls include the following:

- Spill prevention control and countermeasures plans
- Facility Response plans
- Waste management plans
- Stormwater pollution prevention plans
- Hazardous material/waste management plans (e.g., asbestos management plans and lead-based management plans, etc.)
- Mandatory personnel hazardous material and hazardous waste training
- Waste minimization plans
- Waste labeling, storage, packaging, staging, and transportation procedures
- DoD waste regulations
- Federal and territorial laws and regulations

Despite expected increases in hazardous materials and hazardous wastes, no significant impacts are anticipated as long as the controls discussed above are properly implemented and related plans and procedures updated and modified as appropriate to meet the potential increased demand upon DRMO regarding hazardous substance transportation, handling, storage, use, and disposal.

18.2.3 Potable Water

As discussed in Volume 6 Chapter 2 (Section 2.2.2), potable water alternatives 1 and 2 are not distinguished as interim or long-term as they meet the requirements for both interim and long-term.

18.2.3.1 Basic Alternative 1 (Preferred Alternative)

Basic Alternative 1 would consist of installation of up to 22 new potable water supply wells at Andersen AFB, rehabilitation of existing wells, interconnection with the GWA water system, and associated T&D systems. A new 5 MG (19 ML) water storage tank would be constructed at ground level at Finegayan.

Hazardous Materials

The proposed activities for this alternative would result in the use of slightly more hazardous materials as compared with existing quantities. These increases are expected particularly from the use of POL/fuels for heavy equipment, vehicles, generators, and related activities. Operation of the upgraded facilities would also result in the use of POL/fuels, primarily for replacement, repair, or renovation activities. It is estimated that about 750 lbs (341 kg) of hazardous materials would be generated annually from these activities. This estimate was based upon professional judgment and DRMO Guam hazardous material disposal data.

However, BMPs and SOPS would be used to:

- Prevent, contain, and/or clean up spills and leaks to protect the human health and environment.
- Provide personnel training and operational protocol and procedures to protect human health and environment.
- As necessary, expand DRMO's sufficient hazardous materials storage, transportation, and disposal capacity prior to any expected increases.
- Protect overall human health, welfare, and the environment.

This alternative could result in significant impacts to human health and the environment (i.e., soils, surface water, groundwater, air, and biota). However, these potential impacts would be controlled to less than significant through implementation of BMPs and SOPs (see Volume 7) that would include:

- Update/implement HMMPs.
- Update/implement Facility Response plans.
- Update/implement SPCC plans (e.g., training, spill containment and control procedures, cleanup, notifications).
- Ensure that DoD and construction subcontractor personnel are trained in proper labeling, container, storage, staging, and transportation requirements for hazardous materials. Ensure personnel are trained in accordance with spill prevention, control, and cleanup methods.
- Implement aggressive hazardous materials minimization plans that substitute non-hazardous materials for hazardous materials.
- As necessary, expand DRMO's sufficient hazardous materials storage, transportation, and disposal capacity prior to any expected increases
- Verify through surveillance and inspection that construction contractors fully implement federal, local, and DoD regulations including the use, storage, treatment, and disposal of hazardous materials. Verify that proper erosion control methods are used during construction activities. Implement corrective actions as necessary.
- Minimize the risk of uncontrolled spills and releases through industry-accepted methods for spill prevention, containment, control, and abatement.
- Minimize the use of contaminated sites for new projects. When new projects are planned on sites where contamination has been identified, ensure that the risk of human exposure to contaminated media is minimized through the use of a site-specific health and safety plan, engineering and administrative controls, and appropriate PPE.

Table 18.2-3 summarizes potential hazardous material impacts associated with these upgrade activities and subsequent operations.

Table 18.2-3. Alternative 1 Hazardous Material Construction Consequences and Mitigation

Potential Activity (Cause)	*Potential Effect*	*Potential Impacts*	*Potential Mitigation Measures*
Hazardous materials use during upgrades and subsequent operations	• Increased hazardous materials storage, use, handling, generation, and disposal • Increased fueling and POL operations • Possible use of contaminated site footprint(s) for new projects • Potential increased site runoff	• Spill or release impacts during upgrade activities • Adverse impacts and increased risks to human health and/or the environment, including terrestrial and marine ecosystems • Violations of applicable federal, state, local, or DoD laws and regulations during upgrade and demolition operations • Increased risk of contamination of environmental media	• No potential mitigation measures are identified

Toxic Substances

The primary toxic substances being addressed on Guam regardless of any DoD expansion include ACM, LBP, PCBs, and radon. ACM, LBP, and PCBs are not expected to result in additional impacts because LBPs were banned in 1978, most uses of PCBs banned in 1979, and ACM would not be used in new utilities infrastructure facilities.

Radon could seep into facilities and/or structures. However, radon resistant construction techniques would be used and DoD would periodically test facilities constructed in known radon zones to verify that no unacceptable radon gas buildup occurs. As appropriate, radon mitigation measures would be installed.

Hazardous Waste

Expected increases in the use of hazardous waste are judged to be negligible as a result of these existing potable water upgrade activities. It is estimated that about 375 lbs (171 kg) of hazardous waste would be generated annually from these upgrade and operational activities. These wastes are anticipated to include adhesives, lubricants, solvents, and corrosive liquids. This estimate was based upon professional judgment and DRMO Guam hazardous waste disposal data. No potential mitigation measures would be required.

