UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
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February 17, 2010

OFFICE OF THE
REGIONAL ADMINISTRATOR

Mr. Roger M. Natsuhara
Acting Assistant Secretary of the Navy
Installations and Environment
1000 Navy Pentagon
Washington, D.C. 20350-1000

Subject: EPA comments on the Draft Environmental Impact Statement (DEIS) for the Guam and CNMI Military Relocation, November 2009

Dear Mr. Natsuhara:

The U.S. Environmental Protection Agency (EPA) has reviewed the above-referenced document pursuant to the National Environmental Policy Act (NEPA), Council on Environmental Quality (CEQ) regulations (40 CFR Parts 1500-1508), and our NEPA review authority under Section 309 of the Clean Air Act. EPA is a cooperating agency on the project EIS and has worked closely with the Department of Defense (DoD) to review and comment on the project since 2007.

Based on our review of the information provided in the DEIS, we have rated the DEIS as Environmentally Unsatisfactory; Inadequate Information (EU-3) (see enclosed "Summary of Rating Definitions"). There are two bases for the "EU" component of the rating: 1) by not providing a specific plan to address the wastewater treatment and water supply needs of the construction workers and induced population growth, the project will result in unsatisfactory impacts to Guam's existing substandard drinking water and wastewater infrastructure which may result in significant adverse public health impacts, and 2) the project will result in unacceptable impacts to 71 acres of high quality coral reef ecosystem in Apra Harbor.

Similarly, there are two reasons for the "3" component of the rating: 1) the DEIS acknowledges that the introduction of 56,000 additional residents (i.e., 23,000 construction workers and 33,000 from induced population growth in peak years) will greatly exacerbate an already environmentally unsatisfactory situation, but it offers no specific, workable plan for addressing this situation; and 2) EPA, and several other involved resource agencies, have determined that the methodology used in the DEIS for evaluating the full extent of impacts to coral reef habitat is not adequate and, as a result, the DEIS does not present an adequate plan for mitigating the unavoidable loss of coral reef habitat.

The military realignment, as proposed in the DEIS, will significantly exacerbate existing substandard environmental conditions on Guam. Presently, Guam's environmental and public health problems exceed those of most U.S. communities. For example, its population experiences boil water notices, sewage spills, exposure to waterborne diseases, and illegal dumping. Indeed, over the last seven years, EPA has issued enforcement orders to the Government of Guam to bring their environmental infrastructure into compliance with federal environmental laws. Further, power production and transportation on the island depends on the highest sulfur content fuel currently used in the U.S.

EPA is concerned about the magnitude of the project impacts, including public health impacts, upon the existing substandard conditions on Guam, further impeding Guam's efforts to comply with federal environmental laws and policies. At the peak of construction, 79,000 new residents (a 45% increase over its current population of 180,000) will relocate to Guam because of the military realignment; however, the DEIS proposes to provide direct services for only 23,000 of that new population. The DEIS acknowledges the impacts to the water and wastewater infrastructure will be significant, but states that these impacts are mitigable to less than significant through upgrades to the local utility. Viable plans for these upgrades are not presented in the DEIS.

As stated in the DEIS, because of Guam's geographic and historical circumstances, Guam "faces two broad types of capacity challenges both of which will affect its ability to cope with the impacts of the proposed action: 1) human resources and 2) financial resources." We do not suggest DoD is responsible for existing conditions on Guam; however, the additional burden placed on existing conditions by the military realignment is the responsibility of DoD. Given the interwoven nature of DoD's impacts on civilian infrastructure in Guam, EPA has consistently advocated for a coordinated approach among federal agencies and the Government of Guam. DoD should provide leadership to articulate and implement a coordinated U.S. Government – Government of Guam funding strategy to address the impacts of the project, including the impacts of the off-island construction and induced population growth.

These impacts are of sufficient magnitude that EPA believes the action should not proceed as proposed and improved analyses are necessary to ensure the information in the EIS is adequate to fully inform decision-makers. Further, EPA believes that the information needed to address the aforementioned inadequacies should be circulated for full public review prior to the issuance of any decision regarding the project. In any event, if we are unable to resolve our concerns in the Final EIS, this matter may be a candidate for referral to the Council on Environmental Quality.

Given the importance of this project and the magnitude of the anticipated impacts, EPA has worked with DoD through the DEIS public comment period to address our environmental concerns about the project as proposed. We appreciate DoD's engagement of EPA and other federal agencies early in the NEPA process and acknowledge that this has resulted in project improvements. We understand the challenges DoD faces in meeting the 2014 deadline for the Marine relocation from Okinawa, and strongly support DoD's stated objective to avoid the creation of "two Guams." Within this context, urgent action is needed and EPA is committed to working with DoD to identifying solutions.

The military realignment to Guam is an historic opportunity to develop a more environmentally, economically, and socially sustainable Guam. EPA strongly supports looking at how the military build-up can advance the goal of "One Guam." DoD has a long-standing policy to take the leadership role within the federal government in helping communities respond to the effects of defense-related activities.[1] This project is the opportunity for DoD, the federal government, and the Government of Guam to "get it right." Moreover, the recently proposed "Tiger Team" trip to Guam to assess priority needs, identify federal funding leveraging opportunities, and identify funding gaps is a positive undertaking. We want to help DoD ensure this effort is outcome oriented and can help achieve interagency cost sharing commitments for immediate, necessary improvements to ensure the long term integrity of Guam's infrastructure systems under the additional burden of the projected population growth associated with this project.

In brief, EPA's primary concerns and recommendations are the following:

Responsibility for Impacts of Construction Workers and Induced Population Growth

The DEIS inappropriately excludes the construction workers and the induced population growth for jobs, and their impacts, as part of DoD's proposed action. We understand DoD plans to use contracting requirements to ensure the service needs are provided for construction workers. However, the DEIS does not specify how these services will be provided for in time to meet demand, resulting in potentially unacceptable environmental impacts. DoD needs to address how the infrastructure needs of the construction workers and the induced population growth will be met.

Drinking Water

According to the DEIS, the military realignment to Guam will result in an immediate island-wide shortfall in water supply. By 2014 this shortfall will range between 6 and 13 million gallons per day. Drinking water shortfalls result in low water pressure, which has direct public health and safety impacts, including increased exposure to water borne diseases from sewage, stormwater infiltration into drinking water, and low water pressure for fire fighting. As the DEIS indicates, these impacts are likely to fall disproportionately upon minority and low-income communities. Eighty-five percent of Guam relies on a federally designated sole source aquifer for drinking water, as does DoD. DoD identifies the local utility, Guam Waterworks Authority (GWA) as the responsible party for providing services to the construction workers and the induced population growth. However, DoD acknowledges the low likelihood of GWA's ability to fund necessary upgrades.

The drinking water shortfall will result in a drawdown of this aquifer with potential long-term impacts, including saltwater intrusion and a reduction in the overall yield of the aquifer. There is uncertainty regarding the sustainable yield of the aquifer, yet DoD has not completed an updated assessment. Provisions for the drinking water demands by the construction workers and the induced population growth are not identified in the DEIS.

[1] Executive Order 12049 – Defense Economic Adjustment Programs.

To ensure the environmental acceptability of this project DoD should complete an interim sustainable yield assessment and long-term comprehensive study, implement an aquifer management plan in conjunction with GWA, and develop a cost-share agreement, including financial and technical assistance to GWA to meet the drinking water needs of the construction workers and the induced population growth.

Wastewater

All of the GWA-operated wastewater treatment plants are operating in non-compliance with their existing Clean Water Act discharge permits. The military realignment to Guam will increase sewage flows to these non-compliant plants. The likely public health result will be an increase in raw sewage spills and human exposure to pathogens through drinking water supply, ocean recreation, and shellfish consumption. Raw sewage spills are already occurring in Guam and have recently increased.

Notably, DoD has identified expansion and upgrade to secondary treatment of GWA's Northern District Wastewater Treatment Plant (NDWWTP) as the preferred alternative to serve both military and civilian populations. EPA strongly supports this approach, however several unresolved issues persist. DoD has not identified how upgrades to the NDWWTP will be funded, and, similar to drinking water, DoD has not identified the impacts or options for providing wastewater service to the construction workers and the induced population growth not serviced by the NDWWTP.

To ensure the environmental acceptability of this project, DoD should identify the reasonably foreseeable wastewater impacts from construction workers and induced population growth beyond those serviced by the NDWWTP and commit to cost-sharing upgrades to the NDWWTP and other treatment plants which will serve the construction and the induced population growth. These commitments should be made prior to the facilities receiving increased sewage flows resulting from the military realignment.

Coral Reefs

The Carrier Vessel Nuclear (CVN) berth in outer Apra Harbor will affect over 71 acres of coral reefs, a magnitude unprecedented for the U.S. Pacific Islands in recent permit history. DoD has used an assessment method which underestimates coral reef impacts and does not provide the data needed to identify appropriate mitigation per the 2008 Army Corps of Engineers (Corps) – EPA Compensatory Mitigation Rule. DoD's inadequate characterization of coral reef impacts and insufficient mitigation proposals are of such serious concern EPA considers the CVN berth project a potential candidate for formal elevation within the context of the necessary Clean Water Act 404 permit. EPA senior political leadership and technical experts are actively participating in a facilitated process with DoD and the other resource and regulatory agencies to resolve these issues and ensure compliance with the Clean Water Act. EPA, the U.S. Fish and Wildlife Service (FWS), and the National Marine Fisheries Service (NMFS) have formally raised these concerns since 2008.

To ensure the environmental acceptability of this project DoD should commit to obtaining coral reef impacts data using the in-situ method recommended by EPA, FWS, and NMFS; and work with EPA, NMFS, FWS and the Corps to identify and assess suitable coral reef mitigation alternatives. Artificial reefs are not a suitable mitigation option.

In addition to these primary concerns, EPA remains concerned about the continued use of high sulfur fuel for power and transportation on Guam and the air quality health impacts from increased project-related emissions. Additionally, DoD needs to demonstrate how the large volumes of waste generated by this project will be managed in the interim and long-term. All of the recommendations above, and in the enclosed detailed comments, should be addressed before the Final EIS (FEIS), and commitments should be included in the FEIS and the Record of Decision.

I will personally be engaged in this issue and look forward to working with DoD and our partnering agencies on next steps to move forward to achieve an environmentally acceptable project consistent with federal environmental law and the Presidential Executive Order on Environmental Justice. Your office can contact Enrique Manzanilla, Director of our Communities and Ecosystems Division. Mr. Manzanilla oversees this project within EPA Region 9 and can be reached at (415) 972-3850 and manzanilla.enrique@epa.gov.

Sincerely,

Jared Blumenfeld
Regional Administrator

Enclosures:
Summary of Rating Definitions
Detailed Comments

cc:
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Gregorio Kilili Camacho Sablan, Congressman, CNMI
Felix Camacho, Governor, Guam
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SUMMARY OF EPA RATING DEFINITIONS*

This rating system was developed as a means to summarize the U.S. Environmental Protection Agency's (EPA) level of concern with a proposed action. The ratings are a combination of alphabetical categories for evaluation of the environmental impacts of the proposal and numerical categories for evaluation of the adequacy of the Environmental Impact Statement (EIS).

ENVIRONMENTAL IMPACT OF THE ACTION

"LO" (Lack of Objections)

The EPA review has not identified any potential environmental impacts requiring substantive changes to the proposal. The review may have disclosed opportunities for application of mitigation measures that could be accomplished with no more than minor changes to the proposal.

"EC" (Environmental Concerns)

The EPA review has identified environmental impacts that should be avoided in order to fully protect the environment. Corrective measures may require changes to the preferred alternative or application of mitigation measures that can reduce the environmental impact. EPA would like to work with the lead agency to reduce these impacts.

"EO" (Environmental Objections)

The EPA review has identified significant environmental impacts that should be avoided in order to provide adequate protection for the environment. Corrective measures may require substantial changes to the preferred alternative or consideration of some other project alternative (including the no action alternative or a new alternative). EPA intends to work with the lead agency to reduce these impacts.

"EU" (Environmentally Unsatisfactory)

The EPA review has identified adverse environmental impacts that are of sufficient magnitude that they are unsatisfactory from the standpoint of public health or welfare or environmental quality. EPA intends to work with the lead agency to reduce these impacts. If the potentially unsatisfactory impacts are not corrected at the final EIS stage, this proposal will be recommended for referral to the Council on Environmental Quality (CEQ).

ADEQUACY OF THE IMPACT STATEMENT

Category "1" (Adequate)

EPA believes the draft EIS adequately sets forth the environmental impact(s) of the preferred alternative and those of the alternatives reasonably available to the project or action. No further analysis or data collection is necessary, but the reviewer may suggest the addition of clarifying language or information.

Category "2" (Insufficient Information)

The draft EIS does not contain sufficient information for EPA to fully assess environmental impacts that should be avoided in order to fully protect the environment, or the EPA reviewer has identified new reasonably available alternatives that are within the spectrum of alternatives analyzed in the draft EIS, which could reduce the environmental impacts of the action. The identified additional information, data, analyses, or discussion should be included in the final EIS.

Category "3" (Inadequate)

EPA does not believe that the draft EIS adequately assesses potentially significant environmental impacts of the action, or the EPA reviewer has identified new, reasonably available alternatives that are outside of the spectrum of alternatives analyzed in the draft EIS, which should be analyzed in order to reduce the potentially significant environmental impacts. EPA believes that the identified additional information, data, analyses, or discussions are of such a magnitude that they should have full public review at a draft stage. EPA does not believe that the draft EIS is adequate for the purposes of the NEPA and/or Section 309 review, and thus should be formally revised and made available for public comment in a supplemental or revised draft EIS. On the basis of the potential significant impacts involved, this proposal could be a candidate for referral to the CEQ.

*From EPA Manual 1640, Policy and Procedures for the Review of Federal Actions Impacting the Environment.

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I. WATER RESOURCES

A. DRINKING WATER - SUPPLY, INFRASTRUCTURE, AND QUALITY

1. Significant Impacts to Public Water Supply

The DEIS projects an unacceptable island-wide shortfall in water supply for 2010 through 2015 due to rapid population growth during the construction phase of the project. This population growth, which includes construction workers and induced growth, will peak in 2014 with an estimated 79,184 additional people, most located off-base and served by the Guam Waterworks Authority's (GWA) drinking water system. Since this impact falls outside the military "fence line", drinking water infrastructure improvements are not included as part of the proposed project, even though the construction workforce is necessary for implementing the project. Instead, the Department of Defense (DoD) places the burden of addressing this shortfall on GWA and the construction contractors. This project-related population increase will significantly affect the ability of GWA to provide sufficient quantity and adequate quality of drinking water for the general population of Guam. This significant impact to drinking water infrastructure has potentially serious and unacceptable public health implications[1], which would fall disproportionately on a low income medically underserved population (Vol. 6, p. 3-48, Vol. 2, p. 18-4).

The water supply shortfall predicted is substantial. The DEIS projects that the shortfall in water supply from GWA will begin in 2010 with the largest anticipated shortfall of at least 6.1 million gallons per day (mgd) occurring in 2014. This shortfall will occur even with GWA's planned expansion of 7 mgd through the installation of 16 new wells. If GWAs expansion does not occur, the shortfall could be as high as 13.1 mgd in 2014. This higher shortfall appears probable, since GWA does not have the financial resources to drill new wells in time to meet the rapidly increasing demand (Vol. 6, p. 3-49). As the project is currently envisioned, DoD does not have the authority to compel GWA to either install additional wells to address the shortfall or to accept water transferred from DoD for delivery to the construction contractors.

Despite this dire situation, the DEIS concludes that impacts to the GWA potable water system would be significant but mitigable to less than significant (Vol. 6 p. 3-54). For potential mitigation, the DEIS suggests there could possibly be 3 mgd of water from DoD's water system that, if requested, could be transferred to assist GWA with its water needs in northern Guam, assuming the necessary piping is installed by GWA or the developer (Vol. 6, p. 3-49, 3-

[1] The DEIS acknowledges: "If this shortfall occurs, it is possible that water outages or low pressure conditions would take place within the water system. Water outages or low water pressure can result in microbiological and other contaminants entering the distribution system, potentially resulting in illness. Water outages or low water pressure can also prevent effective fire fighting and degrade the basic sanitary needs of the population" (Vol 6., p. 3-46)

51; Vol. 7 p. 2-42). However significant obstacles to this possibility are identified[2], such that it cannot be considered a reliable mitigation proposal. The other potential mitigation identified is to undertake adaptive management by adjusting the construction tempo. This mitigation proposal is not sufficiently developed to be considered a reliable mitigation measure (see comment below under adaptive management).

> *Recommendations*: DoD should amend the project description to include all utility upgrades associated with construction of the project and resulting induced growth. If DoD arranges for a third party (such as a utility) to implement a part of the action, specific agreements should be made between DoD and the third party defining their respective responsibilities for financing the complete action. These agreements should be included or referenced in the FEIS.
>
> DoD, in cooperation with GovGuam, must be directly responsible for ensuring sufficient water supply is available to Guam during the construction phase. Specific needs include, but are not limited to, a DoD commitment to provide financial resources and technical support to address the water shortage and the inadequate drinking water infrastructure for contractor and other civilian population growth due to the military expansion. Action on the DoD commitment should start immediately, as the increase in water demand will begin as soon as construction workers and other populations supporting the military expansion arrive. This support would include the identification, planning, design, and implementation of needed capital improvement projects (CIPs) to address the water shortfall and provision of financial and technical assistance for the siting, design, construction, and operation and maintenance of the water supply and distribution system. Infrastructure needs include new wells and other associated water system facilities such as water lines, booster pumps, storage tanks, and treatment facilities. DoD should provide clear, documented commitments (e.g., through a memorandum of agreement or other mechanism) to provide specific quantities of DoD owned water to address construction related shortfalls in supply. DoD should provide financial, engineering, and/or other technical assistance to GWA for implementing effective unaccounted for water[3] (UFW) measures, such as leak detection, water line replacement, and development and implementation of an effective water efficiency and conservation program.

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[2] Obstacles to this mitigation measure include: (1) The lack of interconnections points between the former Anderson Air Force Base (AAFB) water system and the Navy island-wide system may increase the effective distance between the GWA water system requiring additional water and the DoD water resource; (2) Poor condition of certain DoD water mains that may require line segment replacement to interconnect; (3) Repair and maintenance of wells would periodically reduce DoD water supplies, (4) Droughts would reduce the capacity of DoD water production capacity, and (5) Unforeseen increases in future DoD water demands that would reduce the excess water supply available to GWA (Vol 6, p. 3-51 to 3-52)

[3] Unaccounted for Water (UFW) is generally defined as the difference between water produced (supply) and water used (demand) by the ultimate consumers. UFW represents water loss between production and billing (or final authorized end use when water use is not charged or billed, which may be the case on military systems).

For long-term water management on Guam, workgroups or other cooperative entities should be formed, in cooperation with GovGuam. This joint military/GovGuam water management authority should be initiated and supported by DoD[4] to develop a long term drinking water management system, and Northern Guam Lens Aquifer (NGLA) management strategy, and provide the means to reassess conditions of the NGLA at regular timeframes. See also comments under NGLA below.

2. Impacts of Increased Water Demand to the Navy Island-wide and GWA Systems

As the Navy island-wide and GWA water systems are and would continue to be interconnected, the demand in one service area has direct and indirect impacts on the others by potentially reducing the amount of water available for transfer. Currently the GWA Central water system and the Navy island-wide system are connected; the GWA Central system is primarily supplied by the Navy island-wide system. The DEIS identifies plans to provide new connections between the Anderson Air Force Base (AFB) system and the GWA system to allow transfers, as needed, to respond to temporary increased demand, to supplement water shortages during drought, and to stave off impacts of saltwater intrusion in the NGLA. As a result of these transfers, contrary to statements made in the DEIS, demands resulting from the build-up (such as the CVN crew), have the potential to affect the NGLA, even if the crew is supplied primarily from the Navy surface water supply (Vol. 4, Chap. 2, p. 2-39).

Recommendation: The FEIS should include information to reflect the interconnectedness of the water systems since the additional water demand may have the potential to indirectly affect the NGLA and directly affect connected water distribution systems. The Environmental Protection Agency (EPA) encourages DoD to maximize interconnectedness of its water systems with GWA where feasible, and continue to work with GWA (and Guam EPA) in planning efforts to optimize the use and management of both the water distribution systems and the water sources (NGLA).