Required BMPs and SOPs (see Volume 7) for these hazardous wastes include: personnel training, proper use of spill prevention and control plans, implementation of hazardous waste management plans, proper execution of existing DRMO hazardous waste handling, transportation, use, storage, and disposal protocol.

18.2.3.2 Basic Alternative 2

Basic Alternative 2 would consist of installation of up to 20 new potable water supply wells at Andersen Air Force Base (AFB), up to 11 new potable water supply wells at Barrigada, rehabilitation of existing wells, interconnection with the GWA water system, associated transmission and distribution systems.

Additionally, a new 3.6 MG (13.6 ML) and a new 1 MG (3.8 ML) water storage tanks would be constructed at ground level at Finegayan and Barrigada, respectively.

Potential impacts to hazardous materials and waste from implementation of Basic Alternative 2 would be similar to those discussed under Alternative 1. Estimated quantities of hazardous materials and waste for Alternative 2 would vary less than 2% of the Alternative 1 estimates.

18.2.3.3 Summary of Impacts

Table 18.2.4 summarizes the potential impacts of each action alternative. A text summary is provided below.

Table 18.2-4. Summary of Potential Hazardous Materials and Waste Impacts-Potable Water

*Basic Alternative 1**	*Basic Alternative 2*
Soils, Surface Water, Groundwater, Air, and/or Biota Impacts	
LSI • Less than significant impacts would occur • As with all operations using hazardous substances, there is a possibility for an inadvertent leak, spill, or release • BMPs and SOPs would keep the frequency and magnitude of the potential leaks, spills, and releases low	LSI • Less than significant impacts would occur • As with all operations using hazardous substances, there is a possibility for an inadvertent leak, spill, or release • BMPs and SOPs would keep the frequency and magnitude of the potential leaks, spills, and releases low

Legend: LSI = Less Than Significant Impact. *Preferred Alternative.

In summary, the proposed potable water upgrade project could result in increased environmental impacts. These potential impacts could result from increased transportation, handling, use, and disposal of hazardous materials and hazardous wastes. It is expected that the largest increases of hazardous materials would result from the use of POL/fuels. Expected increases in the use of hazardous waste are judged to be negligible, but could include solvents, corrosive or toxic liquids, and aerosols.

Various controls are in place to prevent unintended releases of these substances. These controls include the following:

- Spill prevention control and countermeasures plans
- Facility response plans
- Waste management plans
- Stormwater pollution prevention plans
- Hazardous material/waste management plans (e.g., asbestos management plans and lead-based management plans, etc.)
- Mandatory personnel hazardous material/waste training
- Waste minimization plans
- Waste labeling, storage, packaging, staging, and transportation procedures
- DoD waste regulations
- Federal and territorial laws and regulations

Despite expected increases in hazardous materials and hazardous wastes, no significant impacts are anticipated as long as the controls discussed above are properly implemented and related plans and procedures updated and modified as appropriate to meet the potential increased demand upon DRMO regarding hazardous substance transportation, handling, storage, use, and disposal.

18.2.4 Wastewater

18.2.4.1 Basic Alternative 1 (Preferred Alternative) and 1b

Basic Alternative 1 (Basic Alternative 1a supports Main Cantonment Alternatives 1 and 2; and Basic Alternative 1b supports Main Cantonment Alternatives 3 and 8) combines upgrade to the existing primary treatment facilities and expansion to secondary treatment at the Northern District Wastewater Treatment Plant (NDWWTP). The difference between Basic Alternatives 1a and 1b is a requirement for a new sewer line from Barrigada housing to NDWWTP for Basic Alternative 1b.

Hazardous Materials

The proposed activities for this alternative would result in the use of slightly more hazardous materials, particularly from the use of POL/fuels for heavy equipment, vehicles, generators, and related activities. Operation of the upgraded facilities would also result in the use of POL/fuels, primarily for replacement, repair, or renovation activities. It is estimated that about 525 lbs (238 kg) of hazardous materials would be generated annually from these upgrade and operational activities. This estimate was based upon professional judgment and DRMO Guam hazardous material disposal data. No potential mitigation measures would be required.

However, BMPs and SOPs would be used to:

- Prevent, contain, and/or clean up spills and leaks to protect the human health and environment.
- Provide personnel training and operational protocol and procedures to protect human health and environment.
- As necessary, expand DRMO's sufficient hazardous materials storage, transportation, and disposal capacity prior to any expected increases.
- Protect overall human health, welfare, and the environment.

This Alternative could result in significant impacts to human health and the environment (i.e., soils, surface water, groundwater, air, and biota). However, these potential impacts would be controlled to less than significant through implementation of BMPs and SOPs (see Volume 7) that would include:

- Update/implement HMMPs.
- Update/implement Facility Response plans.
- Update/implement SPCC plans (e.g., training, spill containment and control procedures, cleanup, notifications).
- Ensure that DoD and subcontractor personnel are trained in proper labeling, container, storage, staging, and transportation requirements for hazardous materials. Ensure personnel are trained in accordance with spill prevention, control, and cleanup methods.
- Implement aggressive hazardous materials minimization plans that substitute non-hazardous materials for hazardous materials.
- As necessary, expand DRMO's sufficient hazardous materials storage, transportation, and disposal capacity prior to any expected increases
- Verify through surveillance and inspection that contractors fully implement federal, local, and DoD regulations including the use, storage, treatment, and disposal of hazardous materials. Verify that proper erosion control methods are used during construction activities. Implement corrective actions as necessary.
- Minimize the risk of uncontrolled spills and releases through industry-accepted methods for spill prevention, containment, control, and abatement.