3. Calculation of Project Water Demand/ Optimizing Water Conservation

Using the current *United Facilities Criteria ("UFC") 3-230-19N, Design: Water Supply System* values to design the new water systems would result in DoD over designing the water supply. EPA comments on the early release DEIS suggested that utilizing this DoD guidance document to estimate demand would likely generate higher than expected estimates since project sustainability elements designed to conserve water would significantly reduce demand. The DEIS includes the higher UFC demand estimates, as required[5], but also incorporates sustainability and water conservation into the water demand calculations which produces a reduced demand that is a more realistic estimate of the expected demand, to be used by Guam Waterworks Authority (GWA) for planning purposes. (Vol. 6, p. 2-32).

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[4] The DEIS does identify a potential mitigation, within DoD control, of setting up a joint advisory panel on the NGLA.

[5] UFC-3-230-19N is being updated and will likely reflect the federal mandates that have been issued since the last release of this guidance

We agree with this approach; however, it is not clear if the calculation of water demand, even with a modified UFC calculation that accounts for water conservation efforts, includes all water uses and losses. For example, a footnote in Vol. 6 Table 2.2-1 indicates that the transient population at Apra Harbor was not included in the water demand because this population will be housed on ships (Vol. 6, p. 2-29). Since this population will generate wastewater to be discharged to the Apra Harbor Wastewater Treatment Plant (WWTP) (Vol. 6, p. 2-5), it would seem there would be a need for potable water for the ship. The 7,222 transients would represent a significant water demand.

In addition, the calculation of water loss or UFW is not clear, and this is one of the critical factors needed for calculating overall water quantity needs. UFW typically represents water loss due to leaks in water transmission and distribution lines, overflows at tanks, unmetered, or inaccurately metered connections, and other sources. Typical UFW's for water utilities range from 5-10 percent (low) to 10-20 percent (average) to 20-50 percent or more (high). The higher the UFW, the more water loss is occurring; hence, more water supply is required. GWA's water system has an estimated 50 percent UFW (Vol. 6, p. 3-10).

The DEIS states that the current Navy island-wide public water system (PWS) UFW is estimated at 15 percent, based on a 2005 utility technical study report[6], which is not included in the DEIS. The UFW rate for the Anderson Air Force Base (AAFB) PWS is also assumed to be 15 percent, although no report is referenced. Based on EPA's knowledge, attained through site inspections and discussions with Guam Environmental Protection Agency (GEPA) and water system personnel, of the age, materials, and general condition of many of the existing Navy and AAFB PWS facilities, which include extensive old and deteriorating water transmission and distribution lines, EPA believes this may underestimate the true UFW. Higher UFWs for the existing PWSs would indicate a significant waste of water, and further stress the water supply. It would also mean the impact assessment underestimates the project water demand.

Finally, the calculation of water demand in the DEIS assumes that the existing bases at Anderson AFB and Navy Base Guam would reduce the overall water demand by 16 percent[7] to comply with Executive Order (EO) 13423 (Vol. 6, p. 3-46, Table 3.2-6). The project description does not include water conservation measures for existing bases. Compliance with the EO cannot be assumed without a specific description of planned conservation measures and a commitment to implement the measures to realize the reductions in the project timeframe. Since those reductions are being relied upon in the DEIS, commitments to implement specific measures needed to achieve them on existing bases should be included in Record of Decision (ROD) for this project.

[6] NAVFACPAC Pacific 2005, referred to in the DEIS (Vol 6, Page 2-27)

[7] Table 2.2-3 in Vol 6 p. 3-24 estimates overall potential reductions at Anderson AFB and Navy Base Guam to be 15% and 8% average daily demand for AAFB and Navy respectively, and 30% and 20% for max daily demand respectively.

Recommendations: Since "breakpoint years"[8] are fast approaching (ranging from 2011-2019), it is vital that accurate numbers for water quantity demand be used for the purposes of designing new water system sources. The FEIS should address the points made above, including the potential 255,000 gallons per day required for the CVN[9], and modify the water demand as appropriate. Accurately assessing UFW and developing programs to address UFW should be included in the project and documented in the FEIS. Some of the water loss may be addressed by proposing extensive replacement of the Navy Island-wide Water Transmission Lines.

DoD is uniquely positioned to help GWA reduce its 50 percent UFW issue. As well-documented in the DEIS, Guam's water supply will be challenged during the buildup. Repairing GWA's water system is a long-term project, but could definitely be expedited with assistance from DoD. Investment in repairing GWA's existing system would likely be much more cost effective over time than developing new sources of water as population grows and wells continue to exceed their sustainable production capacity. An upgrade of GWA's water system would be of benefit to all Guam residents, as the military systems would be interconnected with GWA (without risk of losing 50 percent of water produced) and provide long-term water availability.

A larger investment in water supply and water demand conservation for both DoD existing and new water systems is needed. The DEIS discusses the Federal mandates that require use of water conservation technologies and states that measures such as low-flow faucets, toilets, appliances, and wastewater recycling for industrial washing and landscape irrigation would be used "to the extent practical". EPA recommends that these efforts be incorporated to the maximum extent possible and that water systems be designed for the reduced demand. In addition, specific actions on existing bases to achieve the 16 percent reduction, per EO 13423, should be identified, included in the project description, and committed to in the ROD.

The following recommended actions would extend Guam's water supply and ensure the water conservation goals required under EOs 13514 and 13423 are met or exceeded[10].

Water demand conservation:
To reduce short and long-term water demands of the military relocation, strict water ordinances should be developed and implemented for all military bases and be incorporated into contract language for construction worker housing. These ordinances should require:

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[8] Vol. 6, Chapter 2, p. 2-36
[9] Vol. 4, Chap. 2, pp. 2-36 and 2- 39 describe a daily demand of 20,000 gallons to support the nuclear carrier and 235,000 to support a CVN 78 with air wing troops aboard.
[10] Water conservation also eliminates the energy needed to produce, treat, and distribute water, and reduces the associated greenhouse gas emissions to produce that energy.

- Retrofit and/or new installation of WaterSense certified toilets, flushing urinals, faucets, and showerheads[11] at all military facilities. Replacing older toilets and urinals can save between 4,000 and 4,600 gallons of water per unit per year;
- All new homes to be built under military jurisdiction (especially the new Marine Base) to be WaterSense certified (can save 10,000 gallons per home per year);
- High water efficiency, and Energy STAR certified clothes washers in all homes under military jurisdiction;
- Landscaping with native vegetation only, and avoiding lawns that require artificial irrigation except with recycled water and/or captured rain water (outdoor irrigation can account for up to 75 percent of home water use), site design to retain 95 percent of precipitation on site through swales, etc.;
- Water meters on all buildings, and tiered rates that discourage excessive water use. This will also help detect leaks inside buildings. A tiered water rate is critical for homeowners and military units to encourage water conservation. Flat water rates provide no motivation for water users to conserve water;
- Provide outreach that gives tips for water conservation in homes and provides free in-home water audits and leak detection.
- Grey water systems, where applicable, on all new facilities, and existing facilities that generate large volumes of grey water. Wastewater reuse should also be considered as an important water conservation method (see section below on wastewater reuse).

Water supply conservation:

- Verify the UFW for the Navy and Air Force PWS's. EPA recommends using the recognized drinking water industry water loss audit assessment method described in the American Water Works Association (AWWA) standard "*Water Audits and Loss Control Programs, M36*", 2009 revision, which includes a standard methodology (and publicly available software) for performing system-wide public water system water audits. The 2005 utility technical study report (NAVFAC Pacific 2005) referenced in Vol. 6. p. 2-27 should be included as an appendix in the FEIS.
- Based on the results of the water audits, commit to implementing a Water Loss Control (WLC) program for Navy and Air Force PWS's to address the most significant sources of UFW/ water loss, including but not limited to: improving the ability to measure and audit water losses (improved metering and other means); instituting an effective regular leak detection and repair program; pressure management programs; water efficiency, and other measures. See also AWWA publication *"Water Loss Control"*, 2008.

[11] Showerheads to be WaterSense certified in early 2010

- Install leak detection equipment, or conduct annual leak detection surveys, on all existing military water systems. This will help existing water systems meet or exceed the 15 percent unaccounted for water (UFW) described in the DEIS to get closer to the 5 percent UFW target at the new Marine Base, and to exceed the water conservation goal required in EOs 13514 and 13423.
- For the Main Cantonment, install leak detection equipment during new water system construction, dual plumbing for nonpotable water use, and rainwater catchments and gray water systems to reduce water demand and wastewater flow to treatment facilities.

B. Northern Guam Lens Aquifer (NGLA)

1. Hydrologic Impacts, (Recharge, Withdrawal) on Aquifer Not Sufficiently Assessed
The combined effect of the project impacts on the NGLA has not been assessed. For example, there will be impacts on groundwater recharge and stormwater drainage from the installation and pumping of new DoD and GWA wells, and from the significant loss of vegetation[12] and associated increases in impervious surfaces. How these combined effects will impact the NGLA is not predicted. A comprehensive hydrologic model at the sub-basin level is needed to assess the potential impacts from multiple influences on this dynamic system. No model was prepared for the DEIS; instead general statements regarding impacts are made, with conclusions that Best Management Practices (BMPs) will mitigate all impacts to less than significant.

The DEIS notes that DoD has initiated a study to determine the optimal well and well field configurations (the "optimal well study") needed to upgrade and integrate the water systems to meet future water demands, with results to be incorporated in the FEIS. However, this study is focused only on water supply and demand, and does not address the overall management of the aquifer with regard to such factors as increased pumping and chloride levels, large-scale vegetation removal, the effect of increased impervious areas on stormwater drainage patterns and contaminant movement (e.g. microbials), and sustainability of the aquifer.

DoD has also planned a modeling study to be conducted by the U.S. Geological Survey (USGS). We support this USGS study, however, once the study is initiated, it is estimated to take at least 3-5 years to complete, which means results will come too late to be used for effective short term planning[13] or overall water resource management during early phases of the planned military expansion.

> *Recommendation*: DoD should prepare a numerical model as part of the planning process to assess the potential combined impacts to the quality and quantity of groundwater on the NGLA. This model should be prepared as an interim step, and as

[12] The preferred Main Cantonment alternative 2 will result in removal of over 1,600 acres of vegetation, including over 1,300 acres of limestone forest (Vol. 2, p. 10-143). All preferred alternatives will result in over 2,000 acres of vegetation cleared on Guam (Vol. 7, p. 3-27), with almost all occurring over the NGLA.
[13] Including what would be needed for an adaptive management approach to mitigation - see comment under Adaptive Management

soon as possible, to account for demands on the aquifer during the construction phase and for the overall project life-cycle water supply demands and conditions. At a minimum, the model should account for the impacts at the sub-basin level of increased impervious areas, changes in drainage patterns, the additional planned wells, potential effects from climate change, and the effects of pumping on the known contaminant plumes and other potential contaminants, such as at Andersen AFB. Assumptions used in developing the interim hydrologic model should be clearly outlined, as well as any model uncertainties. We note that should an adaptive management strategy for mitigation be pursued, evaluations related to slowing the construction tempo would be assisted by a comprehensive hydrologic model.

DoD should also fund and commence the USGS study. As noted above, DoD should commit to creating a joint military/GovGuam NGLA management authority with one of its primary missions being to develop a long term management strategy and to provide the means to reassess conditions of the NGLA at regular timeframes.

2. Sustainable Yield Estimates

There is uncertainty regarding the sustainable yield of the NGLA, and DoD has not completed an updated assessment. Rather, DoD is relying on an administrative review of a 1992 study that estimated the sustainable yield of the NGLA at 80.5 mgd. The 1992 study itself stated that “the estimated sustainable yield of the systems should be revised continually in light of data obtained from ongoing well development and monitoring” and the recent administrative review performed by DoD concurred with this statement. The FEIS should include an updated estimate of the sustainable yield of the NGLA (at the sub-basin level) to include the 17 subsequent years of collected data until the USGS study commissioned by DoD is completed, in more than three years.

Recommendation: Protection of the NGLA, a federally designated sole source aquifer is imperative, thus the sustainable yield estimates for the NGLA should be updated to include data collected since the 1992 Mink Report was prepared, and this information should be incorporated into the FEIS and other planning documents.

3. Protection of Water Quality of the Northern Guam Lens Aquifer

The proposed actions include many threats to the NGLA, and without sufficient detail regarding these threats, it is not possible to determine whether this valuable resource will be adequately protected from contamination during and after the build-up. The NGLA is a designated "Sole Source Aquifer" under the Federal Safe Drinking Water Act (SDWA) and is a sensitive and irreplaceable source of drinking water for the communities overlying it. The information identified in our recommendations below is vital to both assess impacts and ensure protection of the aquifer.

The DEIS acknowledges that the NGLA is vulnerable to contamination from bacteria, nutrients, chlorides, and toxic contaminants (Vol. 2, p. 4-27), but the assessment consists of a statement that new and potential contaminant sources will not exceed federal and local requirements, and relies on a range of generic BMPs and LID (Low Impact Development) concepts to address potential impacts. A site-specific LID study and a comprehensive drainage study for the Main Cantonment site at Finegayan are being prepared to determine stormwater runoff quantities and qualities under the action alternatives (Vol. 7, p. 2-19). The DEIS states these studies and EPA's BMP Performance Tool will be used to identify and implement an "LID plan" to provide the foundation for the design for permanent stormwater infrastructure. The DEIS does not explain why the comprehensive drainage study is limited to the Main Cantonment site at Finegayan, how the LID plan will be used to determine site-specific BMPs and LID measures, nor how these measures would prevent impacts to the NGLA under various build out scenarios. For example, the DEIS provides descriptions of generic BMPs (Vol. 7, Table 2.1-1), but there is no indication which BMPs are intended to address contaminants, such as microbials, that could infiltrate through the thin soil cover and impact the NGLA, nor is there discussion of the effectiveness of such BMPs, especially in karst environments. It is unclear whether the LID and other studies will be included in the FEIS.

The changes to the landscape that the project proposes could affect the underlying geology in the build out areas to render the NGLA more vulnerable to contamination. Paving of existing recharge areas, loss of vegetation, and possible rerouting of stormwater could induce changes to groundwater flow patterns that create or expand conduits (e.g., sinkholes) for contaminants to reach the NGLA. The DEIS states that a site-specific geotechnical investigation was not carried out for areas other than Naval Computer and Telecommunications Station (NCTS) Finegayan (Vol. 2, p. 3-29). Over 1,200 sinkholes exist on Guam, but only seven major sinkholes are identified on Figure 3.1-3 (Vol. 2, p. 3-6). It is not clear how these sinkholes may be affected by the build out.

While the DEIS provides a cursory review of well-siting constraints (Vol. 6, pp. 2-48 and 2-49) and potential contaminant impacts (Vol. 6, p. 2-50), the level of detail is inadequate to determine if current and potential wells will be adequately protected from potential contaminant sources. The DEIS also lacks, in any substantive form, a summary or discussion of available groundwater quality monitoring data for the NGLA, especially in regions with current or proposed well sites.

Recommendations: The following additional information should be included in the FEIS:

- More details (e.g., data on stormwater quality and demonstrated BMP performance) supporting the position that the combination of BMPs and/or LID concepts will adequately protect the NGLA during and after construction.
- Identification of the BMPs intended to protect the NGLA, and a technical description of their potential effectiveness at reducing the expected leachable contaminants that may be encountered because of the build out.
- Results of a drainage study, which should be completed for all the proposed project areas, not just for Finegayan.
- Results of the LID study and comprehensive drainage studies, if they are completed; if not, the FEIS should clearly state when those studies will be

completed. Explain how the LID plan will be used to determine site-specific BMPs and LID measures.

- If dry wells are planned as part of the build-up, their siting and design can provide a direct conduit to the NGLA. Discuss the relationship between any dry wells, new water supply wells, and potential contaminant sources.

- A map of all sinkholes and caves in the project areas to ensure that adequate measures will be taken to prevent infiltration of contaminated stormwater via a sinkhole or other conduit to the NGLA. Clearly state the intention to mimic and not alter existing drainage patterns, whether the build-up will affect any sinkholes, and whether there is any intent to use the sinkholes for stormwater management.

- Discussion and tabular summary of, and reference to, all available groundwater quality data. The Installation Restoration Program at Anderson AFB (in 36 CES/CEVN, Unit 14007) maintains an extensive groundwater monitoring program. Include a summary of these and other relevant groundwater quality data (e.g., at WERI and USGS) for areas with current or proposed wells.

- Comprehensive map(s) allowing the reader to see the location of current and proposed wells, proposed project footprints, groundwater flow patterns, Areas of Concern sites, Installation Restoration Program sites, known contaminant plumes (e.g., National Priorities List sites), pump/lift stations for wastewater transmission, and other potential contaminant sources, etc. Figure 2.2-2 (Vol. 6, p. 2-49) in the DEIS does provide some useful information, but it should be divided into a series of maps to allow greater detail and additional information.

- A commitment by DoD, given the vulnerability of the NGLA, to complete a Source Water Assessment[14] (SWA) for each current and planned well. The SWAs should include a map depicting well locations with known and anticipated contaminant threats (e.g., chemical storage, petroleum storage, service stations, chemical plumes, pump stations/sewage conveyance systems, areas on septic systems, etc.) Each SWA should identify contaminant risks located within a two-, five-, and ten-year time-of-travel from each wellhead.

C. Groundwater Under the Direct Influence of Surface Water (GWUDI)
The DEIS does not adequately describe and address the regulatory requirements, and resulting construction and operations impacts, from anticipated GEPA designations of existing and future drinking water wells as either groundwater, or groundwater under the direct influence of surface water (GWUDI).

Recommendations: To avoid the need for additional treatment, wells should be sited away from significant sources of fecal and other contamination sources. Source Water

[14] The SDWA requires all states to complete Source Water Assessments (SWAs) for their Public Water Systems. Additional information regarding source water assessments can be found at: http://cfpub.epa.gov/safewater/sourcewater/sourcewater.cfm?action=Assessments

Assessment data may be useful for this. In addition, we recommend the following information be included in the FEIS:

- An expanded discussion of GWUDI and the NGLA (Vol. 2, p. 4-10) to address the understood issues of fecal contamination from sewage spills and lift station failures.
- An expanded discussion of the treatment that may be necessary for those wells that are determined to be GWUDI. The DEIS lists only disinfection and fluoridation at well heads for water treatment (Vol. 6, p. 2-45, Table 2.2-10, *Basic Alternative 1 – Proposed Water System Components).*
- Identification of all the regulatory requirements that will apply should the groundwater be classified as GWUDI by GEPA, to be added to the discussion on federal drinking water regulations in Vol. 2, Chapter 4. These requirements include: Surface Water Treatment Rule (SWTR), Interim Enhanced SWTR, Long-term 1 Enhanced SWTR, Long-term 2 Enhanced SWTR and any other associated requirements.
- A table of treatment requirements and options for classifications of wells as groundwater, disinfected groundwater, GWUDI with filtration avoidance, and GWUDI requiring filtration, and the environmental impacts from these.

D. Surface Water Protection - Fena Reservoir

Increased activities within the Naval Munitions Site (NMS) may increase loading of sediment and contaminants bound to sediments to the Fena Reservoir, resulting in water quality degradation. The DEIS describes sedimentation and phosphorus problems in the reservoir, the main surface water supply for the DoD Navy island-wide water system and GWA Central Guam water system. The entire Fena Reservoir watershed consists of moderately to steeply sloped lands, with a soil type that contributes to rapid runoff rates and significant erosion, particularly in areas where the native vegetation has been removed. Soil erosion transported to the reservoir by stormwater runoff contributes to reduced reservoir capacity and increased phosphorus loading (Vol. 2, p. 4-60). Sediment influx into the reservoir has reached levels that have prompted the Navy to contract with the Division of Forestry, Guam Department of Agriculture to reforest portions of the watershed that drain into the reservoir. In addition, the DEIS indicates the Fena Reservoir is experiencing periods of low dissolved oxygen and increasing eutrophication.

The Mariana Islands Range Complex (MIRC) DEIS indicated that some of the munitions contaminants, specifically manganese and zinc, were migrating from the Navy detonation site to Fena Reservoir. The concentrations were below EPA Region 9's Preliminary Remediation Goals (PRGs). However, with the Guam build-up and additional training taking place in the same Fena watershed as the MIRC actions, the cumulative impacts should be considered and described in the FEIS.

Proposed training activities on Guam would also include the use of explosives. As a result of such activities, the following potential surface water quality impacts may occur: contamination of surface drainage areas from runoff; contaminant accumulation in waters from leaks or spills of petroleum, oil, and lubricants (POLs) and hazardous materials; situation and formation of sediment plumes; and heavy metal and hazardous materials leaching from munitions and explosives of concern (MEC).

> *Recommendation*: The FEIS should assess the cumulative water quality impacts of activities occurring in the Fena Reservoir watershed. A SWA should be completed for the Fena Reservoir, and a stormwater pollution prevention plan (SWPPP) or watershed protection plan should be developed and implemented with BMPs to prevent further soil erosion, sediment and pollutant contributions to the Reservoir.

E. Water and Wastewater Utility Asset Management and Energy Efficiency
Opportunities to save energy during water and wastewater treatment plant construction and operation should be considered. Preferred alternatives in the DEIS include expanding and upgrading the Northern District Waste Water Treatment Plant (NDWWTP) to primary and secondary treatment levels and/or building a new secondary plant near proposed development on DoD land. Implementation of energy-saving opportunities at these and other water and wastewater facilities will reduce operational costs and allow capital improvements to be made in accordance with asset management programs.

> *Recommendations*: DoD should consider working with GWA to conduct energy and water audits of all water and wastewater system designs (especially for the NDWWTP and Hagatna renovations) and at existing facilities (including utility buildings, and collection and distribution systems). Use the audits to identify energy, water, and cost-saving opportunities (e.g. pipe replacement and efficiency improvements for pumps, motors, aeration systems, reducing friction, optimizing energy efficiency of existing processes, etc.). The benefits of these audits should be discussed in the FEIS and DoD should commit to implementing audit recommendations prior to design of new facilities.
>
> Commit in the FEIS to develop and implement energy management programs at all military water and wastewater utilities. EPA's Energy Management Guidebook[15] for Water and Wastewater Utilities provides a detailed approach for implementing energy management systems based on the Environmental Management System (EMS) approach. Implementation of energy management systems at water and wastewater utilities can reduce operating costs by up to one-third.

F. Drinking Water Security
As the project will significantly increase the military presence on Guam, water security issues should be addressed for facilities on base. DoD should include standard water industry security provisions for its drinking water systems, including designing new (or retrofitting existing) system components to enhance security; performing vulnerability assessments; and developing and maintaining drinking water emergency response plans. DoD should consider this process

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[15] The guidebook can be downloaded at:
http://www.epa.gov/waterinfrastructure/pdfs/guidebook_si_energymanagement.pdf

essential to maintaining the security and reliability of its drinking water system and island-wide water supply.

> *Recommendations:* DoD should consider using the Water Infrastructure Security Enhancements (WISE) program developed by the American Society of Civil Engineers (ASCE), the American Water Works Association (AWWA), and the Water Environment Federation (WEF). The WISE program contains the *Guidelines for the Physical Security of Water Utilities* which describe physical security approaches to protecting drinking water facilities, and would be most useful to DoD in the design and planning phase for the expansion of the existing water system.
>
> DoD facilities should address the assessment areas established by the Public Health Security and Bioterrorism Preparedness and Response Act of 2002. The Safe Drinking Water Act (SDWA), Section 1433, requires all community water systems serving a population greater than 3,300 persons to conduct a Vulnerability Assessment (VA) and revise their Emergency Response Plans (ERP) to reflect the findings of the VA. An assessment should include the following components: (1) a review of pipes and constructed conveyances; (2) physical barriers; (3) water collection, pretreatment, treatment, storage and distribution facilities; (4) electronic, computer or other automated systems used by the public water system; (5) the use, storage, or handling of various chemicals; and (6) the operation and maintenance of the system.
>
> DoD should develop or revise its drinking water ERP following all DoD requirements, including the guidance found in DoD Instruction 2000.18, *Department of Defense Installation Chemical, Biological, Radiological, Nuclear and High-Yield Explosive Emergency Response Guidelines* dated December 4, 2002 and other applicable requirements and guidance.

G. Additional Requirements that apply to the NGLA and Public Water Systems

The DEIS does not include a complete characterization, description and listing of all the federal and Guam Drinking Water / Public Water Supply (PWS) System Regulatory Requirements that apply to the existing and proposed PWSs. EPA is mandated to review certain federally funded projects for potential impacts to the NGLA in accordance with Section 1424(e) of the SDWA, and has a specific role in coordinating with other federal agencies to review federal financial assistance projects which may impact the NGLA. The FEIS should acknowledge this role and mandate.

> *Recommendations:* The FEIS should include the following:
>
> - EPA's role in reviewing the off-base roadway projects in coordination with the Federal Highways Administration (FHWA) for potential impacts to the NGLA in accordance with Section 1424(e) of the SDWA, and its role in coordinating with other federal agencies to review federal financial assistance projects that may impact the NGLA.

- In addition to the Federal SDWA cited in Sect. 3.1.1, the National Primary Drinking Water Regulations found at 40 CFR 141 should be cited.
- In addition to the Guam SDWA cited in Sect. 3.1.1, the Guam Safe Drinking Water primary drinking water regulations should be included. These regulations are found at: 22 GAC – Guam EPA Division II – Water Control Drinking Water Chapter 6 PART 6141 – Guam Primary Drinking Water Regulations.
- The FEIS should include more discussion of the regulatory and cost impacts of GWUDI determinations on the PWS with respect to design, permitting, construction and GEPA regulatory oversight.

H. Tinian Water Resources

1. Impacts to Groundwater on Tinian

The DEIS does not provide adequate information on well locations and groundwater flow patterns to determine if the build out activities (i.e., firing ranges) on Tinian will impact underground sources of drinking water (USDWs). Munitions and explosives of concern (MECs) can have negative long-term impacts on groundwater quality, and the DEIS does not demonstrate that the MECs used at the firing ranges will not contaminate the aquifer and critical wellheads (i.e., those located in or near the Makpo wetland area) supplying drinking water on Tinian. The DEIS states that approximately 40 drinking water wells were drilled on Tinian, but most have been abandoned (Vol. 3, p 4-5). As abandoned wells can act as conduits by which pollutants could reach the aquifer, the FEIS should explain where they are located and whether MECs pose a potential threat to groundwater.

> *Recommendations*: The FEIS should address the following: (1) clearly describe the groundwater resources at Tinian; (2) provide a map of the groundwater flow patterns; (3) describe and depict any subbasins and/or groundwater flow boundaries on Tinian; (4) describe how the firing range activities (e.g., MECs) will affect the underlying groundwater; (5) describe whether the groundwater underlying the firing ranges is a potential USDW; and (6) discuss whether abandoned wells have been properly destroyed and specify the locations of any that exist within the project area.

2. Tinian Wastewater Treatment - Pre-Existing Leachfield

The DEIS does not provide adequate information (e.g., data) to determine whether the septic tank and leachfield (septic system) can safely and legally provide for disposal of the proposed sewage collected in port-a-potties. For example, the DEIS does not indicate the anticipated amount or frequency of the loadings, whether the system was designed for the proposed use, and whether the system is currently operational and maintained.

Large capacity septic systems are subject to the Underground Injection Control (UIC) regulations. The Commonwealth of the Northern Mariana Islands (CNMI) Department of Environmental Quality (DEQ) locally implements the UIC regulations and its own onsite wastewater disposal regulations.

The FEIS should assess how additives, such as paradichlorobenzene, that are typically used in commercial portable toilets to deodorize sewage and/or liquefy solids by destroying microbiological activity could impact water quality. If there is no microbiological activity in the sewage disposed to the system, there is a greater likelihood of leachfield failure, surfacing effluent and resultant public health risk by exposure to untreated sewage. While there may be no public water supply wells in the immediate area, there may be agricultural or other non-public supply wells in the area that could be affected. The DEIS does not provide a map showing the location of the leachfield in relationship to existing and/or abandoned wells.

> *Recommendations*: CNMI DEQ should be consulted to determine applicable permit requirements. The FEIS should discuss permit requirements associated with the leachfield and its proposed use.
>
> The leachfield should be evaluated for its construction and design flow capacity in the context of the proposed use, and if it is not already equipped with adequate primary treatment tanks, they should be added according to CNMI onsite wastewater regulatory specifications. The findings of the evaluation should be discussed in the FEIS.
>
> If paradichlorobenzene or other chemical deodorizers are to be used in the toilets, the primary treatment tanks should be oversized to allow recovery of the organisms needed to treat sewage. Spill response plans should not include disposal to the Casino Wastewater Treatment Plant without careful consideration of the proportion of chemical additive to the Plant's primary treatment unit volume and detention time. DoD may wish to consider other forms of pretreatment such as composting toilets.
>
> EPA recommends an operation and maintenance schedule for any remote onsite sewage system to ensure that it continues functioning as designed, and that backflows are reported and addressed promptly.
>
> The FEIS should discuss well (e.g., public supply, agricultural, or monitoring) locations downgradient and in the vicinity of the leachfield, and the potential for impacts on the aquifer and wells.

I. WASTEWATER

1. Interim Wastewater Infrastructure Needs (Construction Workers and Induced Growth)
The surge in the population caused by the temporary construction workforce and supporting civilian population would stress the island's already overburdened wastewater infrastructure to unacceptable levels, yet the wastewater infrastructure improvements necessary to accommodate these populations, which are needed for the project's construction, are not included in the proposed project description. Instead, DoD expects GWA to absorb this treatment burden.

Adding flows to any of GWA's existing wastewater treatment systems will exacerbate an already significant water quality problem caused by inadequate treatment of sewage, and increase the potential human health and environmental risk associated with those facilities operating in noncompliance. All Guam facilities are currently operating out of compliance with their Clean Water Act (CWA) permits, and GWA is operating under a court enforced stipulated order. Lack of GWA resources, due in particular to restrictions on fees that can be collected from the public for sewer services, have severely limited GWA's ability to adequately maintain and update its wastewater treatment system. As a result, GWA has experienced frequent violations of its NPDES permit requirements, including inability to adequately treat wastewater and exceedances of the allowed pollutant levels in plant discharges. The DEIS references EPA's assessment that both the Hagatna WWTP and Northern District WWTP (NDWWTP) had failed to meet minimum standards for primary treatment, including adequate removal of pollutants, compliance with pollutant discharge permit limits, and ability to demonstrate that plant discharges are not affecting water quality or the environment (Vol. 6, p. 3-15).

EPA considers it unacceptable that DoD places the burden of addressing project-related increases in wastewater on GWA and the construction contractors. The DEIS identifies measures GWA or GovGuam could implement, such as charging development impact fees, and assessing system development charges to contractors. However, increased water and wastewater user fees/charges are insufficient to support the upgrades and repairs needed for the existing water and wastewater infrastructure. Given the financial and resource constraints that exist for Guam, it is unrealistic to propose that GWA can accommodate the direct and indirect impacts of the increased contractor population to support the military expansion. (See comment below regarding GWA's financial capacity).

The wastewater flows from the peak construction period of 2014 would exceed the physical capacity of the NDWWTP (12.8 mgd, which is greater than the design capacity of 12 mgd) (Vol. 6, p. 3-56). The DEIS states that GWA could add chemical coagulants or increase the surface overflow rate (within the normal design range) of the clarifier to improve plant operations to treat the 0.8 mgd in excess of the plant's physical capacity, without adverse effects on the NDWWTP (Vol. 6, p. 3-56, 19-7). There is no technical discussion or reference to technical reports to support this assertion.

To mitigate impacts from increased flows to NDWWTP during the construction phase, DoD would arrange for wastewater to flow to plants other than NDWWTP, by working with GovGuam to divert induced civilian and construction worker housing to other areas, utilizing tanker trucks to ship excess wastewater from the NDWWTP to other treatment facilities on Guam, or requiring construction contractors to use a cruise ship or hotel barge docked at a commercial pier to be used as housing instead of areas that feed wastewater to NDWWTP (Vol. 7, p. 2-49). None of these measures are reasonable, since all of GWA's WWTPs and the Navy's existing Apra Harbor WWTP are in non-compliance with their current NPDES permits. Use of a different WWTP would reduce demand on the NDWWTP but would result in transferring impacts to another WWTP, whose impacts would need to be mitigated. Depending on where construction workforce housing is located, it may be necessary to ban any new connections, pending resolution of the compliance issues.

In addition, the impacts to GWA's wastewater collection and conveyance system from new workforce housing could be significant. The DEIS provides a list of potential areas where the construction workforce could be housed but states that siting work force housing is out of DoD's control. Timely completion of wastewater collection, conveyance, and disposal improvements is difficult under this scenario, and apart from the time needed to design and construct the needed infrastructure, permitting of construction workforce housing could take up to a year to be approved by GovGuam agencies.

> *Recommendation*: DoD should commit to an appropriate cost share to upgrade and expand Guam's NDWWTP, which would receive the majority of the increased military and civilian sewage flows, and other wastewater treatment plants that would be affected (See comment below regarding Hagatna WWTP), prior to the facilities receiving increased sewage flows as a result of the military expansion. DoD should also commit to an appropriate cost share for the plant to upgrade to secondary treatment, if required[16]. All mitigation measures identified in the FEIS should be reasonable and not simply transfer impacts to other locations. See also our comments under "Adaptive Management" and regarding Hagatna WWTP.
>
> The FEIS should cite technical references that support the conclusion that the primary clarifier would be able to treat the additional 0.8 mgd in excess of the plant's physical capacity, without adverse effects on the NDWWTP.
>
> The construction workforce housing areas need to be more specifically identified in order to determine direct and indirect impacts to GWA's infrastructure so that proper mitigation measures can be identified in the FEIS and implemented as part of the project.
>
> The FEIS should delete the reference in Vol. 6, p. 3-18 to an Administrative Order that would be issued by EPA outlining specific requirements to bring the NDWWTP to primary and secondary treatment standards.

2. GWA Wastewater System - Financial Capacity

The DEIS relies upon GWA to finance and execute major capital improvement projects to upgrade its wastewater infrastructure. The DEIS does not evaluate GWA's financial capacity and rate payer's ability to pay its other water and wastewater needs, which total approximately $900M, plus costs for upgrading the NDWWTP to full secondary treatment (estimated at approximately $200M).

The DEIS does identify resources to assist GWA in funding increases in wastewater flows, and puts the financial burden on GWA and GovGuam. GWA estimates the cost of expanding its

[16] If required by the Environmental Appeals Board (EAB) in response to appeal of EPA's denial of a secondary treatment variance under CWA 301(h).

system to accommodate the military buildup induced population to be $200M (Vol. 6, p. 3-19). The DEIS states these improvements will be financed through GWA's surplus system revenues, grants, and loans, and that the Navy would coordinate with GWA to expedite the planned CIP so that the NDWWTP would have sufficient interim capacity until the final long-term wastewater solution. As GWA has indicated it does not possess the financial resources to drill new wells to meet short-term water demands (Vol. 6, p. 3-49), it will also need additional financial resources to make improvements to its northern treatment, collection, conveyance, and disposal system to address wastewater treatment demands from the military buildup.

> *Recommendation*: As recommended above, DoD should commit to an appropriate cost share to upgrade and expand Guam's NDWWTP. DoD must ensure that all aspects of its project, especially the components that will prevent significant environmental impacts, are included in the project description and are funded. Thus, the FEIS needs to further discuss resources available and the steps needed to secure funding to assist GWA in addressing short-term direct and indirect impacts from the military buildup, to avoid an additional financial burden on GWA.

3. Northern District WWTP

a. Discrepancies Regarding Current Flows

The DEIS reports that the current wastewater flow rate to the NDWWTP is 5.73 mgd (Vol. 6, Table 2.3-4). Projecting this flow rate to the peak hourly flow (PHF) by multiplying by 2.25[17] yields a peak hourly flow of 12.89 mgd. These values, however, fall substantially short of the average daily flow of 7.8 mgd and peak wet-weather flow of 18.0 mgd for the same tributary area presented in GWA's 2006 WRMP. The WRMP also indicates that the average daily dry-weather flow is 164 gallons per capita per day (gpcpd) rather than the 120 gpcpd used in the DEIS.

Independent in-system flow metering should be performed as soon as possible to determine current wastewater flows and infiltration/inflow (I/I) rates into the existing sanitary sewer system. Hydraulic constraints in the existing sanitary sewer system may also be constricting peak wet weather flow rates. Therefore, the inflow rates of rainfalls of varying intensities will need to be monitored to ensure inflow rates under peak rainfalls can be determined as accurately as possible. In addition, the proposed design flow rates for the NDWWTP (Vol. 6, Section 2.3.3) do not appear to include allowances for dry-weather infiltration and wet-weather inflow into the existing or new sanitary sewers.

> *Recommendation:* The FEIS should resolve discrepancies in flow and per capita rates, assess in-stream flow metering to determine accurate wastewater and inflow/infiltration rates, and reassess need for a higher peaking factor.

[17] Vol. 6, p. 2-69 Table 2.3-4 based on a ratio of 2.25 to 1 of peak flow to average flow from the original design calculations of the NDWWTP

b. Assessment of Impacts to Marine Biological Resources, Human Health, and Recreation
The DEIS lacks sufficient information to describe potential impacts to marine biological resources, human health, and recreation from wastewater discharges associated with the proposed project. The following comments point out discrepancies and insufficiencies in the DEIS to be addressed in the FEIS to better understand and disclose the relationship between such discharges and marine biological resources.

The FEIS should present, for analysis, a conservative dilution credit based on conservative assumptions. The DEIS states that the initial dilution factor for the new NDWWTP outfall is 300, despite GWA's use of 200 as the basis of design. The 300 initial dilution factor is based on DoD's draft ocean outfall study (to be completed). Prior to the incorporation of a dilution factor in a future (reissued) NPDES permit based on secondary treatment, a mixing zone allowance would need to be approved by GEPA and US EPA. As the timeframe for approval of such an allowance is unclear, the FEIS should analyze whether the discharge could meet Guam water quality standards without a dilution credit. To this end, Table 13.2-4 in Vol. 6 should be amended to include an additional column providing calculations without an allowance for dilution.

Data presented in Vol. 6, Table 13.2-4, *Comparison of Guam Water Quality Standards to Modeled Primary and Secondary Treatment Effluent at NDWWTP*, should be supported by inclusion of a technical report/study as an attachment to the DEIS. It is unclear if the data in Table 13.2-4 are actual results from sampling or are based on the characteristics of similar wastewater effluent. Additionally, it is unclear how the Table 13.2-4 constituents were chosen; potentially important metals and organics, including bioaccumulative pollutants such as mercury, PCBs, and dioxin should be included in a revised table.

Water quality impacts may differ for wastewater treatment plants with different capacities. The DEIS states that a detailed assessment of water quality impacts that could occur with regard to the 18 wastewater treatment plant was not conducted because it would have the same treatment processes as the 12 plant, and would be required to meet the same pollutant removal efficiencies and water quality standards. The DEIS expects water quality impacts of the 18 plant to be the same as the 12 plant; however, while certain pollutant removal efficiencies and concentration based discharge limits would be similar, the mass loading (lbs/day) for such pollutants such as solids, nutrients, metals would increase with the increased flow volume and should be assessed for water quality impacts which the DEIS fails to consider.

In addition to the analysis of concentration exceedances for certain regulated constituents, an analysis of mass increases in pollutant loading should be presented. For example, although the Guam Water Quality Standards are expressed in concentrations, nutrient loading is typically important in determining impacts on water quality. Depending on ambient conditions, nutrient loads could cause algae blooms or even attract aquatic species to the outfall area. Increased fresh water discharge to the ocean should also be considered as it could change the water quality profiles, increase the zone of impact, and increase loading of pollutants. Impacts to ocean habitats and aquatic species, such as coral, should also be considered due to increases in flows of fresh water from a larger treatment plant.

The DEIS proposes continued discharge of primary effluent in the short-term, but lacks sufficient information on the potential impacts that could result. For example, while the DEIS mentions impacts associated with violating the Guam Water Quality Standards for ammonia and bacteria, a more detailed discussion, including the size of the plume under various flow scenarios, as well as the types of marine species that might be affected, should be presented. The impacts on recreational uses should also be discussed[18].