- Minimize the use of contaminated sites for new projects. When new projects are planned on sites where contamination has been identified, ensure that the risk of human exposure to contaminated media is minimized through the use of a site-specific health and safety plan, engineering and administrative controls, and appropriate PPE.

Table 18.2-5 summarizes potential hazardous material impacts associated with these upgrade activities and subsequent operations.

Table 18.2-5. Interim Alternative 1 Hazardous Material Construction

Potential Activity (Cause)	*Potential Effect*	*Potential Impacts*	*Potential Mitigation Measures*
Hazardous materials use during upgrade activities and subsequent operations	• Increased hazardous materials storage, use, handling, generation, and disposal • Increased fueling and POL operations • Possible use of contaminated site footprint(s) for new projects • Potential increased site runoff	• Spill or release impacts during upgrade activities • Adverse impacts and increased risks to human health and/or the environment, including terrestrial and marine ecosystems • Violations of applicable federal, state, local, or DoD laws and regulations during construction and demolition operations • Increased risk of contamination of environmental media	• No potential mitigation measures are identified

Toxic Substances

The primary toxic substances being addressed on Guam regardless of any DoD expansion include ACM, LBP, PCBs, and radon. ACM, LBP, and PCBs are not expected to result in additional impacts because LBPs were banned in 1978, most uses of PCBs banned in 1979, and ACM would not be used in new utilities infrastructure facilities.

Radon could seep into the facilities and/or structures. However, radon resistant construction techniques would be used and DoD would periodically test facilities constructed in known radon zones to verify that no unacceptable radon gas buildup occurs. As appropriate, radon mitigation measures would be installed.

Hazardous Waste

Expected increases in the use of hazardous wastes are judged to be small as a result of these existing wastewater upgrade activities. It is estimated that about 160 lbs (73 kg) of hazardous waste would be generated annually from these activities. These wastes are anticipated to include adhesives, lubricants, solvents, and corrosive liquids. This estimate was based upon professional judgment and DRMO Guam hazardous waste disposal data. No potential mitigation measures would be required.

Required BMPs and SOPs (see Volume 7) for these hazardous wastes include: personnel training, proper use of spill prevention and control plans, implementation of hazardous waste management plans, proper execution of existing DRMO hazardous waste handling, transportation, use, storage, and disposal

protocol.

18.2.4.2 Summary of Impacts

Table 18.2-6 summarizes the potential impacts of each interim alternative. A text summary is provided below.

Table 18.2-6. Summary of Potential Hazardous Materials and Waste Impacts-Wastewater

*Basic Alternative 1a**	*Basic Alternative 2a*
Soils, Surface Water, Groundwater, Air, and/or Biota Impacts	
LSI • Less than significant adverse impacts would occur • As with all operations using hazardous substances, there is a possibility for an inadvertent leak, spill, or release • BMPs and SOPs would keep the frequency and magnitude of the potential leaks, spills, and releases low	LSI • Less than significant adverse impacts would occur • As with all operations using hazardous substances, there is a possibility for an inadvertent leak, spill, or release BMPs and SOPs would keep the frequency and magnitude of the potential leaks, spills, and releases low

Legend: LSI = Less Than Significant Impact. *Preferred Alternative.

In summary, the proposed wastewater project could result in increased environmental impacts. These potential impacts could result from increased transportation, handling, use, and disposal of hazardous materials and hazardous wastes. It is expected that the largest increases of hazardous materials would result from the use of POL/fuels. Expected increases in the use of hazardous waste are judged to be negligible, but could include solvents, corrosive or toxic liquids, and aerosols.

Various controls are in place to prevent unintended releases of these substances. These controls include the following:

- Spill prevention control and countermeasures plans
- Facility response plans
- Waste management plans
- Stormwater pollution prevention plans
- Hazardous material management plans (e.g., asbestos management plans and lead-based management plans, etc.)
- Mandatory personnel hazardous material and hazardous waste training
- Waste minimization plans
- Waste labeling, storage, packaging, staging, and transportation procedures
- DoD waste regulations
- Federal and territorial laws and regulations

Despite expected increases in hazardous materials and hazardous wastes, no significant impacts are anticipated as long as the controls discussed above are properly implemented and related plans and procedures updated and modified as appropriate to meet the potential increased demand upon DRMO regarding hazardous substance transportation, handling, storage, use, and disposal.

18.2.5 Solid Waste

18.2.5.1 Basic Alternative 1 (Preferred Alternative)

The Preferred Alternative for solid waste would be the continued use of Navy Landfill at Apra Harbor

until Layon Landfill is opened, which is scheduled for July 2011. This alternative does not involve any construction activities.

Hazardous Materials

Since there would be no construction activities and operations would not differ from current practice, there would be less than significant potential impact in the generation of hazardous materials. The proposed activities would result in the use of approximately the same quantity of hazardous materials. These would include POL/fuels for heavy equipment used in landfill operations, generators, and related activities. Operation of the facilities would result in the use of POL/fuels, primarily for replacement, repair, or renovation activities. It is estimated that about 450 lbs (204 kg) of hazardous materials would be generated annually from these operational activities. This estimate was based upon professional judgment and DRMO Guam hazardous material disposal data.

However, BMPs and SOPs would be used to:

- Prevent, contain, and/or clean up spills and leaks to protect the human health and environment
- Provide personnel training and operational protocol and procedures to protect human health and environment
- As necessary, expand DRMO's sufficient hazardous materials storage, transportation, and disposal capacity prior to any expected increases
- Protect overall human health, welfare, and the environment

This Alternative could result in significant impacts to human health and the environment (i.e., soils, surface water, groundwater, air, and biota). However, these potential impacts would be controlled to less than significant through implementation of BMPs and SOPs (see Volume 7) that would include:

- Ensure personnel are trained in accordance with spill prevention, control, and cleanup methods.
- Implement aggressive hazardous materials minimization plans that substitute non-hazardous materials for hazardous materials.
- Update and implement facility response plans.
- As necessary, expand DRMO's sufficient hazardous materials storage, transportation, and disposal capacity prior to any expected increases.
- Verify through surveillance and inspection that contractors fully implement federal, local, and DoD regulations including the use, storage, treatment, and disposal of hazardous materials. Verify that proper erosion control methods are used during construction activities. Implement corrective actions as necessary.
- Minimize the risk of uncontrolled spills and releases through industry-accepted methods for spill prevention, containment, control, and abatement.

Table 18.2-7 summarizes potential hazardous material impacts associated with these operations activities.

Table 18.2-7. Hazardous Material Consequences and Mitigation

Potential Activity (Cause)	*Potential Effect*	*Potential Impacts*	*Potential Mitigation Measures*

Potential Activity (Cause)	*Potential Effect*	*Potential Impacts*	*Potential Mitigation Measures*
Hazardous materials use during operations activities	• Continued use hazardous materials storage, use, handling, generation, and disposal • Continued fueling and POL operations	• Adverse impacts and increased risks to human health and/or the environment, including terrestrial and marine ecosystems • Increased risk of contamination of environmental media	• No potential mitigation measures are identified

Toxic Substances

The primary toxic substances being addressed on Guam regardless of any DoD expansion include ACM, LBP, PCBs, and radon. ACM, LBP, and PCBs are not expected to result in additional impacts because LBPs were banned in 1978, most uses of PCBs banned in 1979, and ACM would not be used in new utilities infrastructure facilities.

Radon could seep into facilities and/or structures. DoD would periodically test facilities located in known radon zones to verify that no unacceptable radon gas buildup occurs. As appropriate, radon mitigation measures would be installed.

Hazardous Waste

It is estimated that about 250 lbs (113 kg) of hazardous waste would be generated annually from these activities. These wastes are anticipated to include adhesives, lubricants, solvents, and corrosive liquids. This estimate was based upon professional judgment and DRMO Guam hazardous waste disposal data.

Required BMPs and SOPs (see Volume 7) for these hazardous wastes include: personnel training, proper use of spill prevention and control plans, implementation of hazardous waste management plans, proper execution of existing DRMO hazardous waste handling, transportation, use, storage, and disposal protocol.

18.2.5.2 Summary of Impacts

Table 18.2-8 summarizes the potential impacts of each interim alternative. A text summary is provided below.

Table 18.2-8. Summary of Potential Hazardous Materials and Waste Impacts-Solid Waste

*Basic Alternative 1**
Soils, Groundwater, Surface Water, Air, and Biota LSI • Less than significant adverse impacts would occur • As with all operations using hazardous substances, there is a possibility for an inadvertent leak, spill, or release • BMPs and SOPs would keep the frequency and magnitude of the potential leaks, spills, and releases low

Legend: LSI = Less Than Significant Impact. *Preferred Alternative.

In summary, the proposed solid waste alternatives could result in increased environmental impacts. These potential impacts could result from increased transportation, handling, use, and disposal of hazardous

materials and hazardous wastes. It is expected that the largest increases of hazardous materials would result from the use of POL/fuels. Expected increases in the use of hazardous wastes are judged to be negligible, but could include solvents, corrosive or toxic liquids, and aerosols.

Various controls are in place to prevent unintended releases of these substances as are procedures that are activated in the event of a spill or release. These controls include the following:

- Spill prevention control and countermeasures plans
- Facility response plans
- Waste management plans
- Stormwater pollution prevention plans
- Hazardous material/waste management plans (e.g., asbestos management plans and lead-based management plans, etc.)
- Mandatory personnel hazardous material and hazardous waste training
- Waste minimization plans
- Waste labeling, storage, packaging, staging, and transportation procedures
- DoD waste regulations
- Federal and territorial laws and regulations

Despite expected increases in hazardous materials and hazardous wastes, no significant impacts are anticipated as long as the controls discussed above are properly implemented and related plans and procedures updated and modified as appropriate to meet the potential increased demand upon DRMO regarding hazardous substance transportation, handling, storage, use, and disposal.

18.2.6 Off Base Roadways

The proposed roadway, bridge, and intersection improvements may involve the use of hazardous materials and the generation of hazardous materials and hazardous wastes. Waste can be generated during bridge demolition, bridge construction and painting, roadway pavement markings, wall and fence painting, construction equipment/machinery maintenance and repair, and demolishing of structures acquired from ROW acquisition, and from excavation of materials containing hazardous substances. The following discussion of hazardous materials use and hazardous waste generation applies to all of the action alternatives.