> *Recommendation*: Data presented in Table 13.2-4 should be supported by inclusion of a technical report as an attachment to the FEIS. A detailed assessment of water quality impacts of the 18 mgd wastewater treatment plant, including impacts to ocean habitats such as coral reef, is needed. The FEIS should provide the technical basis for the use of the higher initial dilution of 300.
>
> The impacts to the marine biological resources, human health, and recreation should be discussed for any continued discharge of primary effluent from the NDWWTP.

4. Other Wastewater Treatment Plants - Hagatna and Apra Harbor

<u>a. Impacts to GWA's Hagatna WWTP</u>
There is no discussion of the direct and indirect impacts the military buildup will have on the Hagatna WWTP and its collection and conveyance system, nor from the increased wastewater flow to the ocean. The DEIS simply states that the Hagatna WWTP has been shown to have adequate capacity to handle the estimated increased demand, thus only the NDWWTP is analyzed for environmental consequences (Vol. 6, p. 3-55). However, the Hagatna WWTP has CWA compliance problems, as documented in Vol. 6, pp. 3-15 - 3-19. In 2008, GWA issued a sewer connection moratorium, which was lifted in early 2009 based on planned improvements to the collection system to address sewer line capacity issues. GWA is seeking bond funds to pay for the moratorium improvements, but it is unclear whether they will be successful in securing the needed funding. It is also unclear whether GWA’s moratorium planning has taken into consideration the increased wastewater flows anticipated by the military buildup.

EPA has concerns with GWA's planned moratorium improvements. Evaluation of the proposed improvements to ensure they represent the lowest life-cycle-cost and the most environmentally beneficial solution would allow DoD and GWA to determine whether GWA can complete all improvements in a timely manner (2013-2014). Any increased loading to the Hagatna sewer conveyance system prior to the upgrades would further exacerbate the sanitary sewer overflows that currently occur in the system in continued violation of Clean Water Act requirements.

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[18] Vol. 6 p. 19-7 states this may adversely affect recreational activities, however Chapter 11 - Recreational resources, does not mention this impact nor convey specifically how it could affect recreation and other CWA protected uses.

> *Recommendation*: Given the history with existing capacity issues, the FEIS should discuss how the increased loading from the military buildup will affect the Hagatna WWTP, collection system, and ocean water quality. The discussion of impacts should include consideration of wet weather peak flows. The FEIS should also clarify whether the 2.25:1 ratio of average daily flow to peak flow reported in the DEIS is representative of the Hagatna collection system.

b. Impacts to Navy's Apra Harbor WWTP

Additional information is needed to describe the extent of impacts to capacity at the Apra Harbor WWTP and impacts associated with discharges from the increased population. The DEIS indicates that the Navy's Apra Harbor WWTP currently has adequate capacity, both physically and in its permit, to handle the estimated future wastewater demand (Vol. 6, p. 2-67, 3-55). However, with the proposed project, the Apra Harbor WWTP will approach the daily maximum volume which could impact its treatment effectiveness and compliance with its NDPES permit and Guam Water Quality Standards. Peak wet weather discharges should be determined and overflow scenarios described. Effects of any increase in discharge, including additional pollutant loading and other impacts, should be discussed.

Based on the Apra Harbor WWTP NPDES discharge monitoring reports and an inspection conducted by EPA in July 2008, the facility is in non-compliance with its current NPDES permit effluent limits for some metals, total residual chlorine, biological oxygen demand (BOD), and total suspended solids (TSS), and has extensive inflow and infiltration (I/I) problems. In part, violations are attributable to the 'non-routine, highly inorganic non-domestic wastewater from increased ship and carrier/strike group visits and long-term drydocking'[19]. EPA will be reissuing the permit, which will contain more stringent controls and require additional monitoring to assess whether the discharge meets water quality standards (WQSs). Although the DEIS states that proposed improvements to the Apra Harbor WWTP are being executed under other military construction projects (MCON P-262 and P-534) (Vol. 4, p. 2-38), it is not clear whether the scope and purpose of those projects are to address current permit noncompliance and anticipated non-domestic waste stream loads, or whether other improvements will be necessary to achieve compliance with permit requirements. The DEIS also notes that the existing wastewater treatment collection system at Apra Harbor Naval Complex is inadequate to handle the volume of wastewater from berthing a CVN (Vol. 4, p. 2-38).

In addition, the Apra Harbor Naval facility is out of compliance with its Multi-Sector General Permit (MSGP) for stormwater associated with industrial activities.

> *Recommendation*: The FEIS should evaluate adequacy of the Apra Harbor WWTP to treat anticipated domestic and non-domestic wastewater, including peak wet weather flows. While MCON improvements may address capacity issues, they may not necessarily address permit effluent non-compliance issues, and the FEIS should discuss this issue further and recommend measures needed to bring the WWTP into compliance.

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[19] EPA Apra Harbor NPDES inspection report dated July 17, 2008 which references the Navy's December 2005 Effluent Metals Concentration Investigation report.

See also "Pretreatment and Sludge Management" comment below. In addition, the FEIS should evaluate and address the military buildup impact on the Apra Harbor Naval facility's compliance with its MSGP for stormwater associated with non-domestic activities, and impacts to the receiving waters.

5. Regulatory Compliance for New and Increased Discharges in Impaired Waters

The status of any final or draft Total Maximum Daily Loads (TMDLs) should be discussed, along with any applicable TMDL waste load allocations (WLAs). Guam EPA issued a 30-day public notice on December 28, 2009 for draft bacteria Total Maximum Daily Load (TMDL) for 17 beaches in the central and northern areas of Guam (see TMDL discussion in "Cumulative Impacts to Water" comment). Once GEPA finalizes a TDML and it is approved by EPA, the TMDL load allocations will be incorporated by EPA into NPDES permits (wastewater, stormwater); including any new point source discharges to impaired waters (40 CFR 122.4(i))[20]. The EIS should identify the project components with new or increased point source discharges to impaired waters. Guam also has an approved sediment TMDL in the Ugum Watershed.

Recommendation: The FEIS should clarify how proposed new and increased discharges to impaired waters will not exceed TMDL waste load allocations.

6. Navy's Fena Water Treatment Plant

The DEIS lacks an assessment of whether the Fena Water Treatment Plant (WTP) will be able to comply with its NPDES permit, given the anticipated increase in demand. The Navy's Apra Harbor WWTP NPDES permit previously included an emergency discharge point (002) for the Navy-operated Fena Water Treatment Plant. During the application for renewal of this NPDES permit, EPA notified the Navy in 2008/2009 that the Fena WTP emergency discharge point (002) would be subject to a separate NPDES permit because of the numerous emergency discharges (more than 154) that have occurred, the latest being 1.0 MG in December 2009. The increased demand for drinking water due to the military buildup will result in further discharges of this nature.

Recommendation: The FEIS should assess the impacts of the military buildup on the Fena WTP, and the adequacy of the WTP to prevent discharges. The Navy should seek NPDES permit coverage for any discharges from the WTP, and the FEIS should identify appropriate mitigation measures. Mitigation measures should include necessary improvements to the Fena WTP to ensure that any discharges will comply with the CWA and GEPA water quality standards.

7. Pretreatment and Sludge Management

Pretreatment of influent and sludge management for both existing GWA WWTPs and the Navy's Apra Harbor WWTP is of particular concern. At the Apra Harbor WWTP, recent sludge monitoring has shown elevated metals content; in 2008, EPA found violations of effluent limits for a number of constituents including metals. For the Northern District WWTP, EPA determined, as part of the final CWA 301(h) Decision Document, that while toxic pollutants

[20] see also, Friends of Pinto Creek v. EPA, (504 F.3d 1007, 9th Cir., 2007)

have been identified in the effluent, GWA does not have an EPA-approved pretreatment program and has failed to provide a certification that there are no known or suspected sources of toxic pollutants. Any EPA reissued NPDES permit for the Northern District WWTP will contain pretreatment requirements.

> *Recommendation*: Given the potentially high levels of contaminants in the sludge, the FEIS should provide a discussion that demonstrates that DoD is taking sufficient action to ensure pretreatment of influent and appropriate handling of sludge/biosolids for reuse and disposal.

8. Andersen South

Wastewater services do not appear to be available at Andersen South for the 40 to 750 personnel who will use the facility for military operations urban terrain (MOUT) training on a daily basis, and who may bivouac (camp) in the vicinity (Vol 2, p. 2-45). The DEIS states that the facilities and infrastructure at Andersen South have been abandoned and are not being maintained[21] (Vol. 6, p. 3-20).

> *Recommendation*: The FEIS should include additional information regarding the handling of waste at Anderson South.

9. Collection Systems

A system-wide analysis should be conducted to determine the impacts of the proposed increase in wastewater flow. The weaknesses and bottlenecks in the collection system should be identified, as well as the potential for an increase in sanitary sewer overflow events. Options for additions and upgrades to the system should be proposed, as necessary, to prevent impacts to human health and sewage spills to waterways.

> *Recommendation:* The FEIS should include a discussion and analysis of collection system repairs and upgrade needs.

10. Anaerobic Digestion - Energy Generation

Upgrades to the two anaerobic digesters to accommodate anticipated interim flow (Vol. 6, p. 2-83) at the NDWWTP should include enabling cogeneration instead of flaring the methane produced. Maximizing anaerobic digestion and cogeneration has the potential to produce a large majority of the energy required to operate the NDWWTP. Redirecting food waste and fats, oil, and grease from landfills to anaerobic digesters would increase energy production, extend landfill life, and reduce greenhouse gas emissions (from methane capture, offset energy production at the power plant, and hauling sludge to landfills).

> *Recommendations*: As part of the upgrade needed for the project. DoD should assist GWA in establishing a cogeneration unit instead of flaring the methane produced in the

[21] The original sewers in the area flowed to a sewer pumping station and discharged to a GWA collection system and were conveyed to the NDWWTP. Neither the sewer lines nor the sewer pumping station are in operating condition and Andersen South contributes no wastewater flows to the NDWWTP.

anaerobic digesters. Specifically, we recommend the following be considered in the FEIS:

- Including anaerobic digesters at any and all wastewater treatment facilities that are constructed or renovated as part of the buildup, and maximizing the methane capture and cogeneration capacity of those anaerobic digesters;
- Identifying sources of fats, oil, and grease (and possibly food waste) that can be placed in anaerobic digesters in addition to solids from the normal wastewater treatment processes, and establishing a fats, oil, and grease collection program (throughout Guam) to maximize redirection of these waste products from collection systems and landfills directly to anaerobic digesters at NDWWTP. Maui County in Hawaii has successfully established such a program;
- Determining the most appropriate use of methane gas produced in anaerobic digesters to maximize renewable energy generation associated with wastewater treatment. This would likely be in the form of a feasibility study to evaluate combined heat and power options (combustion engines, microturbines, fuel cells, etc.). This study would advise the optimal design process for anaerobic digester renovation and possible expansion.

J. STORMWATER IMPACTS

1. Stormwater Authorities and Regulations

The DEIS provides a limited discussion of the roles of EPA and GovGuam to implement federal and Guam regulations related to stormwater (Vol. 2, Sect. 4.1.1.2) as they apply to DoD actions proposed on Guam. Several activities discussed in the DEIS will need to comply with these regulations to avoid impacts to receiving waters (including groundwater) during construction and post-construction stormwater events. We provide a regulatory overview as a starting point for DoD to expand upon in the FEIS. As stated in Volume 2 of the DEIS, EPA issues CWA National Pollution Discharge Elimination System (NPDES) permits and GovGuam reviews and certifies them under CWA Section 401[22]. The NPDES program regulates stormwater discharges from municipal separate storm sewer systems (MS4s), construction sites, and industrial sources. Currently, Guam is not designated an urbanized area by the Census Bureau; therefore, MS4 permit coverage is not necessary at this time. In the event the 2010 census results in a new urbanized designation for Guam, EPA will issue an MS4 permit which would regulate DoD and other discharges. Detailed information on the NPDES program can be found at: http://cfpub.epa.gov/npdes/home.cfm?program_id=6.

For construction sites that disturb one or more acres, including smaller sites that are part of a larger common plan disturbing one or more acres, operators are required to prepare a stormwater pollution prevention plan (SWPPP) and obtain permit coverage under the 2008 EPA Construction General Permit (CGP). A new CGP is anticipated in July 2011 that will

[22] This is contrary to Table 3.1-1 in Volume 8 of the DEIS that erroneously indicates that NPDES stormwater permit authority has been delegated to Guam EPA from EPA. EPA Region 9 is the NPDES permit authority for Guam.

incorporate new effluent limitations guidelines (74 FR 62996, December 1, 2009) for the construction industry that will set numeric limits for turbidity in runoff and include monitoring requirements[23]. EPA anticipates that most, if not all construction activities associated with the project, including roads, will require CGP coverage. In addition to federal controls, the CGP requires compliance with local Guam sediment and erosion control best management practices (BMPs), and requires compliance with local requirements for post-construction stormwater management on Guam.

Specific military industrial activities are required to obtain stormwater permit coverage under EPA's 2008 Multi-Sector General Permit (MSGP) prior to discharge. In addition to the notices of intent (NOIs) filed with EPA for existing covered industrial facilities, DoD would be required to file NOIs for all new industrial facilities needing coverage under the MSGP.

In addition to EPA's CWA NPDES stormwater authority and GovGuam's CWA Section 401 Certification authority, the Government of Guam's Environmental Protection Agency, Water Pollution Control Program, requires Erosion Control Permits and Environmental Protection Plans (EPP) for development projects that meet specified criteria to comply with its Soil Erosion and Sediment Control Regulations. Guam's Coastal Management Program includes federal consistency requirements that apply when any federal activity, regardless of location affects any land or water use or natural resources of the coastal zone [24].

> *Recommendations:* The FEIS should include a centralized and expanded discussion of EPA and GovGuam stormwater requirements, including what activities will need to comply with these various requirements. It would be very useful to include a table listing DoD activities subject to stormwater permits and the specific federal and Guam authorities under which each activity needs coverage.
>
> All statements in the FEIS stating that the CWA NPDES program is to be delegated from EPA to GovGuam should be corrected to indicate EPA is the CWA permitting and enforcement authority.

2. Stormwater Discharges from Construction Sites

The DEIS acknowledges that stormwater runoff from construction sites is considered one of Guam's most serious water pollution problems (Vol. 2, p. 4-14, citing a GEPA assessment). To mitigate the potential impacts from the proposed construction activities, the DEIS notes that various BMPs would be implemented, as required by local sediment and erosion control regulations and EPA's NPDES permit for construction site runoff (Vol. 2, pp. 4-17, 4-18). With the BMPs, the DEIS concludes that the impacts to surface water would be less than significant (Vol. 2, p. 4-75 in the case of NCTS Finegayan), and this same conclusion is reached throughout the DEIS where construction stormwater discharges are considered. However, even with

[23] More information on these effluent limitations guidelines can be found at: http://www.epa.gov/guide/construction
[24] Coastal Zone Act Reauthorization Act of 1990 (CZARA) Public Law No. 101-508.

stormwater requirements in place, previous construction projects on Guam have contributed to serious water pollution problems, according to the GEPA assessment.

The DEIS (Vol. 2, Table 4.2-1) lists a number of stormwater BMPs intended to minimize pollutant discharges from construction activities, many of which were derived from the 2006 CNMI and Guam Stormwater Management Manual. However, Table 4.2-1 omits certain BMPs recommended in chapter 2 of the Manual that could prove effective in reducing pollutant discharges from the Navy project. These practices are described in the Erosion and Sediment Control (ES&C) Standards 1, 3 and 10 and entail scheduling the clearing and grading activities during the dry season as much as possible, and phasing the overall project to minimize the amount of land disturbed at any one time.

> *Recommendations*: The FEIS should reconcile the apparent inconsistency in the claim that impacts to surface waters would be less than significant even though previous construction projects have caused serious water pollution problems. In doing so, the FEIS should consider the scale of the land disturbance anticipated for the Navy projects and compare the potential stormwater impacts to those of previous projects on Guam. The various types of proposed construction projects should be considered including construction at the main cantonment area, Andersen Air Force Base (AFB), Apra Harbor and road construction throughout Guam. The potential effects of extreme weather events (such as typhoons) should be considered.
>
> The FEIS should include a discussion of the applicability of EPA's recently promulgated effluent limitations guidelines for construction sites (74 FR 62996, December 1, 2009). These regulations include a turbidity limit of 280 nephelometric turbidity units (NTU) applicable to runoff from construction projects disturbing 20 or more acres at any one time (effective in August 2011) and from projects disturbing ten or more acres at any one time, effective in August 2014. These regulations will be included in the next EPA NPDES permit for construction site runoff applicable to Guam to be issued in June 2011. Construction stormwater discharges on Guam could be significantly mitigated if DoD projects meet the new effluent limitations.
>
> The FEIS should acknowledge and explain the implications of Guam Executive Order 2009-13 signed on September 13, 2009 by the Governor. This EO stays for two years the applicability of CNMI and Guam Stormwater Management Criteria to Government of Guam projects such as roads. The DEIS currently assumes that the criteria would be applicable to roads (Vol. 2, p. 4-75 and elsewhere in the DEIS).
>
> We recommend that construction stormwater BMPs in the FEIS include the practices described in Chapter 2 of the Guam and CNMI Stormwater Management Manual that schedule clearing and grading during the dry season and phase the project to reduce the amount of cleared land at any one time. The FEIS should discuss the degree to which these practices would be implemented for the project.

3. Post-Construction Stormwater Discharges

EPA believes the analysis in the DEIS does not support conclusions that impacts to groundwater and surface waters will be mitigated to less than significant. The DEIS indicates that runoff from developed areas impacts both surface water and groundwater, but it does not clearly describe the degree of the impacts (Vol. 2, p. 4-14). In several sections, the DEIS concludes that post-construction stormwater discharges associated with DoD projects will have a less than significant impact to surface water and groundwater (Vol. 2, pp 4-74 to 4-75 in the case of Anderson AFB and NCTS Finegayan). The DEIS bases its conclusion on compliance with applicable local and federal requirements pertaining to stormwater management. However, in the case of impacts to groundwater at Andersen AFB, the DEIS (Vol. 2, p. 4-20) is only able to conclude that implementation of the stormwater pollution prevention plan (SWPPP) has "prevented extensive groundwater contamination." This suggests the SWPPP has not been entirely successful in protecting the important groundwater resources in northern Guam. With regard to impacts to surface water, the DEIS (Vol. 2, p. 4-14) describes urban runoff as a "problem" which raises questions about the assertion in the DEIS that additional runoff from the Navy projects would have a less than significant impact.

The DEIS contains inconsistent information regarding stormwater treatment at Apra Harbor. The DEIS (Vol. 4, p. 2-40) notes that a cyclonic separator would be used to capture and treat stormwater runoff from the staging area in the harbor, presumably due to the potential for contamination of the runoff given the nature of the operations in the area, such as bilge and oily wastewater treatment, temporary hazardous waste storage and cargo handling. The DEIS indicates that the separator would treat the first 0.5 inch of rainfall and bypass the rest (Vol. 4, p. 2-53), but states elsewhere that 100 percent of the runoff might be treated (Vol. 4, p. 4.7). No information is provided regarding pollutants and pollutant concentrations in the runoff, nor the effectiveness of the separator in controlling pollutant discharges.

> *Recommendations*: For groundwater at Andersen AFB (and elsewhere on Guam), the FEIS should elaborate on the nature of any groundwater contamination that has occurred as a result of current stormwater management practices despite existing requirements. The FEIS should then support its conclusion that implementation of existing requirements will be sufficient to ensure a less than significant impact to groundwater resources.
>
> The FEIS should further describe the degree to which runoff from developed areas affects surface waters on Guam, including runoff from the principal land uses such as commercial and residential areas, military areas, port areas, industrial areas and roads. Impacts to the different categories of receiving waters, including rivers and streams, wetlands, marine waters, and resources such as coral, should be discussed. This would provide a clearer picture of the potential effects of the additional runoff from military projects. In evaluating such effects, the FEIS should also consider the mitigation provided by DoD's intent to use low impact development (LID) techniques for the projects (Vol. 2, p. 4-69). In addition, the requirements of section 438 of the Energy Independence and Security Act (EISA) should be considered, as well as EPA's December

2009 technical guidance for implementing section 438[25]. Section 438 of EISA requires federal development and redevelopment projects with a footprint exceeding 5,000 square feet (which would be applicable to the proposed DoD projects) to maintain or restore pre-development hydrology to the maximum extent technically feasible. Compliance with EPA's new technical guidance would reduce hydrologic impacts of the stormwater discharges, as well as pollutant discharges.