Potential hazardous materials associated with roadway and bridge construction include, but are not limited to:

- Product paint for bridges, poles, fences, walls, and roadway pavement markings
- Penetrating sealer (i.e., Methaylmethacrylate), modified mortar, and litex
- Coal tar epoxy for injecting in cracks
- Painting equipment cleaning solvents
- Diesel fuel contained in aboveground storage tanks (ASTs) to fuel construction equipment
- Unleaded gasoline contained in ASTs to fuel vehicles
- Engine solvents and degreasers
- Motor oil, gear oil, and other engine lubricants
- Potentially hazardous dredged material
- Potentially hazardous drill cuttings

Potential hazardous substances generated by roadway and bridge construction include, but are not limited to the following:

- Excavated underground storage tanks (USTs) containing petroleum, oil, and lubricants (POL)
- Excavated electrical transformers and capacitors containing PCBs
- Petroleum-contaminated soil and groundwater
- Asbestos and asbestos-containing materials (ACMs)
- Sandblasting wastes not determined to be hazardous wastes
- Potentially hazardous dredged material not determined to be hazardous wastes
- Potentially hazardous drill cuttings not determined to be hazardous wastes

Potential hazardous wastes that could be generated from roadway and bridge construction include:

- Waste paint
- Paint and sealant removal wastes
- Waste paint cleaning solvents and rags
- Waste fuel removed from machinery
- Waste engine solvents and degreasers
- Used oil and lubricants
- Waste antifreeze

The management, use, and storage of these hazardous materials and hazardous wastes on roadway projects are governed under the provisions of the American Association of State Highway and Transportation Officials (AASHTO) Guidelines for Painting Structures (1997), AASHTO Standard Specifications for Transportation Material and Method of Sampling and Testing (2005), and AASHTO Policy on Geometric Design of Highways and Streets, Maintenance of Traffic Through Construction Areas, page 301-303 (2001).

The management, storage, and disposal of hazardous wastes are regulated under the USEPA Resource Conservation and Recovery Act (RCRA) and Hazardous and Solid Waste Amendments (HSWA), and are enforced by the GEPA Hazardous Waste Management Program (HWMP) (USEPA 1997, 2005, 2007, 2008a, 2008b; Andersen AFB 2007b).

Hazardous materials disposal and the disposal of POL, PCBs, ACMs, and other hazardous substances are regulated by GEPA.

To mitigate any potential impacts from hazardous materials and hazardous wastes, management plans would be developed in accordance with applicable federal and territorial laws, and they would be implemented during road construction activities. With implementation of BMPs and SOPs, impacts would be less than significant for hazardous materials used and hazardous wastes generated during roadway construction.

Of the 123 potentially contaminated sites on Guam, 17 sites were identified having known or likely soil and/or water contamination within, or adjacent to, the Guam Road Network (GRN) project areas. The 17 sites were shown by region in figures located in the Hazardous Materials and Waste chapter in Volume 2. Detailed information on each of the 123 sites is provided in Volume 9, Appendix G-3.

To identify the potential environmental impacts from contaminated sites on GRN project construction, the nature of each GRN project activity in the affected area was considered. A key factor in determining the potential for environmental effects was the specific type of roadway project that would occur in a given area where known or likely soil or groundwater contamination may be present.

Each of the four action alternatives would result in construction and operation of a set of individual

roadway improvement projects on Guam. Implementation of each alternative would result in construction activities in each of the four geographic regions. Construction activities would consist of intersection improvements, bridge replacements, pavement strengthening, road relocation, road widening, and construction of a new road. While many projects would involve construction work in developed and paved areas, some roadway projects could result in soil intrusion that could encounter areas of contamination. Since all roadway project types would generally require construction activities that would involve the use of heavy construction equipment, the potential for leaks or spills of potentially hazardous materials would be common for all project types. A preliminary screening of project types and potential effects from contaminated soil or groundwater is provided in Table 18.2-9.

Table 18.2-9. Potential Effects from Contaminated Soils for GRN Roadway Project Types

Item	*Project Type*	*Description of Construction Activities*	*Potential Effect from Contaminated Soils*
1	Intersection Improvement (including military access points [MAPs])	Installation of new traffic loop sensors, extending lanes through the intersection, striping and paving to include new approach or turn lanes, reconfiguring intersection shapes (i.e., from Y-intersection to T-intersections), combining lanes, creating shared lanes, restriping, signalization modifications or upgrades, and grade separations.	Generally, intersection improvement work would not result in contact with subsurface soils. The potential for impacts from contaminated soils would be present only when reconfiguration or grade separations include excavation, trenching, or grading into the subsoil.
2	Bridge Replacement	Bridge replacement would be conducted in phases. The new bridge structure would be lengthened to adequately accommodate the hydraulic flow of the river. The width of the new structure would accommodate more or wider lanes and a median, with sidewalks and barriers on each side.	Bridge replacement can include excavation, trenching, or grading into the subsoil. Although soils would be affected when foundation work requires excavation beneath the existing bridge structure and utility work would require new trenching. No ROW acquisition would be required because bridges would be replaced within the footprint of the existing bridge.
3	Pavement Strengthening	Existing asphalt pavement sections would be strengthened by rehabilitating the existing pavement materials in place and placing an asphalt overlay or by reconstructing with new materials. The widened pavement section would be constructed of residual material from the existing pavement rehabilitation, new material, or a combination thereof, and an asphalt overlay. Pavement strengthening would also include matching existing access connections, pavement striping, signing, intelligent traffic systems, and safety lighting. The project would match existing horizontal and vertical alignment as required. Minor realignment of the road may be necessary to accommodate design elements.	Physical disturbance to soils from pavement strengthening would only occur when pavements are widened, new traffic systems or devices are installed, or minor road realignment occurs in previously undisturbed ground. Most activities associated with pavement strengthening would not require soil intrusion. For this reason, the potential for impacts from contaminated sites is considered to be low.