DoD should consider all possible resources during the development of stormwater BMPs. For example, the Chesapeake Stormwater Network recently published stormwater design guidelines for karst environments[26]. These guidelines were developed and reviewed by karst and stormwater experts and could inform DoD and its contractors of additional tools (e.g., detailed site investigation, preventing increased runoff to sinkholes, BMPs) to protect groundwater where project activities overlie karst geology and the NGLA.

Regarding Apra Harbor, the FEIS should clarify DoD's intentions regarding treatment of stormwater runoff from the staging area. Information should also be provided concerning the potential pollutants in the runoff, the effectiveness of the separator in controlling the pollutants, and the potential impacts to water quality in Apra Harbor.

4. Endangered Species Act (ESA) Requirements for Construction Stormwater Discharges

Construction site stormwater discharges from DoD projects on Guam will require NPDES permit coverage under EPA's general NPDES permit for construction site runoff (73 FR 40338, July 14, 2008). Coverage under the general permit requires a demonstration of compliance with certain eligibility requirements related to the ESA prior to discharge authorization being granted.

The DEIS describes various mitigation measures that would reduce the impacts to less than significant; however, the DEIS also notes (Vol. 2, p. 10-80) that a biological assessment (BA) is being prepared for an upcoming consultation with the U.S. Fish and Wildlife Service under section 7 of the ESA. Additional mitigation measures necessary for protection of listed species may be identified in the BA or during the consultation; therefore, it is premature, at this time, to draw any conclusions regarding the compliance status of the projects with the ESA-related eligibility requirements of the general permit.

Recommendation: The FEIS should include a full accounting of the Section 7 consultation as it relates to the construction stormwater permit and the mitigation measures ultimately selected to comply with the ESA.

5. Guam Stormwater Policy Task Force

Outcomes from the Guam Stormwater Policy Task Force (Task Force) should be described in the FEIS, including long-term stormwater BMPs selected for the haul road network (HRN) and maps

[25] The EISA Section 438 technical guidance is available at: http://www.epa.gov/owow/nps/lid/section438

[26] Chesapeake Stormwater Network Technical Bulletin No. 1, Stormwater Design Guidelines for Karst Terrain in the Chesapeake Bay Watershed, June 2009. Available at: http://www.chesapeakestormwater.net/all-things-stormwater/stormwater-guidance-for-karst-terrain-in-the-chesapeake-bay.html

illustrating where various stormwater control measures will be located. The Task Force was formed to provide a forum for local and federal agencies to collaborate on measures to reduce stormwater impacts from Guam's transportation network as it is modified to meet the military expansion needs. EPA recognizes the efforts of the Task Force, chaired by FHWA, and is currently participating with GovGuam and other local agencies to develop a HRN Implementation Plan that will identify where specific stormwater BMPs will be most appropriate to prevent stormwater impacts to surface and groundwater from road runoff. EPA anticipates the results of this effort will be incorporated into the HRN SWPPPs.

> *Recommendation*: The FEIS should describe outcomes of the Guam Stormwater Policy Task Force related to the HRN, including where and how selected BMPs will be installed to prevent stormwater impacts from road runoff. The FEIS should also identify whether stormwater BMPs for on-base roads will be consistent with the HRN Implementation Plan and Stormwater Management Plan.

K. CORAL REEF AND WETLANDS IMPACTS

1. Coral Reef Impacts and Clean Water Act Section 404 Compliance for CVN Berth

a. Significant Impacts to Coral Reefs from the CVN Berthing project

One of EPA's foremost concerns is the high level of impact to coral reefs from the proposed CVN berthing project. Coral reefs have many important functions and services in Apra Harbor including essential fish habitat, invertebrate habitat, endangered sea turtle feeding and resting habitat, shoreline protection, biodiversity, commercial, subsistence, and recreational fisheries, commercial and recreational diving, cultural value, aesthetics, buffering of ocean waters, biogeochemical cycling, larval sources, etc. Given their significant ecological, social and economic values, coral reefs are afforded protections by federal laws and policies including the CWA and Executive Order (EO) 13089 on Coral Protection. The Clean Water Act Section 404(b)(1) designates coral reefs as one of only six examples of special aquatic sites, thus establishing a higher level of review and protection for activities affecting them. EO 13089 was signed by the President in 1998 to ensure federal agencies are implementing their authorities to protect these valuable resources.

This section of the comments assesses CWA Section 404 compliance because DoD has stated their intention to integrate CWA 404 requirements into the EIS in order to streamline the Army Corp's CWA 404 permitting process. The analysis of alternatives and mitigation under NEPA is less specific than required for CWA 404. Deferring to the 404 permit may be appropriate for many projects, however the magnitude of impacts in this project and the substantial disagreement on how these impacts will be assessed, minimized and mitigated warrant close consistency with CEQ regulations and guidance[27].

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[27] Per 40 CFR 1505.2(c), the ROD must state "whether all practicable means to avoid or minimize the environmental harm from the alternative selected have been adopted, and if not, why they were not", and CEQ Guidance[27] states that the ROD must identify "the mitigation measures and monitoring and enforcement programs that have been selected and plainly indicate that they are adopted as part of the agency's decision."

Impacts to coral reefs on the scale proposed in the DEIS are unprecedented in recent CWA 404 permit history. To move this project component forward in a timely manner from a CWA Section 404 permitting perspective, maximum practicable avoidance and minimization, followed by appropriate compensatory mitigation are essential. Based on DoD's assessment method, Preferred Alternative 1 (Polaris Point) would result in approximately 25 acres of direct impacts and 46 acres of indirect impacts to coral reef habitat.

As the proposed project would result in significant impacts to coral reefs, EPA considers the potentially affected corals to be a candidate aquatic resource of national importance (ARNI). Without further efforts by DoD to adequately assess impacts, impact avoidance, and appropriate mitigation, EPA would pursue the CWA permitting elevation process pursuant to the 1992 Memorandum of Agreement between the EPA and the Department of the Army, Part IV, paragraph 3(a) regarding Section 404(q) of the Clean Water Act. We also consider the inadequate assessment of impacts and mitigation to corals and other waters of the United States to be significant enough to warrant elevation to CEQ if these issues are not resolved in the FEIS. The following comments elaborate EPA's concerns regarding coral reef assessment and CWA compliance.

b. Inadequacy of the Coral Reef Impact Assessment

The Navy's impact assessment methodology is inadequate for the purposes of CWA permitting and underestimates the loss of coral reef habitat functions and the level of adequate compensatory mitigation. The photographic assessment method uses planar percent coral cover as the only metric for describing impacts to coral reefs for the CVN project. EPA, the U.S. Fish and Wildlife Service (FWS) and the National Marine Fisheries Service (NMFS) (herein "resource agencies") have determined that percent coral cover alone is not adequate to satisfy the requirements of the 2008 Corps-EPA Compensatory Mitigation Rule. The U.S. Army Corps of Engineers (Corps), the CWA Section 404 permitting authority, has informed the Navy that additional functional assessment data is needed commensurate with the scale of potential impacts.

In interagency discussions since 2008, the resource agencies recommended the use of in-situ field data collection methods, before the Navy's contractor conducted the photographic surveys. Both the FWS-NMFS in-situ method and the Navy's photographic methods are scientifically defensible and widely used. At issue is the type of data needed to adequately satisfy the requirements of the 2008 Corps-EPA Compensatory Mitigation Rule. This rule emphasizes the assessment and mitigation for aquatic resource "functions" rather than "area" alone and states a preference for the use of functional assessment methods where available and practicable (40 CFR Part 232.3). The resource agencies find the in-situ method is far better than the photographic method because it collects coral abundance, size, morphology, and biodiversity in an ecosystem context, which directly relates to coral reef functions (e.g. reproduction, fish habitat, tissue surface area for photosynthesis). This method has been made available by NMFS and FWS, is practicable, and can be completed in accordance with DoD's desired permitting and construction schedule.

The additional assessment data should be collected to optimize avoidance, minimization, and the development of appropriate compensatory mitigation for NEPA disclosure and in the CWA Section 404 permitting process. Based on Vol. 9, Appendix J-1 (*Draft Comparison of a Photographic and an In Situ Method to Assess the Coral Reef Benthic community in Apra Harbor, Guam*), the Navy assessment appears to underestimate impacts to coral reefs. The presentation of coral size-frequency distribution in Vol. 4 Figure 11.1-15 does not present an accurate distribution of sizes because of a bias toward small colony size in the photographic assessment method. Appendix J-1 provides a review of these data and the FEIS should acknowledge the limitations of the size data presented to better inform the CWA Section 404 permitting process.

On December 11, 2009, EPA, NMFS, FWS and the Corps met with DoD to continue discussion of concerns with the Navy's assessment. Based on that meeting, it does not appear that DoD intends to modify the Navy's assessment, as recommended.

> *Recommendation*: Adequate data on coral abundance, size, morphology, and biodiversity in Apra Harbor must be collected. To assist in this data collection, FWS-NMFS provided a scope of work for Marine Resource Surveys, Impact Assessment, and Habitat Equivalency Analysis (HEA) dated October 15, 2009. DoD could either fund the FWS-NMFS proposed scope of work or collect the additional assessment data itself. It is critical that an adequate coral reef assessment method be described in the FEIS and that DoD commit in the ROD to collecting the additional data as part of the CWA Section 404 permitting process. Absent this information, EPA is prepared to elevate in accordance with the CWA 404(q) and CEQ processes.

c. Compliance with 404(b)(1) Guidelines

EPA has determined that the DEIS does not contain sufficient information to demonstrate compliance with the CWA 404(b)(1) Guidelines (Guidelines). The Corps also informed DoD they had made the same determination, i.e. the level of detail and complexity of the alternative analysis in the DEIS is insufficient to demonstrate compliance with the Guidelines. The assessment of alternatives under NEPA is not in itself sufficient for analyzing alternatives for purposes of demonstrating 404(b)(1) compliance under the CWA. Pursuant to the Guidelines, the applicant bears the burden of clearly demonstrating that the preferred alternative is the least environmentally damaging practicable alternative (LEDPA) that achieves the overall project purpose, minimizes impacts to the aquatic environment to the maximum extent practicable, and does not cause or contribute to significant degradation of waters of the U.S (WUS). The Guidelines contain four main requirements (40 CFR 230.10(a) through (d)) and each must be satisfied to comply with Section 404. Our comments on each of these sections follow:

<u>LEDPA Determination - CWA Section 230.10(a)</u>

To comply with the Guidelines, a project must include a comprehensive evaluation of a range of alternatives to ensure the permitted alternative is the LEDPA. Identification of the LEDPA is achieved by performing an alternatives analysis that estimates the direct, indirect, and cumulative impacts to jurisdictional waters resulting from a set of on- and off-site project alternatives.

Project alternatives that are not practicable and do not meet the project purpose are eliminated. The LEDPA is the remaining alternative with the fewest impacts to aquatic resources, as long as it does not have other significant adverse environmental consequences. Only when this analysis has been performed can the applicant or the permitting authority be assured that no discharge other than the practicable alternative with the least impact on the aquatic ecosystem will be authorized. As the DEIS does not provide a full alternatives analysis, we cannot determine compliance with the Guidelines.

EPA questions the rationale described in the DEIS for selecting Polaris Point over alternative 2 (Former SRF) as the LEDPA. Polaris Point would result in approximately 1.5 acres of additional direct impacts to coral reef and a dredging footprint that is 9 acres larger than Former SRF. The DEIS states that even though Former SRF has fewer direct impacts to coral reef and a smaller dredging footprint it would have greater construction and operational impacts because of closer proximity to aquatic resources such as Big Blue Reef, and increased potential impacts from sedimentation from upland sources. As described in the Guidelines, coral reefs are special aquatic sites that are recognized as significantly influencing or positively contributing to the general overall environmental health or vitality of the entire ecosystem of a region. Potential impacts of sedimentation from construction and operations at Former SRF should be addressed through proper implementation of best management practices as described in Vol. 9, Appendix D of the DEIS. Based on avoidance of aquatic resources, EPA believes Former SRF may be the LEDPA due to avoidance of 1.5 acres of coral reef, and a dredging footprint that is 9 acres smaller than Polaris Point.

An alternative not reviewed in the DEIS has been developed by NMFS, using Navy criteria, and proposed for DoD's consideration. This alternative falls within the Polaris Point footprint and would reduce the size of the turning basin, and thereby reduce impacts to coral reef and soft bottom habitats in Apra Harbor. EPA believes this alternative warrants evaluation in the FEIS.

Determining the LEDPA requires a clear description of direct, indirect, and cumulative impacts. The description of the size of dredge and fill footprints in Volume 4 is extremely confusing as it applies to direct impacts. For example, Table 4.3-1 presents two sets of numbers (2 Dimensional and 3 Dimensional) for acres of direct coral reef impact from dredging. Page 4-39 states yet a different number of acres of direct coral reef impact. Chapter 11 states that direct impacts are overestimated in that section because the study assumed a 60 ft dredge depth rather than 51.5 feet, the actual dredge depth. These discrepancies are misleading and make comparisons of the alternatives unnecessarily difficult. In addition, the amount of fill for the Former SRF alternative is never accurately described. For example, Table 4.3-1 states the fill for Former SRF as "3.6 ac (1.5 ha) plus additional for finger piers". The DEIS fails to adequately describe fill for the finger piers, the size of the resulting impact, and the construction design (fill or pilings).

The DEIS does not adequately address indirect and cumulative impacts of the proposed alternatives to marine waters in Apra Harbor, including coral reefs. Volume 4, Sect. 4.2.2 describes indirect sediment impacts from dredging as minimal, short term (an hour or two after dredging ceases), yet table 4.3-1 describes indirect impacts as a 200 meter buffer around the dredged area or 46-47 acres of impact to coral reefs. Section 11.2.2.2 states there is no basis for the 200 meter buffer zone in relation to the indirect impact area, and that based on sediment modeling, the actual indirect impact zone is 40 feet, but does not present the acreages of actual indirect impacts. The FEIS should include a consistent description of the most realistic impacts from sedimentation. A discussion of the observed impacts of sedimentation from the ongoing dredging at Kilo Wharf in Apra Harbor would be useful to include.

The cumulative impacts discussion does not assess cumulative impacts to coral reefs from recent and future planned projects in Apra Harbor. For compliance with both NEPA and the Guidelines, the DEIS should include an analysis of cumulative impacts (acreages and cover) to coral from Inner Apra Harbor dredging, Kilo Wharf construction, planned commercial port improvements, increased stormwater runoff from construction and operations, amphibious vehicle landing practice, and other projects.

> *Recommendations*: DoD should consult with the Corps and EPA to ensure sufficient information is provided in the FEIS to comply with the Guidelines and correctly identify the LEDPA. Providing the appropriate level of information in the FEIS could help prevent regulatory delays and advance the CWA Section 404 permitting process. DoD should review the proposed NMFS alternative in the FEIS and include it in the 404(b)(1) alternatives analysis LEDPA determination.
>
> The FEIS should accurately identify the direct and indirect impacts from dredge and fill activities and from sedimentation and use consistent acreages of impact throughout the document.
>
> The FEIS should include an expanded discussion of cumulative impacts to coral reefs in Apra Harbor and generally on Guam, including impacts from other dredge and fill projects, increased stormwater runoff, and other potential impacts (See comment Cumulative Impacts to Coral Reefs below).

<u>Water Quality - CWA Section 230.10(b)</u>
This section of the CWA , which requires that a determination be made as to whether the project will cause a violation of water quality standards, during and after construction of the CVN berth, turning basin, and channel. This determination is not included in the DEIS. There will be discharges that will cause degradation of water quality in Apra Harbor from pier construction, dewatering of dredged materials, and sediment plumes from dredging activity. EPA is concerned as to how these discharges will comply with Guam's water quality standards[28].

The DEIS (Vol. 9, Appendix D, Sect. 1.2) discusses a number of potential operational and engineering controls that could be considered as dredging and disposal BMPs. However no particular recommendations are made regarding which BMPs the Navy would propose to use under various circumstances for this project. EPA is particularly concerned about minimizing

[28] Guam's water quality standards are available at: http://node.guamepa.net/programs/water/WQS.pdf

impacts to high value corals adjacent to and outside the immediate dredging footprint in outer Apra Harbor.

> *Recommendation*: The FEIS should discuss in more detail how dredging in the immediate vicinity of higher value coral reef communities would likely occur, and what control measures could be employed in those specific locations. Redundancy of physical barriers (silt curtains, silt screens, and bubble curtains) should be considered for these sites (e.g., some at the resource of concern, as well as others at or around the dredging operation). Similarly, this section should commit to operational controls, such as conducting work in and immediately adjacent to high value coral communities only when wind and tidal conditions would transport suspended solids into deeper water and away from corals. Finally, the FEIS should describe how BMPs will prevent discharge of water and pollutants from wharf and staging area construction activities for moderate size rain events, exceeding the 2-year event.

<u>Significant Degradation - CWA Section 230.10(c)</u>
The Guidelines prohibit a project that causes or contributes to significant degradation of aquatic resources. Effects contributing to significant degradation include: (1) adverse affects on plankton, fish, shellfish, wildlife, and special aquatic sites (40 CFR 230.10(c)(1)), (2) adverse affects on life stages of aquatic life (40 CFR 230.10(c)(2)), (3) aquatic ecosystem diversity, productivity, and stability including loss of fish and wildlife habitat (40 CFR 230.10(c)(3)), and (4) impairment or destruction of endangered species habitat (40 CFR 230.30(2). Table 11.2-13 correctly concludes that there would be significant and long term direct impacts to the coral reef ecosystem. We disagree that these impacts will be mitigated to "less than significant" by the DEIS mitigation proposals because (1) some of the proposed mitigation options are unlikely to replace lost aquatic resource functions, and (2) the DEIS underestimates the amount of mitigation required. See comments below.

<u>Mitigation - CWA Section 230.10(d)</u>
Compensatory mitigation is intended only for unavoidable impacts after the LEDPA has been determined. Failure to adequately offset significant project impacts is grounds for denial of the CWA 404 permit application. Based on our review of the mitigation discussion in the DEIS, we do not agree that the DEIS mitigation proposals adequately compensate for proposed project impacts.

In addition, EPA, FWS, and NMFS have determined that the DEIS underestimates the amount of mitigation required to compensate for the impacts to corals. We support the application of Habitat Equivalency Analysis (HEA) for scaling mitigation, but the HEA presented in Vol. 4, Chapter 11 and Vol. 9, Appendix E is based on insufficient data or flawed analyses. Several aspects of the HEA analysis bias the scaling of mitigation to underestimate the mitigation required to replace lost aquatic system functions and services. These include: inadequate analysis of coral reef ecosystem structure and function, failure to consider impacts to non-coral habitats in the mitigation calculations, use of inappropriate and inaccurate data ("100% coral equivalents/3-dimensional area/Coral Habitat Index"), and lack of data on recovery potential at mitigation sites. Our comments on the various mitigation proposals in the DEIS follow:

- Artificial reefs - EPA concurs with NMFS, FWS and the Corps that creation of artificial reef is not an environmentally preferable mitigation of impacts at the CVN. This position was provided to DoD in a December 18, 2008 joint EPA/FWS/NMFS letter and in several discussions that have followed. Concerns with this method include insufficient research demonstrating replacement of coral reef habitat functions, and vulnerability of artificial substrate to movement during storm events resulting in impacts to adjacent coral reef. These potential impacts of artificial reefs on adjacent corals and non-coral marine habitats could be significant and were not discussed in the DEIS.

- Coral Transplantation - Coral transplantation should be attempted as a component of the avoidance and minimization measures of dredging and not solely as a compensatory mitigation measure as implied in the DEIS. EPA appreciates DoD considering this as one possible option for coral reef enhancement but we remain concerned due to scientific evidence that coral transplantation often has a poor long-term survival rate.

- NDWWTP - This mitigation option involves infrastructure upgrades to GWA's Northern District Wastewater Treatment Plant (NDWWTP) to secondary treatment to compensate for loss of coral reef habitat. While EPA recognizes the benefits of such an upgrade for water quality in Guam, impacts to coral reefs from wastewater discharges in Apra Harbor or in the vicinity of the NDWWTP outfall have not been documented. It is unlikely that wastewater upgrades could provide the coral recovery potential on the scale of the dredging impacts and estimates of recovery potential are lacking.