Table 18.2-9. Potential Effects from Contaminated Soils for GRN Roadway Project Types

Item	*Project Type*	*Description of Construction Activities*	*Potential Effect from Contaminated Soils*
4	Road Relocation (Route 15 only)	Route 15 would be realigned to accommodate the location of military firing ranges. New asphalt pavement would be constructed on the new alignment. The roadway cross section would consist of one lane in each direction, outside shoulders and inside shoulders, with an unpaved median that would accommodate future widening. Bicycles would be accommodated in the outside shoulders of the shared roadway. Alternatively, future widening would be accommodated to the outside, and the roadway cross section would consist of two lanes and outside shoulders with a paved median. Realignment would also include construction of new bridge(s) to grade separate Route 15 and the frontage road(s), obliterating existing Route 15 pavement, building removal, connecting to existing roadways or other access roads, utility relocation, pavement striping, signing, property fence, and guardrail installation.	Realignment into previously undisturbed soils may be required to accommodate design of the roadway. This activity would require building removal and relocation of existing utilities. For this reason, there is a potential for impacts from contaminated sites in the area.
5	Road Widening	New lanes would be added to an existing roadway to accommodate predicted increased traffic volumes and to relieve congestion caused by an increase in traffic volumes due to buildup activities. Widening would result in rebuilding the entire roadway, including removing the existing roadway segment. A new sub-base, base course, asphalt, and friction course layers would be constructed.	Road widening activities would affect soil when the footprint of the roadway extends into previously undisturbed soils. For this reason, there is a potential for impacts from contaminated sites in the area.
6	Construction of New Road	The Finegayan Connection would be constructed on a new alignment with new asphalt pavement on a compacted base or engineered fill.	New road construction would affect soil when the footprint of the roadway extends into previously undisturbed soils. For this reason, there is a potential for impacts from contaminated sites in the area.
7	Other	Temporary placement of equipment laydown or construction staging areas may be required.	Equipment laydown or construction staging areas associated with any of the above project types may require clearing and other disturbance of soils. For this reason, there is a potential for impacts from contaminated sites in the area.

Potential impacts from hazardous waste contamination in soil or groundwater can be detrimental to roadway construction activities. While it is unlikely that groundwater contamination would lead to direct impacts to roadway construction at the ground level, contaminated soil may require removal or remediation. Direct impacts that result in physical soil loss could occur during construction, while indirect impacts can result from the completed project (e.g., contaminants leach into soils). Based on the anticipated activities associated with each project type, it was determined that:

- Intersection improvements and pavement strengthening projects represent the project types with the lowest potential for impacts from hazardous waste contamination in soil or groundwater. Bridge

replacement projects using the same footprint for footings and other structures (i.e., no additional ROW required) would also represent a low potential for impacts. These projects would involve the least amount of physical soil disturbance because most work would occur upon existing pavements or developed areas.

- The placement of temporary equipment laydown areas at any of the GRN project work sites would represent a moderate potential for impacts from hazardous waste contamination in soil or groundwater only when the use of previously undisturbed areas are selected. To avoid this impact, previously disturbed (e.g., paved) areas adjacent to the work site would be selected for use as temporary construction staging areas or storage for roadway demolition materials whenever possible. Heavy equipment would be used, and leaks or spills of contaminants could occur at equipment staging areas.
- Road relocation, road widening, and construction of the new road would represent the greatest potential for impacts from hazardous waste contamination in soil or groundwater because these projects would result in the greatest degree of soil intrusion.

Certain proposed roadway improvements in the North and Central regions would require the acquisition of additional ROW on residential, business, or military land (refer to the Socioeconomics section of Volume 6). The potential for contamination would vary depending on the type of land to be acquired. In some cases, it is possible that the likelihood of contamination may be greater beneath certain business properties than beneath residential properties. The potential for contaminant migration to the roadway ROW would require further assessment after alignment selection to determine the actual presence and/or levels of contamination and the possible need for remedial action. Roadway projects with ROW acquisition may require actions such as avoidance or minimization during the design phase and before construction.

Indirect impacts from the roadway projects would be associated with contaminants leaching into soils. The potential for contaminants leaching into the soil would be prevented or managed through implementation of spill prevention and emergency spill response procedures.

18.2.6.1 Alternative 1

Roadway projects can be impacted by contaminated sites that are in close proximity to the roadway alignments. There are 49 projects that would occur as a result of implementation of Alternative 1. The effects of potentially contaminated sites to these projects are discussed below.

North

Alternative 1 includes 13 projects in the North region. GRN #8, 10, and 22A are adjacent or proximal to four potentially contaminated sites (Site Nos. 1, 8, 9, and 13). GRN #8 and 22A are pavement strengthening projects, with minimal potential for soil intrusion. Partial ROW acquisition would be required for GRN #22A.