- In-Lieu Fee (ILF) Program - Volume 4, Chapter 4, p. 4-42 of the DEIS states that while the ILF program approach is supported by DoD for Guam, and supported as a mitigation approach by the Corps-EPA Compensatory Mitigation Rule, such a program has yet to be established for Guam. However, both EPA and DoD are supportive of the development of the Guam ILF Program, prepared by the Micronesia Conservation Trust in collaboration with the Guam Natural Resource Subcommittee. The primary objective of this ILF program is to offset unavoidable impacts to coral reef habitat by emphasizing a watershed approach in the planning, implementation, management and long-term protection of mitigation projects. Even though this ILF program is still under development, the FEIS should include a discussion of the status, objectives, and potential for this program to offset CVN impacts to unavoidable coral reef functions.

- Watershed Restoration - The DEIS discussion of watershed restoration focuses on reforestation/aforestation and isolated projects on DoD land. The resource agencies recommended DoD pursue watershed aforestation and related projects to restore coral reef habitat through near shore water quality improvements in the Watershed Aforestation Coral Reef Restoration Outline submitted to DoD dated October 13, 2009. We recommend broadening the description of the watershed mitigation effort to include a range of actions that are known to effectively reduce erosion and sediment transport. These may include aforestation, riparian restoration and streambank stabilization, stormwater BMPs for highway runoff, reinforcement of steep badland slopes with erosion control geotextiles, sediment retention structures, wetland enhancements, etc. Such measures to control erosion may reduce the land area required for management, accelerate the reduction in sediment loads, and improve the sustainability of erosion control over time as compared with aforestation alone. We emphasize that any erosion control effort must significantly reduce sediment loads from the watershed to result in benefits to coral reefs, and caution that isolated actions restricted to Navy land (e.g. Ordnance Annex Aforestation) may be of insufficient scale to significantly reduce loads from large watersheds. We recommend screening watershed proposals for suitability using desktop watershed models to estimate load reductions resulting from specific erosion control measures.

Recommendations: DoD should continue to work with EPA, NMFS, FWS and the Corps to identify and assess suitable coral reef mitigation alternatives in the FEIS. To meet the projected construction start schedule of October 2012, EPA anticipates a Corps permit application, including a complete mitigation plan, will be submitted no later than summer 2011.

- The FEIS should scale the selected mitigation projects using an updated HEA based on coral abundance, size, and morphology data. The FEIS should also propose compensatory mitigation for impacts to non-coral marine habitats.
- Creation of artificial reef should be dismissed as an acceptable mitigation alternative. If DoD continues to consider this alternative, potential impacts of implementation (i.e. impacts of artificial reefs on adjacent corals and non-coral marine habitats), should be assessed in the FEIS.
- DoD should commit to implement coral transplantation as an avoidance and minimization measure and not as compensatory mitigation in the FEIS.
- Upgrading the NDWWTP to secondary treatment should be dismissed as a coral reef mitigation option absent a clear connection between the wastewater improvements and coral reef enhancement.
- The FEIS should discuss the status, objectives, and potential coral reef enhancement opportunities that could be achieved by the developing Micronesia Conservation Trust/Guam Natural Resource Subcommittee ILF program.
- We recommend the FEIS discussion of watershed enhancements include a broader suite of erosion and sediment control measures, beyond aforestation, aimed at water quality improvements that would directly benefit coral reef habitat.

d. Disclosure of Selected Mitigation in NEPA document

The DEIS considers a suite of mitigation alternatives but states that a final mitigation determination may not be made until after the ROD is adopted and during the CWA 404 permitting process (Vol. 4, p. 4-39). We believe it is most consistent with NEPA's public involvement principles (40 CFR 1500.1 (b)) to identify in the FEIS and the ROD the specific project mitigation, monitoring and enforcement that will be pursued for implementation.

Deferring to the 404 permit may be appropriate for many projects, however, the magnitude of impacts in this project and the substantial disagreement on how these impacts will be mitigated warrant close consistency with CEQ regulations and guidance[29]. We recognize that the details of the mitigation and monitoring plan will be further developed as part of CWA 404 permitting.

> *Recommendation*: To better serve public disclosure and be most consistent with CEQ guidance, DoD should identify in the FEIS and the ROD specific mitigation, monitoring and enforcement measures that have been selected as part of the final decision.

e. Additional Comments - Coral Reefs and CWA 404 for CVN

- Volume 4, Sect. 230.20 considers removal of soft bottom habitat to be a potential benefit as it would provide substrate for additional coral establishment and other benthic organisms. EPA considers this to be a false assumption without further evidence that these areas would not be buried in sediment before coral could establish in these areas. In addition, dredged areas will be subject to maintenance activities which could limit the establishment of corals in these areas. The FEIS should remove this statement or provide sufficient proof that there would be benefit to coral.
- Volume 4, page 4-39 states that areas with the lowest coral cover (<10 percent) would have the greatest dredging impacts while areas with highest cover (70 to 90 percent) would have the lowest dredging impacts. Avoiding high coral cover areas may be preferable but the assessment fails to describe other critical attributes such as size, morphology and biodiversity of the coral habitat. The FEIS should implement the assessment method recommendations provided above and describe impacts of dredging based on the broader suite of coral habitat attributes.

2. Haputo Coral Reef Ecosystem

The DEIS does not demonstrate that significant impacts to this resource can be mitigated to less than significant. The preferred Main Cantonment Alternative 2 would be located at Finegayan. Just offshore of this area is the Haputo Ecological Reserve Area (ERA) (Vol. 2., p. 3-15). The Haputo ERA was compensatory mitigation measure for impacts to corals that occurred from the original construction of the Navy's Kilo Wharf (Vol. 2, p. 11-33) and is described as a vibrant thriving coral reef community with a diverse biota of algae, invertebrates and fish, containing well-developed coral reefs containing some of the highest coral cover on Guam (Vol. 2, p. 11-20). It is also a Specific Habitat Areas of Particular Concern that is essential to the life cycle of important coral reef species (Vol. 2, p. 11-20).

The DEIS acknowledges that because the Haputo shore area is relatively accessible, many of the marine biological resources may be adversely affected by long-term recreational activities due to

[29] Per 40 CFR 1505.2(c), the ROD must state "whether all practicable means to avoid or minimize the environmental harm from the alternative selected have been adopted, and if not, why they were not", and CEQ Guidance[29] states that the ROD must identify “the mitigation measures and monitoring and enforcement programs that have been selected and plainly indicate that they are adopted as part of the agency’s decision.”

the substantial increase of people[30] potentially using Haputo ERA and coastal waters as a result of the proposed action (Vol. 2, p. 11-28). Recreational activities such as snorkeling, scuba diving, boating (anchoring, fishing, diving, snorkeling), and fishing practices (pole, gill/throw net, and spear fishing) may result in indirect loss of Haputo ERA habitat and biota, and the DEIS concludes that this is a significant impact. However, it claims that it can be mitigated to less than significant by providing educational materials and requiring visitors to view a short video before entering. It states that designating multiple mooring areas offshore and increased efforts toward ERA enforcement would also mitigate impacts (Vol. 2, p. 11-58). The DEIS does not identify who would implement this latter mitigation, and the statement that these mitigation measures would reduce impacts to less than significant is not supported.

The Haputo ERA mitigation site has never been effectively managed or protected, nor is there a management plan. As protection of this resource was compensatory mitigation from a previous DoD project, and was never fully implemented, it is vital that additional impacts from this project receive effective mitigation. Education should be a component of any mitigation strategy, but education alone is not sufficient to protect the resource from the impacts of increased use. Unless there are specific commitments to effective mitigation, this impact remains significant.

> *Recommendation:* EPA recommends that a Haputo Management Plan be developed with the intent of maintaining the present good condition of the marine resources while allowing sustainable uses. The management plan should include measures to protect the marine biological resources and monitoring and regular assessments of the resource to track its condition. It should also establish a long term educational, management and enforcement program. The FEIS should identify the commitment to develop this management plan, as well as identify who would carry out and fund its implementation.

3. Impacts to Wetlands and other Waters of the U.S.

a. Compliance with 404(b)(1) Guidelines

For wetlands and waters of the U.S. (WUS) not associated with the CVN Berthing Project, the DEIS provides only a cursory discussion and no in-depth analysis of compliance of the various project alternatives with the Guidelines. For example, Volume 6, Related Actions-Utilities and Roadway Projects (p. 6-31) erroneously concludes that there is no need to conduct a 404(b) (1) alternatives analysis because there are no potential impacts from any alternative to wetlands. The analysis of practicable alternatives under Section 404 is not limited only to wetlands impacts, but includes all other WUS. The DEIS identifies potential impacts to WUS, including wetlands, from the replacement of pipelines and bridges, even though a 404-level jurisdictional analysis has not yet been completed and verified by the Corps. Figure 6.2-1 shows potential direct impacts to wetlands along the water line replacement corridor and Table 6.2-5 quantifies

[30] The DEIS identifies 17,600 persons living on main cantonment and South Finegayan under the proposed action that would directly impact Haputo ERA (Haputo Beach included) and Guam National Wildlife Refuge (Vol 2, p. 9-17)

bridge replacement-related impacts to WUS. These potential impacts must be analyzed for compliance with the 404(b)(1) Guidelines.

> *Recommendation:* EPA offers the following recommendations to help facilitate compliance of the project with the Guidelines:
>
> - The FEIS should include an evaluation of the project alternatives in order to demonstrate compliance with the 404(b)(1) Guidelines and authorization of the LEDPA. The alternatives analysis should include a reasonable range of alternatives that meet the project purpose while avoiding and minimizing damage to WUS, including wetlands. If, under the proposed project, dredged or fill material would be discharged into WUS, the FEIS should discuss alternatives to avoid those discharges.
> - The FEIS should describe the status of consultations with the Corps regarding CWA Section 404 permitting, and how the Proposed Project meets 404(b)(1) Guidelines which require that projects first avoid, then minimize, and finally mitigate any impacts to WUS, including wetlands and other special aquatic sites.
> - The applicant should provide a table and clear narrative on the direct, indirect/secondary and temporary impacts to WUS, including wetlands, in the FEIS.

b. Geographic Extent of Jurisdictional Waters of the United States

The DEIS does not contain a delineation of wetlands and other WUS to be affected by the proposed project, sufficient for permitting under Section 404 of the CWA. The DEIS relies mostly on a review of the U.S. Fish and Wildlife's National Wetland Inventory (NWI) maps to determine the geographic location and extent of wetlands and other waters, and states that various areas will be ground-truthed to determine presence/absence of wetlands as part of an additional remote sensing investigation. NWI maps and remote sensing data are not adequate to assess the geographic extent of jurisdiction under the CWA in the absence of additional field data collection and verification[31]. A 404 appropriate delineation of the extent of WUS, including wetlands, for the project has not yet been completed and verified by the Corps.

In the absence of other data, NWI data can indicate the potential for wetland areas and be used for macro-level impact analysis, with the qualification that the analysis is not based on a jurisdictional determination. However, a clear presentation of wetland and WUS impacts is not presented even at the macro-level for the NEPA analysis. The DEIS acknowledges that permanent, temporary and secondary/indirect impacts to WUS would occur from construction of the proposed project but the DEIS does not clearly disclose the extent of impacts to waters. For the northern area, the DEIS states there would be Corps permitting for potential impacts to the

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[31]Wetlands under the CWA are delineated using the Corps of Engineers 1987 Wetlands Delineation Manual (Environmental Laboratory 1987) and any applicable supplements. The manual utilizes a three-parameter test, which examines field indicators of wetland conditions. Wetland conditions include the presence of (1) hydrophytic vegetation, (2) hydric soils, and (3) wetland hydrology. In addition, non-wetland waters/streams that fall between the Ordinary High Water Marks (OHWM), as described at 33 CFR Sections 328.3 and 329, are jurisdictional under the CWA. Determination of the geographic extent of these “other waters” requires field verification utilizing appropriate Corps and EPA guidance.

cave/pool system (Vol. 6, p. 6-15) but no additional information is provided including how these impacts could be mitigated.

> *Recommendation*: The FEIS should include results of a 404-level jurisdictional delineation to determine the extent of impacts to waters and identification of the LEDPA for the alternatives presented in the DEIS. If DoD does not provide this information in the FEIS, then the FEIS should at a minimum acknowledge that jurisdictional delineations consistent with the Corps protocol will be conducted prior to 404 permitting.

c. Comments on Specific Wetlands

<u>Apra Harbor Wetlands</u>: There are significant wetlands in this area, totaling approximately 158 acres of mostly estuarine, intertidal wetlands, as identified on NWI maps, and some unverified wetlands per the Corps 1987 Wetlands Delineation Manual. An additional 124 acres of wetlands have been identified on Naval Base Guam. The DEIS states that a 404 permit is needed for construction in this area and that the screening process in the DEIS has identified the LEDPA consistent with the Section 404(b)(1) guidelines (Vol. 2, p. 4-127). Since a jurisdictional delineation has not been completed and verified by the Corps for this area, a LEDPA determination cannot be made. In addition, the DEIS states that the loss of wetlands or mangrove forest in this area would be considered "potentially significant" to DoD (Vol. 2, p. 10-79). EPA considers the loss of these resources to be significant.

> *Recommendations:* The FEIS should clarify whether the ongoing investigation will map wetlands per the Corps 1987 Wetlands Delineation Manual for inclusion in the FEIS, as well as other waters (i.e. mudflats, vegetated shallows, and streams with an ordinary high water mark) (Vol. 2, p. 4-52). Once the delineation has been verified by the Corps, a LEDPA determination can be made. We recommend identifying any loss of these wetlands or mangrove forest as a significant impact in the FEIS.
>
> In addition, the following discrepancies should be corrected: The wetland acreage for Apra Harbor-Naval Base Guam vegetation communities listed in Vol. 2, Table 10.1-19 (p. 10-60) does not correspond to wetland acreage totals presented on p. 4-52. Also, the potential vegetation impacts in Vol. 2, Figure 10.2-14, are not consistent with Figure 4.2-2 in terms of mapping wetlands in Apra Harbor and the Naval Base Guam.

<u>Navy Munitions Site (NMS) Wetlands</u>: According to the DEIS, this area has a total of 1,469 acres of wetlands (Vol. 2, p. 4-61) and 250 acres are located near the magazine storage areas. The DEIS states that direct impacts to wetlands from the munitions magazines will be avoided by shifting the footprint, and this will be confirmed once additional information is obtained through the planned remote sensing wetlands delineation (Vol. 2, p. 4-97). It also states that there may be opportunities for using older magazines with appropriate upgrades or replacing existing magazines, instead of developing ammunition storage facilities in currently undeveloped areas (Vol. 1 p. 3-8).

Recommendation: A full jurisdictional delineation should be performed for NMS and avoidance of impacts should occur through changes to the project description. DoD should maximize avoidance of wetlands and commit to upgrading or replacing existing magazines wherever possible to reduce the project footprint. Modifications to training activities should also occur to reduce foot, and wheeled and tracked vehicle traffic near and through numerous surface water drainage feature crossings (Vol. 2, p. 4-99). The conclusion that there would be no long-term impairments to these waters is not supported.

The DEIS does not list wetlands as a vegetation type for NMS (Vol. 2, p. 10-67, Table 10.1-23), while Fig 10.1-26 page 10-68 depicts extensive wetlands. Also, riverine forest vegetation communities likely support jurisdictional wetlands. The FEIS should address this inconsistency.

<u>Wetlands Associated with Road Project Locations</u>: It does not appear that all wetlands associated with road projects are identified in the DEIS. For example, in Volume 2, Section 4.1.3.4, several swales, drainage-ways, sinks, and streams are listed in the Central Region, but there is no mention of wetlands associated with these surface waters even though several photographs depict the presence of likely wetlands. The Volume 2 discussion of Central Region road improvements lacks information regarding impacts from the improved Route 1 crossing at Agana River and other streams. Impacts to vegetation types, wetlands and other WUS are not discussed and there is no mention of these WUS being delineated (Vol. 2, p. 10-55). Volume 6 also has very limited route-specific information on wetlands, with the exception of table listings in Terrestrial and Marine Resources sections which are not delineated and further analyzed for the specific routes (e.g. Vol.6, pp. 12-18 to 12-24 for Terrestrial Resources; similar tables are found in Marine Resources chapter). It also seems unlikely that estimated impacts to WUS from proposed bridge replacements (Vol. 6, Table 6.2-5 p. 6-23) are fully captured in these tables. Ravine communities associated with rivers may support jurisdictional WUS. In addition, strand communities that lie below the mean high tide are jurisdictional WUS. This is not acknowledged in the DEIS. Some of these vegetation communities are found in Anderson North, Anderson South, non-DoD lands, and South Finegayan, and Naval Base Guam. (Vol. 2, p.10-6).

Recommendation: The FEIS should provide additional information on Route 1 impacts at Agana River and other streams, including a delineation of these WUS, and ensure that wetlands associated with other road projects are included in estimated impacts to WUS. The FEIS should include a discussion of waters associated with ravine and strand communities, identify their locations, and discuss any proposed impacts consistent with the Guidelines

<u>Tinian Wetlands</u>: The DEIS states that the preferred alternative on Tinian may impact wetlands and that additional studies are planned to verify locations (Vol. 7,p. 3-80). The results of these studies should be included in the FEIS and the preferred alternative modified to avoid wetlands to the maximum extent possible.

L. CUMULATIVE IMPACTS TO WATER RESOURCES

There are significant cumulative impacts to water resources that the DEIS does not acknowledge nor propose mitigation. A cumulative impact assessment for water resources was not performed (see comment under "cumulative impact assessment"). EPA recommends an assessment of the cumulative impacts to water quality (coastal, surface, and groundwater), and on coral reef habitat, at a minimum.

CEQ guidance[32] on cumulative impact assessment focuses heavily on the use of scoping to identify resources of concern for analysis. In our scoping comments, EPA identified coral reefs, as well as water quality in relation to the aquifer, and emphasized the importance of assessing cumulative impacts, in general, due to the size of the project. The DEIS acknowledges that these resources were identified by stakeholders during scoping (Vol. 2, p. 4-72 and 11-56).

The following information should be considered in preparing an assessment of cumulative impacts for water quality and coral reefs for the FEIS.

1. Cumulative Impacts to Water Quality

Guam Water Quality Standards (WQS) and Total Maximum Daily Loads (TMDLs)

As the project will impact water quality, an assessment of cumulative impacts to water quality should be included in the DEIS. When assessing cumulative impacts, it is necessary to understand the existing condition of the resource to the extent that it represents effects from past actions. The condition of Guam's surface, ground and near shore water resources, as discussed in Volume 2, Chapter 4, does not identify the existing water quality problems identified in Guam's 2008 Integrated Water Quality and Assessment Report. This report identifies 54 water quality limited/impaired segments and the impacts this impairment could have on the military buildup activities. Impaired water segments do not meet Guam Water Quality Standards (WQS), which establish both the water quality goals for specific waters and the regulatory basis for treatment controls and strategies.

The Clean Water Act, Section 303(d) requires States and Territories to develop Total Maximum Daily Loads (TMDL) for listed water quality segments ("303(d) list") included in their Integrated Water Quality and Assessment Report. Guam EPA issued a public notice for draft bacteria Total Maximum Daily Loads (TMDL) for beaches in the central and northern areas of Guam. In addition to existing water quality impairment, the FEIS cumulative impact assessment should consider the implications of the TMDL process from a regulatory standpoint. Once EPA-approved, the TMDLs must be incorporated into a continuing planning process and loads allocated into EPA-issued permits. Key Guam and EPA programs that address water quality issues include:

- NPDES Permits and Section 401 Water Quality Certification

[32] *Considering Cumulative Effects Under the National Environmental Policy Act*, 1997 (CEQ Handbook), and *Guidance on the Consideration of Past Actions in Cumulative Effects Analysis*, 2005

- Individual Wastewater System Permits
- Stormwater Management, including permits
- Underground Injection Control (UIC)
- Coastal Nonpoint Source Programs and watershed implementation

The DEIS does provide some indications of existing water quality impairment in different chapters of the document, but they are not evaluated together in a cumulative impact assessment with a determination made of the magnitude and significance of cumulative effects on the resource (CEQ Handbook, Step 9). For example, the DEIS identifies contamination to nearshore waters from the Orote Landfill (Vol. 2, p. 4-54); states that domestic wastewater associated with population increase is the largest potential source of pollution to all waters of Guam[33] (Vol. 2, p. 11-11); cites urban runoff as one of Guam‘s most critical nonpoint source problems which impacts both groundwater and coastal waters (Vol. 2, p. 11-11), and documents continual erosion along the shoreline from the upstream side of nine bridges, with sediments containing heavy metals, such as copper and zinc, found in Agana (Hagatna) Bay (Vol. 2, p. 11-40).