GRN #10 is a road widening project that would require partial ROW acquisition along Route 3. Due to potential contamination from Site No. 8 (Potts Junction Tank Farm), avoidance measures would be required to ensure that construction does not occur on contaminated soil or is managed to avoid ongoing remediation efforts to the maximum extent possible.

Roadway projects in the North region also include intersection improvements and construction of a new road. Although no known contaminated sites have been identified near any of these projects, some

projects may require ROW acquisitions, and temporary construction staging areas may require soil intrusion. Due to the need for ROW acquisition and/or soil intrusion at these project locations, avoidance measures would be required to ensure that construction does not occur on contaminated soil or is managed to avoid ongoing remediation efforts to the maximum extent possible.

Central

Alternative 1 includes 27 projects in the Central region. GRN #6, 13, 15, 17, and 33 are adjacent or proximal to eight potentially contaminated sites (Site Nos. 14, 25, 33, 44, 47, 57, 58, and 62). All of these GRN projects are pavement strengthening projects, with minimal potential for soil intrusion. Partial ROW acquisition would be required for GRN #13, 17, and 33.

Roadway projects in the Central region also include intersection improvements, bridge replacements, road relocations, and road widening. Although no known contaminated sites have been identified near any of these projects, some projects may require ROW acquisitions, and temporary construction staging areas may require soil intrusion. For these reasons, avoidance measures would be required to ensure that construction does not occur on contaminated soil or is managed to avoid ongoing remediation efforts to the maximum extent possible.

Apra Harbor

Alternative 1 includes five projects in the Apra Harbor region. GRN # 4 and 26 are adjacent or proximal to five potentially contaminated sites (Site Nos. 111, 113, 114, 117, and 118). GRN #4 and 26 are pavement strengthening projects, with minimal potential for soil intrusion. Partial ROW acquisition would be required for both of these GRN projects.

Roadway projects in the Apra Harbor region also include intersection improvements that would have a low potential for ground intrusion. No ROW acquisition would be required for any projects in the Apra Harbor region. Avoidance measures would be required only for temporary construction staging areas to ensure that construction does not occur on contaminated soil or is managed to avoid ongoing remediation efforts to the maximum extent possible.

South

Alternative 1 includes four projects in the South region. No potentially contaminated sites of concern were identified in the South region. The roadway projects in the South region are not located in areas where potentially contaminated sites exist or would have influence on the proposed roadway improvements.

Roadway projects in the South region are limited to pavement strengthening and intersection improvements that would have a low potential for ground intrusion. No ROW acquisition would be required for any projects in the South region. Avoidance measures would be required only for temporary construction staging areas to ensure that construction does not occur on contaminated soil or is managed to avoid ongoing remediation efforts to the maximum extent possible.

BMPs and SOPs

BMPs and SOPs to avoid or minimize the impact of hazardous materials include the following:

- Roadway construction contractors shall be required to manage, store, and dispose of hazardous wastes in accordance with applicable USEPA RCRA and HSWA requirements.
- Roadway construction contractors shall be required to dispose of all POL, PCBs, ACMs, and other hazardous substances in accordance with GEPA regulations.

With implementation of the hazardous materials and hazardous waste management plans, impacts would be less than significant for hazardous materials used and hazardous wastes generated during roadway construction.

BMPs and SOPs to avoid or minimize the impact of contaminated sites for the proposed roadway improvements are as follows:

- A Phase 2 environmental site assessment may be conducted for ROW acquisition associated with GRN #10 (road widening along Route 3 – Naval Computer and Telecommunications Station (NCTS) Finegayan to Route 9) to determine potential contamination in the vicinity of the Potts Junction Tank Farm. The construction contractor may be required to implement avoidance measures to ensure that construction (a) does not occur on contaminated soil; and (b) is managed to avoid any ongoing remediation efforts to the maximum extent possible.
- A Phase 2 environmental site assessment may be conducted for roadway projects with ROW acquisitions of non-residential property. Roadway construction shall be conducted in accordance with the recommendations of the Phase 2 environmental site assessment. Depending on the extent of contamination at a specific site, excavation and removal of soil and/or groundwater contamination may be required before roadway construction can commence.
- Final design of roadway projects may include an evaluation of potential contamination for the following categories: (1) intersection improvements and pavement strengthening projects that require ROW acquisition of non-residential property; (2) intersection improvement projects that require reconfiguration or grade separation involving excavation, trenching, or grading into the subsoil; (3) bridge replacement projects that require excavation, trenching, or grading into the subsoil and exceeds the existing footprint of the bridge structure; (4) pavement strengthening that occurs in previously undisturbed ground; (5) road realignment into previously undisturbed soils or that requires building removal and/or relocation of utilities; (6) road widening activities that require a change or enlargement of the footprint of the roadway or that extends into previously undisturbed soils; (7) new road construction that would affect soil when the footprint of the roadway extends into previously undisturbed soils; and (8) new road construction that extends into previously undisturbed soils or requires ROW acquisition.
- Final roadway design would avoid known contaminated sites wherever possible. Avoidance may involve adjustments to the roadway design to completely avoid a contaminated site. Minimization may involve adjustments of the proposed roadway alignment to reduce the resultant ROW acquisition.
- Final roadway design may include coordination with the responsible party to ensure that roadway construction does not interfere with ongoing remediation activities.
- Temporary equipment laydown or construction staging areas would be located in previously disturbed (e.g., paved) areas.
- To prevent leaks or spills of contaminants, all temporary equipment laydown or construction staging areas would be constructed with secondary containment for storage of any hazardous or petroleum products.
- To prevent or minimize the potential for contaminants leaching into the soil, the construction contractor shall implement spill prevention and emergency spill response procedures.