Water quality impacts from munitions associated with the Mariana Islands Range Complex training around Guam should also be considered in the assessment of cumulative impacts to water quality. The MIRC DEIS identified the potential for contamination from munitions components including various explosives compounds such as ammonium perchlorate, picric acid, etc. and organic chemicals from underwater detonations, some of which are proposed to occur in nearshore locations. The MIRC DEIS stated that designated activity zones for underwater detonations would concentrate contamination.

Finally, climate change effects on water quality should be considered, including groundwater. Cumulative impacts from climate change on the freshwater lenses that are supplying drinking water in Guam may exacerbate conditions related to saltwater intrusion/freshwater transition zone, impact on groundwater recharge from changes in rainfall intensity, and the impacts on stormwater quality and infrastructure.

> *Recommendation*: EPA recommends that an assessment of cumulative impacts to groundwater and surface water quality be performed. The assessment should reference the impaired existing waters of Guam identified in Guam’s 2008 Integrated Water Quality and Assessment Report, TMDLs (existing or proposed) and how regulatory requirements associated with them may impact proposed military buildup alternatives. Cumulative impacts from climate change on water quality should be discussed. Potential mitigation measures for cumulative impacts should be identified as appropriate, to protect the waters of Guam and to ensure WQSs are met.

[33] Our significant concerns regarding wastewater contamination related to the project are identified in comments under "Wastewater"

2. Cumulative Impacts to Coral Reefs

We expressed serious concerns regarding the unprecedented loss of coral reef and related indirect impacts that would result from the CVN berth, as well as impacts to corals in the Haputo ERA (see coral reef impacts comment). Given these significant project impacts, it is especially important that cumulative impacts to coral reefs be assessed to provide information on the resource.

The assessment should identify cumulative impacts to corals within Apra Harbor, and for Guam. For Apra Harbor, the assessment should discuss historic loss of corals from past dredging, breakwall and wharf construction, runoff from increasing impervious surface area, and other historic modifications, as well as future dredging and fill for the commercial port and Navy operations. For Guam, discuss the historic loss of corals, including the significant decline of coral cover and recruitment since the 1960s as a result of natural and anthropogenic (human-induced) disturbances (Vol. 2, p. 11-13)[34] and identify whether these effects have been historically significant for this resource.

Additional stressors on corals should be identified, including: increases in domestic wastewater discharges, which can have significant anthropogenic impact on corals; sedimentation and stormwater discharge, which affects both coral cover and diversity (Vol. 2, p. 11-11); increased fishing pressure and recreational impacts on all coral reefs from increased population; and training-related impacts from MIRC, project-related, and other existing military training. Include a discussion on whether the resource is especially vulnerable to incremental effects, and whether it has the ability to withstand these stresses. Global climate change impacts should also be considered, since project impacts will increase stressors that further exacerbate climate change impacts on coral reef ecosystems[35].

> *Recommendation:* EPA recommends that the FEIS contain an assessment of the cumulative impacts to coral reefs, as identified above.

M. DREDGING ACTIVITIES AND SEDIMENT DISPOSAL

The discussions regarding dredging and dredged material management provide a reasonable, but general overview of existing sediment quality information and the potential impacts of dredging and disposal or reuse options. As the DEIS acknowledges, more specific sediment testing will be needed to support Marine Protection, Research and Sanctuaries Act (MPRSA) and CWA permitting. The permits will include more specific BMPs tailored directly to the details of the dredging projects that emerge from the NEPA process. We will work closely with the Navy, Guam EPA, and other federal and Guam regulatory and resource agencies to develop adequate sediment Sampling and Analysis Plans (SAPs) for Sierra Wharf and the CVN project, should these projects proceed as proposed.

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[34] The DEIS states that coral cover on Guam's forereef slopes has decreased from over 50% to less than 25%.

[35] See the NOAA website on Corals and the Threat of Global Climate Change at: http://www.ncdc.noaa.gov/paleo/outreach/coral/coralchange.html and the EPA report "Climate Change and Interacting Stressors: Implications for Coral Reef Management in American Samoa." 2007. EPA/600/R-07/069

1. Potential for Contaminated Sediments

The DEIS states that it is likely that all of the dredged material would meet the testing requirements for ocean disposal (Vol. 2. p. 4-48). However, EPA believes that a portion of the sediment to be dredged (especially from inner Apra Harbor in association with Sierra Wharf dredging) is likely to be contaminated enough to be unsuitable for ocean disposal[36].

Review of the sediment data in the DEIS was difficult, however, because the existing sediment quality data was not presented in a manner that makes it comparable and relevant to the specific dredging being contemplated at this time. For example, the sediment data tables for the 2006 sampling do not include all the sampling stations or composite areas relevant to the proposed Sierra Wharf dredging footprint (specifically, no data are presented for inner Apra Harbor Composite 7 in Table 4.1-3 in Volume 2). In addition, the "Tier III" results from the 2007 sampling (discussed in Volume 2, pages 4-48 through 4-52) cover a much broader area of inner Apra Harbor than the dredging area proposed for Sierra Wharf. However, the contemplated Sierra Wharf dredging footprint is not shown on the figures depicting the sediment sampling locations. (In fact the figures needed to consider Figure 2.5-3 and Figure 4.1-28 are separated by nearly 150 pages in Volume 2). Similarly, the EIS contains no figure showing the individual sampling locations or boundaries for 2007 sediment Composites C, D, and E, relative to the proposed dredging footprint. This is a particularly important omission, as the testing of these composites revealed much higher levels of contamination (and in one case some toxicity) than any other potentially dredged sediments discussed in the DEIS. EPA does not agree with the statement in the DEIS that all of the material from Composites C, D, and E would be considered suitable for unconfined ocean disposal (Vol. 2, p. 4-51).

Additionally, the data presented are only a snapshot of the sediment quality that may be expected, and only in certain areas of Apra Harbor. The Navy is likely to encounter a broader range of contaminants and contamination levels when future dredging projects and long-term maintenance dredging (discussed below) are considered. Based on the sediment testing data provided in Volume 2, section 4.1.4 of the DEIS, EPA's experience with past Apra Harbor dredging, and similar projects elsewhere in the Pacific, we believe that up to 20 percent of material to be dredged may be found to be unsuitable for ocean disposal when evaluated in accordance with the national sediment testing manual (*Evaluation of Dredged Material Proposed for Ocean Disposal - Testing Manual* [USEPA and USACE 1991]) and therefore require separate containment. Thus, we disagree with the statement that special handling of dredged material would not be required (Vol. 2, p. 4-48), and believe it is prudent for the DEIS to plan for special controls (for example, with respect to surface water runoff, or leachate to groundwater) which may be needed for particular upland placement sites.

> *Recommendation:* EPA strongly recommends that the FEIS include a more detailed upland/contained dredged material management strategy that seeks to maximize beneficial reuse of dredged material in light of all available placement options (including

[36] Such material, while perhaps not being so contaminated as to require active remediation or treatment, would nevertheless need to be managed at upland or contained sites that isolate the contaminants from aquatic organisms, surface and groundwater.

ocean disposal). Contaminated material should be managed to avoid mixing with less-contaminated sediments that may be suitable for a broader array of beneficial reuse options. This strategy should include identification of specific upland containment site(s) whose capacity would be set aside specifically for dredged material determined by the Corps and EPA to be unsuitable for unconfined ocean disposal. In addition, EPA recommends the FEIS should take a conservative approach with respect to the capacity and quality of dredged material that the upland containment site(s) may have to accommodate from the proposed dredging events as well additional dredging (e.g., periodic channel maintenance) expected to occur within the foreseeable future (e.g., 10-15 years). For the specific location(s) identified, the FEIS should describe any appropriate engineering controls, (such as impermeable liners, etc.) needed to properly manage the relevant site-specific contaminant exposure pathways (including any sensitive surface or groundwater resources, etc.), and anticipate the need for a closure plan and environmental monitoring.

EPA also recommends the Navy consider identifying different disposal sites based upon the physical qualities of dredged material. For example, fine versus coarse material presents different challenges in terms of water management (ponding, drying time) as well as suitability for the range of reuse options. Additional capacity may be needed at upland containment site(s) to manage uncontaminated, finer material during the drying process. Alternatively, if the options for reuse of finer material turn out to be particularly limited on Guam, this finer material may be some of the higher priority material to consider for confined ocean disposal.

Based on the above, the FEIS should re-evaluate the capacities of the various potential upland placement sites to manage multiple "streams" of dredged material over the long-term. Specifically, the capacity remaining at other upland sites (after subtracting capacity dedicated to contaminated sediments or for fine-grained sediments) should be re-calculated as this will provide a better basis for estimating quantities of dredged material that may be suitable for ocean disposed over time (see "Dredged Material Management Scenarios" comment below).

2. Identifying Radioactive Contamination in Apra Harbor Sediments

DoD should summarize past radioactive survey data for Apra Harbor sediments and describe project-specific sediment characterization protocols for potential radioactive contaminants in areas of Apra Harbor utilized by nuclear powered vessels. EPA is aware that the Navy conducts surveys to detect radioactive contamination in Apra Harbor due to the presence of military nuclear facilities. Although radioactive materials have been released from military facilities into Apra Harbor, the DEIS lacks a discussion of how past military activities may have contaminated sediments in Apra Harbor proposed for dredging as part of the project. Dredging materials should be evaluated before they are stockpiled or used for construction activities to ensure nearby receptors are not exposed to excessive levels of water and airborne radionuclides. Accordingly, EPA sets National Emission Standards for Hazardous Pollutants (NEHAPS)[37] for

[37] More information on NEHAPS can be found at: http://www.epa.gov/enviro/html/rad/rad_subpart_i.html

certain federal facilities to protect the public from radionuclide exposure of greater than or equal to (?) 10 millirem per year (Clean Air Act, 40 CFR Chapter 61 Subpart I). Sediment characterization sampling and analysis should include radionuclides where appropriate.

> *Recommendation* : A summary of past radioactive survey data should be included in the FEIS. Relevant CAA requirements and DoD measures to meet NEHAPS should be described for activities in Apra Harbor. Project-specific sediment characterization and handling protocols should be provided to avoid radionuclides exposure.

3. Sufficient Planning for Beneficial Reuse of Dredged Sediments Not Demonstrated

The DEIS states that beneficial reuse projects are the preferred alternative for dredged material disposal (Vol. 2, p. 8-42); however, to date there has been limited discussion of specific beneficial reuse options and little evidence that specific planning is occurring to maximize these opportunities. The DEIS identifies three potential projects for beneficial reuse: (1) support stabilization below the CVN wharf; (2) berms at proposed military firing ranges; and (3) Guam's commercial port expansion (Vol. 2, p. 2-92). (The Guam commercial port expansion will require separate NEPA review and is unlikely to occur in the project time frame.) Reuse as landfill daily cover, an ongoing daily need for six inches of earthen material (Vol. 6, p. 5-3), is mentioned but not discussed although Appendix D identifies this as a viable reuse option (p. D-12). Similarly, construction material for roads or other project sites is not explored, despite the need for fill on a number of sites[38], including munitions storage construction and fill which Appendix D also identifies as viable.

A wider range of potential reuse options should be considered[39]. These should include using coarser dredged material as an aggregate source for concrete, and storage (stockpiling) for future reuse. Stockpiling eases planning or permitting complications when dredging and re-use projects (such as fill needs elsewhere) don't coincide. Of course, stockpiled material should not completely fill all available upland capacity at any time, particularly when additional dredged material placement (from ongoing dredging projects) is expected to occur. However, the upland/contained dredged material disposal strategy EPA recommends above should assist planning by identifying how much space overall could reasonably be set aside for stockpiling. We recognize that double handling from stockpile areas greatly increases overall costs; however, reusing stockpiled material would require less importation of base material, may be less damaging when other sources would cause significant environmental impact (for example at a new excavation site, or from hauling large volumes of material by truck through sensitive areas), and where cost-sharing arrangements can be made, may be considered practicable. As the DEIS acknowledges, on a project-by-project basis, EPA and USACE will not approve ocean disposal if less environmentally damaging practicable alternatives to ocean disposal are available.

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[38] For example, relocating Route 15 will require between 65,000 cubic yards (cy) and 1.7 million cy of fill (depending on the alternative)(Vol. 2, p. 4-83) and the USCG Building Relocation 9,809 cy of fill (Vol. 2, p. 2-100).
[39] Additional options for the planning and financing of beneficial use of dredge materials can be found at "Identifying, Planning, and Financing Beneficial Use Projects Using Dredged Material - Beneficial Use Planning Manual" (EPA842-B-07-001).

Recommendation: The FEIS should discuss additional beneficial reuse options in more detail. We suggest preparing a list of foreseeable projects requiring fill and the estimated volume and timeframe, so that dredging and reuse projects can be coordinated. Landfill daily cover should be included in this list. We recommend upland storage (stockpiling) of suitable material for future reuse projects, as well as determining whether some or any of the coarser dredged material (including that already present in existing upland placement sites) can be reprocessed to make aggregate for concrete production for Navy or civilian construction projects on Guam. Reuse of dredged material for berms at new firing ranges (160,000 cy) should also be included.

4. Dredged Material Management Scenarios Unrealistic

The four dredged material management scenarios presented in the DEIS (100 percent upland placement; 100 percent beneficial reuse; 100 percent ocean disposal; and approximately 25 percent beneficial reuse plus approximately 75 percent ocean disposal) are not well supported and may be misleading for planning purposes (Vol. 2, p. 4-88). We recommended the Navy develop a more detailed upland/contained dredged material disposal strategy that combines these various disposal methods (as well as interim stockpiling) that reflects the projected needs for re-use of suitable material and estimated percentage of material expected to be unsuitable for beneficial re-use. This strategy should be based on more specific estimates of the capacity for direct reuse or upland stockpiling for future reuse, and the remaining proportion of material that may require ocean disposal When these factors are considered, it is likely the fourth management scenario will need to be revised to reflect that a higher percentage can be reused/stockpiled, and a lower percentage would require ocean disposal.

Recommendation: For planning and disclosure purposes, the FEIS should include a new intermediate overall dredged material management scenario, or revise the existing intermediate scenario. If a single, revised scenario is presented, EPA recommends that it reflect no less than 50 percent going to beneficial reuse (including stockpiling for future reuse (including 20 percent estimated for upland containment disposal), and no more than 50 percent being proposed for ocean disposal.

5. Future Maintenance Dredging Needs Not Evaluated

The DEIS does not estimate future maintenance dredging needs, either in terms of potential future dredging volumes, or potential sediment quality.

Recommendation: The FEIS should present an estimate of future maintenance dredging frequency, volume, and sediment quality, at a minimum for the newly deepened channel and berth areas proposed for the CVN and Sierra Wharf projects. Based on the sediment testing data provided in Volume 2, section 4.1.4 of the DEIS, EPA's experience with past Apra Harbor dredging, and similar projects elsewhere in the Pacific, EPA recommends using the same proportion discussed above; namely, to assume (for planning purposes) that up to 20 percent of the volume dredged may not be suitable for ocean disposal and would therefore require upland disposal or contained re-use.

6. Minimizing Direct Impacts of Dredging Operations.
For comments on engineering and operational dredging BMPs specifically intended to protect aquatic resources, please refer to our previous CVN comments under "Water Quality – Section 230.10(b)".

II. AIR QUALITY IMPACTS

A. General Conformity Applicability Analysis
EPA has reviewed the General Conformity applicability analysis and has attempted to identify the assumptions and methodology used, however the analysis consists largely of a series of tables with no accompanying explanation, therefore it is difficult to definitively confirm that the analysis has considered all emissions. For example, it appears that the list of construction equipment to be used on the Main Cantonment site assumes one piece of each type of construction equipment, and no explanation is provided as to how this was determined. While only a portion of the main cantonment site is in the nonattainment area, an explanation of how only one chainsaw, for example, would be expected to be used, would be helpful.

Another uncertainty is the incorporation of the high sulfur fuel in the calculations. We understand that the inputs to the NONROAD and MOBILE 6 models were modified to use the highest sulfur content fuel input available in the model (Vol. 2, p. 5-15), however the maximum value in these models is 0.5% sulfur, and the DEIS states that the current fuel content on the island is 0.6% (Vol. 6, p. 7-18). Some clarification is needed to explain how this does not underestimate emissions. Elsewhere, emissions calculations for the NONROAD model are described as using national default model inputs (Vol. 6, p. 7-9).

Another uncertainty is the dredging equipment included in the analysis and the hours estimated for dredging, since these figures do not match the equipment list and hours estimated in the CVN Berth Volume 4 Sect. 2.5.3. For example, Vol. 4 p. 2-41 and 2-43 identify additional equipment to be used for dredging, and indicate that dredging will occur 24 hours a day for 6-9 months or could go 8-18 months. The general conformity table identifies a smaller equipment list and lists 19 weeks for dredging.

Finally, the general conformity analysis does not include emissions from the increased maritime traffic to the commercial port transporting project-related construction and operation materials into Apra Harbor. During a teleconference, DoD informed us that this was outside of their control[40], and therefore exempted from the analysis, however, EPA believes that all environmental impacts resulting from the project should be analyzed.

> *Recommendation:* Provide a clear list of all the activities that were determined to take place in the Piti and Tanguisson nonattainment areas and were thus the basis for calculating emissions for comparison to de minimis levels for these areas. Provide an explanation for Tables I.3-227 through I.3-254 that shows emissions calculations.

[40] We note that DoD claims that they can control the construction tempo and resulting population growth; indeed this is the very basis for the adaptive management strategy identified in the DEIS.

Explain how the equipment list, number of units, and usage factors were determined. Explain how the calculations, including the emission factors, incorporate the high sulfur fuel for each category and are sufficiently conservative to capture the current fuel content. Identify the assumptions made regarding age of construction equipment and if this would bear on emissions, how this is captured in the analysis. Explain how estimates for dredging were calculated and what the assumptions were, especially the equipment list and how this relates to the equipment listed in Volume 4 for dredging (Sect. 2.5.3), and the hours and duration of dredging. Estimate the increased maritime traffic to the commercial port directly related to transporting project-related construction and operation materials into Apra Harbor for distribution and include emissions estimates in the applicability analysis.

B. Interim Power Generation

1. Permitting Requirements

The DEIS states that no permitting actions will be required for the refurbishment of combustion turbines at four Guam Power Authority (GPA) facilities for the preferred alternative because the limit on hours of operation in the title V permits for these facilities will not be exceeded, even with increased utilization of the turbines[41]. However we believe that given the age of these turbines, the refurbishments may constitute "modifications" that will require an evaluation of the potential emission increases. An operating increase of as little as 350-500 hours/year could be significant enough to require a Prevention of Significant Deterioration ("PSD") permit action, which would present significant timing challenges that DoD has not considered in the DEIS. If permitting is triggered, GPA may be in non-compliance if they modify the combustion turbines without the necessary permits. Therefore DoD may have to find other sources of power that have not been discussed in the DEIS depending upon permitting timelines.

The key question is whether the refurbishment qualifies as routine maintenance, repair, and replacement, which by rule are excluded from triggering a PSD modification. These refurbishment projects must be analyzed on a case-by-case basis to determine whether they qualify as routine maintenance. In accordance with current Agency policy, this analysis would be based on considerations of the nature, extent, purpose, frequency, and cost of the projects.

We note that title V and PSD are two different permitting programs with different permit modification criteria. The fact that GPA may not need to seek title V permit revisions to increase allowable hours of operation under Interim Alternative 1 has no bearing on whether any of the projects would trigger the "major modification" requirements under the PSD regulations. If EPA determines that any of the turbine refurbishment projects does not constitute routine maintenance, and if any such modification would result in a significant net emissions increase as determined in 40 CFR 52.21, the project would require a PSD permit prior to the commencement

[41] The DEIS states that the turbine at a fifth GPA plant, Dededo No. 2, has already been refurbished. However Guam EPA informed EPA Region 9 by telephone on December 10, 2009 that this work has not been done yet. At this stage, it is our understanding that GPA is still in the process of selecting a vendor to assess the turbine and make the necessary modifications. Thus our comments about possible PSD applicability also apply to the Dededo turbine.

of any refurbishing activities. The PSD permit issue explained above may also exist for Interim Alternatives 2 and 3 which the DEIS states would require permit modifications. Regardless of the necessity of any title V permit revisions, these projects could require a PSD permit and must be evaluated on a case by case basis in order to make this determination.