With implementation of the above BMPs and SOPs for contaminated sites, impacts from hazardous materials and wastes for Alternative 1 would be less than significant.

18.2.6.2 Alternative 2 (Preferred Alternative)

There are 49 projects that would be constructed as a result of Alternative 2. The effects of potentially contaminated sites to these projects are discussed below.

North

Alternative 2 includes 13 projects in the North Region. The effects of potentially contaminated sites are similar to those for the North Region of Alternative 1.

Central

Alternative 2 includes 27 projects in the Central Region. The effects of potentially contaminated sites are similar to those for the Central Region of Alternative 1.

Apra Harbor

Alternative 2 includes five projects in the Apra Harbor Region. The effects of potentially contaminated sites are similar to those for the Apra Harbor Region of Alternative 1.

South

Alternative 2 includes four projects in the South Region. The effects of potentially contaminated sites are similar to those for the South Region of Alternative 1.

BMPs and SOPs

Potentially contaminated sites that would be associated with Alternative 2 are the same as those listed for Alternative 1. BMPs and SOPs used to avoid or minimize the impact of potentially contaminated sites would be similar to those identified for Alternative 1.

18.2.6.3 Alternative 3

There are 51 projects in Alternative 3. The effects of potentially contaminated sites to these projects are discussed below.

North

Alternative 3 includes 12 projects in the North Region. The effects of potentially contaminated sites are similar to those for the North Region of Alternative 1.

Central

Alternative 3 includes 30 projects in the Central Region. The effects of potentially contaminated sites are similar to those for the Central Region of Alternative 1, with the exception of Site Nos. 64, 65, and 66 that are associated with GRN #20 and 31.

Apra Harbor

Alternative 3 includes five projects in the Apra Harbor Region. The effects of potentially contaminated sites are similar to those for the Apra Harbor Region of Alternative 1.

South

Alternative 3 includes four projects in the South Region. The roadway projects in the South Region are not located in areas where potentially contaminated sites exist or would have influence on the proposed roadway improvements. The effects of potentially contaminated sites are similar to those for the South Region of Alternative 1.

BMPs and SOPs

Potentially contaminated sites that would be associated with Alternative 3 are the same as those listed for Alternative 1. BMPs and SOPs used to avoid or minimize the impact of potentially contaminated sites would be similar to those identified for Alternative 1.

18.2.6.4 Alternative 8

There are 50 projects in Alternative 8. The effects of potentially contaminated sites to these projects are discussed below.

North

Alternative 8 includes 13 projects in the North Region. The effects of potentially contaminated sites are similar to those for the North Region of Alternative 1.

Central

Alternative 8 includes 28 projects in the Central Region. The effects of potentially contaminated sites are similar to those for the Central Region of Alternative 1.

Apra Harbor

Alternative 8 includes five projects in the Apra Harbor Region. The effects of potentially contaminated sites are similar to those for the Apra Harbor Region of Alternative 1.

South

Alternative 8 includes four projects in the South Region. The effects of potentially contaminated sites are similar to those for the South Region of Alternative 1.

BMPs and SOPs

Potentially contaminated sites that would be associated with Alternative 8 are the same as those listed for Alternative 1. BMPs and SOPs used to avoid or minimize the impact of potentially contaminated sites would be similar to those identified for Alternative 1.

18.2.6.5 Summary of Impacts

Table 18.2-10 summarizes the potential impacts of each alternative.

Table 18.2-20. Summary of Potential Hazardous Materials and Waste Impacts-Roadway Project

Potentially Impacted Resource	*Alternative 1*	*Alternative 2**	*Alternative 3*	*Alternative 8*
Leaks and spills of hazardous materials can leach into soils	SI-M	SI-M	SI-M	SI-M
Roadway construction adversely affected by contaminated soil and/or groundwater	SI-M	SI-M	SI-M	SI-M

Legend: SI-M = Significant Impact Mitigable To Less Than Significant. *Preferred Alternative

In summary, the proposed roadway projects could result in increased environmental impacts. These potential impacts could result from increased transportation, handling, use, and disposal of hazardous materials and hazardous wastes. It is expected that the largest increases of hazardous materials would

result from the use of POL/fuels. Expected increases in the use of hazardous waste would include solvents, sealants, paints, degreasers, corrosive or toxic liquids, and aerosols.

Various controls are in place to prevent unintended releases of these substances (see Volume 7). These controls include the following:

- Spill prevention control and countermeasures plans
- Facility response plans
- Waste management plans
- Stormwater pollution prevention plans
- Hazardous material/waste management plans (e.g., asbestos management plans and lead-based management plans, etc.)
- Mandatory personnel hazardous material/waste training
- Waste minimization plans
- Waste labeling, storage, packaging, staging, and transportation procedures
- DoD waste regulations
- Federal and territorial laws and regulations

Despite expected increases in hazardous materials and hazardous wastes, no significant impacts are anticipated as long as the controls discussed above are properly implemented and related plans and procedures updated and modified as appropriate to meet the potential increased demand upon DRMO regarding hazardous substance transportation, handling, storage, use, and disposal.

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