In addition, it should be noted that EPA has recently proposed a PSD/Title V Greenhouse Gas Tailoring Rule, which may affect this project. Under this proposed rule, if adopted, new facilities emitting over 25,000 tons of greenhouse gases a year would be considered subject to the PSD requirements and therefore required to demonstrate that the best available control technology is used to minimize greenhouse gas emissions. Also, as proposed, existing major sources that are modified such that greenhouse gases increase significantly would also have to meet the PSD requirements.

2. Inadequate Impact Assessment

In addition to the potential permit requirement, the impact assessment for air quality impacts from increased operation of the CTs is insufficient. The DEIS dismisses increases in emissions of both criteria pollutants and hazardous air pollutants[42] (HAPS) from the CTs because these facilities, while currently out of service (Vol. 6, p. 2-9), are already permitted to operate for the hours that will be required, and that compliance with air quality standards has already been demonstrated during the permitting process for these facilities. This is an invalid measure for air quality impacts. These facilities are permitted under the title V operating permit program, which is not a pre-construction review program, thus the air quality impacts were not evaluated during the permitting process. As written, the impact assessment methodology that does not disclose emissions that will occur as a result of the project.

A more appropriate impact assessment methodology should be utilized, specifically one that considers human health. For example, since the CTs are not currently used, the assessment should predict the emissions that would be expected from the operation of the CTs. The emission estimates could be modeled to predict pollutant concentrations and exposures for nearby residents. The pollutant concentrations could be compared to a health-based standard, such as the NAAQS or an occupational health standard. Because of the potential for PSD permitting, DoD may also want to compare the modeled pollutant concentrations to PSD increments.

The impact assessment should also evaluate increased emissions exposures from HAPS as a result of CT operations. The DEIS does not disclose actual HAPS emissions that would occur for preferred Interim Alternative 1. Only Interim Alternatives 2 and 3 are disclosed and only the fraction of emissions associated with hours above the permitted hours, and none are evaluated for health impacts.

[42] Toxic air pollutants, also known as hazardous air pollutants, are those pollutants that are known or suspected to cause cancer or other serious health effects, such as reproductive effects or birth defects, or adverse environmental effects (http://www.epa.gov/ttn/atw/allabout.html#what).

The EIS should also discuss increases in emissions in locations where sensitive receptors may be exposed to multiple project sources, such as significant traffic congestion, major construction sites, and CTs. For example, residential receptors proximate to the Dededo and Macheche CTs will also experience impacts from significant traffic congestion along the Guam Road Network in the construction phase (Vol. 6, Figure 4.2-4), and potentially beyond. The combined pollutant exposures from these sources could be significant.

> *Recommendation:* The FEIS should disclose the actual emissions increases that would occur as a result of the military build-up. An analysis of the increase in actual emissions and resulting air quality impacts to human health should be included in the FEIS. A discussion of health impacts from multiple sources should occur at least qualitatively.
>
> For significant impacts from criteria pollutants, mitigation measures should be identified. The DEIS identifies possible mitigation for CT emissions, which include the addition of pollution control equipment to reduce emissions at the CTs, and the burning of low sulfur diesel fuel in the CTs (Vol. 7, p. 2-53). We recommend that DoD discuss the necessary resources needed to ensure that GPA can implement measures to mitigate air quality impacts from CT emissions, especially for those CTs near residential populations. DoD should consider how it could assist GPA to implement these measures, including building the capacity of GPA to implement energy efficiency programs which could negate the need for new power sources.
>
> The FEIS should identify the potential PSD permitting requirement discussed above and state that EPA needs more information from GPA before EPA can determine whether refurbishment would qualify as routine maintenance. Additional information regarding turbine refurbishment should be included in the FEIS if known. Should PSD permits be required, the FEIS should discuss the process and timing for securing permits and how this may affect the construction time line and availability and reliability of power for the Guam population.
>
> We also recommend a quantitative stationary source air toxics analysis be performed for the 4 or 5 CT locations. If impacts are significant, a full quantitative dispersion analysis of air toxics impacts from the CT facilities should be conducted. This information should be used to determine which interim alternative most avoids impacts to residential receptors. For example, the Dededo and Macheche CTs are in closer proximity to residential receptors than Orote and Yigo. This impact avoidance evaluation should be described in the FEIS.

C. Lack of commitment to energy efficiency, renewable energy, and cleaner fuels

<u>1. Long-term Power Supply</u>

EPA reviewed the early release DEIS as part of our cooperating agency review and provided a number of suggestions regarding renewable energy and energy efficiency. We pointed out the unique opportunity this project offers for DoD to achieve the goals pursuant to the government's renewable energy policies, including the Energy Policy Act and Executive Order (EO) 13423[43]. The long-term energy alternatives proposed in the DEIS; however, indicate that these opportunities are not being pursued. The Draft EIS does not address energy efficiency opportunities on the island that could reduce demand and potentially provide the needed capacity for the project, and dismisses a number of renewable energy options largely because they cannot provide 100% base load power. Instead, the long-term power alternatives include constructing a new power plant either at Cabras/Piti or at a new location at Potts Junction, which would likely utilize either No. 6 for baseline power and No. 2 oil for peaking, or liquefied natural gas (LNG). The DEIS does not evaluate impacts from these long-term alternatives, stating they are treated programmatically in the DEIS, and future NEPA documentation will occur if necessary.

However, the long-term power alternative, which is referenced in the DEIS as providing the power source for the project, is currently being pursued by Guam Power Authority (GPA), per their Integrated Resource Plan (IRP)[44]. GPA confirmed that the military build-up will necessitate that this new power capacity be implemented approximately 5 years earlier than would have otherwise been necessary, and that they expect the new power plant unit to be brought on-line in 2017[45], not 2015 as the DEIS states. Since this expedited project is in response to the military build-up, environmental impacts from this power project should be disclosed in the FEIS.

More significantly, it does not appear that DoD's plans for short and medium-term power for the project are consistent with the goals in Guam Power Authority's (GPA) Integrated Resource Plan (IRP). GPA's IRP recommends switching from diesel fuel oil to liquefied natural gas (LNG) by 2012[46]. GPA also has a strong desire to convert the CTs to natural gas, and the proposed project provides the opportunity for converting the CTs to run on either natural gas or lower sulfur fuel.

> *Recommendation:* While we recognize that there are potentially significant obstacles to implementing LNG, GPA appears open to the utilization of cleaner fuels. DoD should work with EPA and GPA to pursue cleaner fuels for both the long-term power plant and short-term operation of the CTs. For NEPA disclosure, the FEIS should also be updated to reflect the longer duration of CT operation and emissions (until 2017 instead of 2015), and include impacts from this 80MW power unit, since it is occurring during the project implementation phase.

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[43] The EO 13423 Implementation Instructions identify strategies and tools each agency shall use to meet the goals of the order. Funding is one such tool, and the Implementation Instructions state that appropriated funds may be combined with Utility Energy Service Contracts (UESCs) to leverage government funding and optimize project scope and reductions in energy use and cost of facility operations. (See http://www.fedcenter.gov/_kd/Items/actions.cfm?action=Show&item_id=6825&destination=ShowItem)

[44] GPA's Integrated Resource Plan is available at: http://www.guampowerauthority.com/gpa_authority/strategicplanning/gpa_strategicplanning_FY08IRPDraft.php

[45] Based on a telephone conversation with GPA on 12/14/2009.

[46] GPA's IRP outlines the need for a new power plant due to the military buildup. A primary recommendation indicated in GPA's IRP is to "Plan and permit for an additional gas-fired plant or non-petroleum-fired plant as a hedge for the uncertainty in the scope of the DoD buildup and related economic activity — Guam Power Authority (GPA) should construct this plant based upon high load growth triggers and work with the DoD to mitigate rate impacts to other customers"(Executive Summary, p. I).

EPA continues to believe that implementing energy efficiency measures and utilizing renewable energy could potentially negate the need for an additional power plant (see below). In addition, if cleaner fuels are utilized at the existing power plants, there is a lower likelihood of PSD permitting requirements, and the number of pollutants that could potentially trigger PSD review will likely be reduced.

2. Comprehensive Energy Plan

As a potential mitigation measure, the DEIS states that DoD would assist Guam to develop a comprehensive energy management plan (Vol. 7, p. 2-26) in close coordination with GPA, that will focus on reducing the energy footprint of DoD infrastructure (Vol. 6, p. 3-39). The DEIS cites interest for this plan by several federal agencies. We strongly support DoD's efforts for on-base energy efficiency as outlined in the DEIS, however, since GPA provides all power to the island, efforts to increase energy efficiency need not be limited to DoD facilities since off base efficiencies may provide the extra capacity needed for DoD's power needs. Therefore, a comprehensive island-wide energy plan, which includes energy efficiency, renewables, and cleaner fuels, is appropriate. GPA's IRP would be a valuable starting point and contribution to a joint comprehensive strategy.

Recommendation: EPA supports a comprehensive energy plan and we have interest in continuing to work with other federal and local agencies and utilities to create a clean, efficient, and sustainable energy program for Guam. We recommend a formal relationship be established for ongoing coordination, such as a Memorandum of Agreement (MOA) between DoD, GovGuam, GPA, Department of Energy, Department of Interior, U.S. Department of Agriculture Rural Development, and EPA. This MOA could identify concrete goals and create a mechanism to ensure coordination and economy of effort. For example, there may be opportunities for DoD, GovGuam, and DOE to partner together to ensure that monies are spent on energy efficiency practices that would reduce demand the most. We recommend that DoD establish this agreement to demonstrate its commitment to this particular mitigation measure (Vol. 7, p. 2-26), and the government's renewable energy policies in general, including the Energy Policy Act and Executive Order (EO) 13423. This commitment should be documented in the FEIS and ROD.

The following are suggested elements of a comprehensive energy management plan:

Energy Efficiency: Island-wide energy efficiency opportunities should be explored first. Substantial energy savings can occur while simultaneously improving the quality of life and health of the people of Guam. Energy efficiency programs can generate significant reductions in energy demand [47], and in combination with renewables, may negate the

[47] Examples of energy efficiency improvements that could be implemented on the island include a Cool Roofs program and Refrigerator switch-out programs. Cool roofs consist of materials that reflect the sun's energy from the roof surface, thereby reducing the need for air conditioning. Energy savings using cool roofs are significant; a 3,000

need for a new power plant. An island-wide energy audit can identify the most accessible and cost-effective opportunities to reduce island-wide energy. Energy efficiency practices will be implemented on Guam through the American Recovery and Rehabilitation Act's (ARRA) grants programs. Under ARRA, Guam received approximately $30 million for projects that reduce total energy use and fossil fuel emissions, and improve energy efficiency (through three grant programs: State Energy Program Formula, Weatherization, and Energy Efficiency and Conservation Block Grant Program). The energy audit could predict the reductions in demand that would occur from these grant programs.

Should DoD provide resources for such an effort, EPA could potentially assist with the energy audit, along with the US Department of Energy's (DOE) National Renewable Energy Laboratory (NREL). NREL is the nation's primary laboratory for renewable energy and energy efficiency research and development. NREL could not only assist with the energy audit, but could also provide expertise regarding which emerging technologies appear most feasible for Guam. For example, there are new developments in solar technology that are most amenable to Guam's weather patterns (i.e., high winds).

Solar Energy Potential: A thorough review of solar energy potential should occur, including an assessment of the land and rooftop area on proposed and existing military structures, and island-wide potential for solar energy utilizing a roof leasing arrangements[48]. The DEIS acknowledges that solar energy could be used to supplement baseload power (Vol, 6, p. 2-15) but dismisses large scale photovoltaics, stating that large land or large rooftop areas are required for panel installation. Existing DoD solar projects in Hawaii have proven feasible and cost effective.[49] With an integrated energy strategy, it is not necessary to have 100% energy generated from solar sources; thus the potential for solar energy can be explored.

Wind Energy Potential: DoD, in conjunction with GPA, should conduct a thorough review of wind energy potential on the island. The DEIS eliminates consideration of wind energy in the DEIS for various reasons (Vol. 6, p. 2-10), however, GPA's IRP identifies wind energy as a "renewable resource of choice in the near term". The IRP discusses the need to conduct further wind studies at specific locations, and cites conversations with DoD indicating that "it is conducting wind studies at specific

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sq ft roof could save around 6,600 kWh per year on average. Refrigerator switch-out programs for aging and inefficient refrigerators could also significantly reduce energy usage.

[48] This is proving successful in California. The California utility, Pacific Gas and Electric, has successfully implemented a leasing program for solar installation consisting of up to 250 MW of utility-owned PV generation and an additional 250 MW to be built and owned by independent developers under a streamlined regulatory process. Projects developed by independent parties would be offered a standard contract and pricing derived from the utility's own costs to streamline review of their applications. For more information, see: http://www.pge.com/about/news/mediarelations/newsreleases/q1_2009/090224.shtml

[49] See "Solar America Showcase" in Forest City, Hawaii: http://www1.eere.energy.gov/solar/pdfs/forestcity_factsheet_20081113.pdf

locations on its properties, and wishes to work collaboratively with the Authority."[50] The Navy recently applied for a $16 million grant under the Energy Conservation Investment Program to install four turbines on Naval Munitions Site, which, if awarded, could provide valuable wind data. With an integrated energy strategy, it is not necessary to have baseload power generated from wind sources; thus the potential for wind energy can be explored. This exploration should include an assessment of feasibility and potential output, and would assess the potential impact of wind turbines on endangered species and their habitat.

3. Transportation and construction fuels

The DEIS dismisses the use of lower sulfur fuels for transportation and construction, and cites the 2006 EPA-issued partial waiver to Guam that conditionally exempts Guam from the requirements to use low sulfur fuels in its power plants and in gasoline that is used island-wide in vehicles (Vol. 6, p. 7-3)[51]. We note that this decision by EPA was made based on existing environmental conditions on Guam and included economic considerations; it did not foresee the substantial changes to population and emissions activity that the project proposes. In addition, the DEIS is not correct in stating that EPA could cancel the waiver (Vol. 7, p. 2-53). GovGuam must request cancellation of the waiver for EPA to take action.

The DEIS recognizes that the use of cleaner fuel types would likely be required to prevent the occurrence of significant air quality impacts (Vol. 6, p.19-5). We understand DoD is currently exploring options to bring ultra low sulfur diesel to the island due to the fact that newer highway diesel engines (US-manufactured 2007 model year or newer) will be inoperable without it[52]. However, the DEIS assumes that ultra low sulfur diesel will not be utilized for the military buildup. Our concern about the current lack of ultra low sulfur diesel lies in the potential health impacts from increases in project-related transportation, the significant traffic congestion predicted to occur at 24 to 30 intersections at peak hours (Vol. 6, p. 4-168), and the collective impacts from mobile sources, construction equipment, and operation of the CTs, many of which are near sensitive receptors. EPA believes that these collective air quality impacts are potentially significant, that they should be analyzed, and that a substantial mitigation effort is warranted, especially since these impacts will fall disproportionately on environmental justice populations.

In addition, since Guam has two areas that are in nonattainment for the sulfur dioxide National Ambient Air Quality Standard (NAAQS), these increases in fuel use could contribute to or expand the areas in Guam where these health-based air-quality standards are not met. EPA is currently reviewing the existing sulfur dioxide standard and expects to soon take final actions that could lead to a lower, more protective standard. Should DoD not pursue clean transportation and construction fuels, they will likely contribute to expanded areas of degraded air quality that does not meet health-based air quality standards. (See more in monitoring comment below)

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[50] Guam Power Authority, FY 2008 Integrated Resource Plan, p. 13-2.
[51] We note that this waiver also applies to diesel fuel.
[52] Based off of a phone conversation with the Defense Logistics Agency's Defense Energy Support Center on January 5, 2010.

Recommendation: EPA has significant concerns regarding impacts to air quality and human health and we agree with the assessment in the DEIS that states that cleaner fuel types would likely be required to prevent the occurrence of significant air quality impacts (Vol. 6, p.19-5). Because of the magnitude of this project and the vulnerabilities of the local Guam population which is disproportionately underserved and socio-economically impacted, it is strongly advised that DoD develop a program to introduce ultra-low sulfur fuel to the island, which would significantly reduce the public health impact of the build-up. We recommend that this program be discussed in the FEIS and that DoD commit to use ultra low sulfur fuel. Diesel fuel with a sulfur level of 10 ppm is currently available from Japan[53].

It is possible that DoD's use of ultra low sulfur fuel could affect demand on the island in such a way that the local fuel suppliers would begin providing the entire island with this fuel. In this way, DoD's actions could provide the impetus for a significant environmental and public health improvement on Guam.

D. No Alternative Fuels Strategy Identified

The DEIS references pollutant reductions that would be achieved as a result of the Energy Independence and Security Act (EISA) of 2007 (Vol. 2, p. 5-6), because this act includes sections to reducing petroleum use and increase alternative fuel use, including:

- Only acquiring any light-duty motor vehicle or medium-duty passenger vehicle that are "low greenhouse gas emitting vehicles" or demonstrating that cost-effective policies have been adopted to reduce petroleum consumption sufficiently to achieve a comparable reduction in greenhouse gas emissions.
- At least a 20% reduction in annual petroleum consumption and a 10% increase in annual alternative fuel consumption by 2015 from a 2005 baseline. Interim milestones will be established.
- Installation of at least one renewable fuel pump at each Federal fleet fueling center by 2010.

There are no elements of the proposed actions that would advance these goals, so it is unclear why pollutant reductions in relation to the EISA are referenced.

In the DEIS, alternative fuels are excluded as a power generation option because "There is no source of bioenergy (crops) on Guam, fuel cost is higher than diesel fuel or heavy fuel oil currently used, and conversion technology is similar to current generation (no technology

[53] EPA's current diesel fuel standard is 15 ppm for highway vehicles, and 500 ppm for nonroad, locomotive, and marine (NRLM). The 500 ppm standard applies to the fuel being used by the project's construction equipment. US refiners will be required to start producing 15 ppm ULSD for NRLM beginning on June 1, 2010, and the switch to sulfur sensitive technologies for non-road engines and equipment will occur in 2011. Given the timing of the military buildup, we are calling for a commitment to use ULSD in diesel non-road and highway vehicles.

advantage).” (Vol. 6, p. 2-10). The DEIS does not evaluate bioenergy for transportation fuels, despite EPA's recommendations to do so[54].

> *Recommendation:* Consistent with the alternative fuel vehicle goals set forth in the Energy Policy Act of 2005 and with the Navy’s existing B-20 standard, we continue to recommend further analysis of biodiesel as an alternative fuel. Used cooking oil is a source of biodiesel that has been overlooked, with approximately 1 million tourists visiting the island annually, and some 140 restaurants operating in Guam, with this number likely to increase. As we previously commented in our scoping comments and on the early release DEIS, Hawaii has been very successful in implementing a biodiesel program. Based on our research on a similar facility in Maui, Hawaii,, a small 250,000 gal/year biodiesel facility is feasible for Guam. A facility of this size could be constructed on less than 1 acre of land for approximately $1 million. In addition there is currently a small biodiesel facility operating on Guam. It should also be noted that Guam EPA is interested in conducting a biofuel project and has stated that due to the abundance of palm trees on the island, there is potential to conduct a pilot utilizing this resource[55]. This may present an excellent partnership opportunity for DoD and one that would allow DoD to adopt one or several alternative fuels initiatives for their fleet.

E. Mobile Source Air Toxics - Air Quality and Health Impacts

The construction phase of the project will result in a significant increase in population and construction-related vehicles, and the evaluation of traffic impacts in the DEIS shows substantial traffic congestion during the construction phase, as well as the build-out phase (Vol. 6, Table 4.2-34). This will result in an increase in emissions of mobile source air toxics (MSAT), compounds that are emitted from vehicles and heavy equipment which are known or suspected to cause cancer or other serious health and environmental effects. These impacts are especially of concern on Guam due to the island’s exemption from current low-sulfur fuel requirements. Because high-sulfur fuels are used on Guam, the emissions and public health benefits of low-sulfur fuels (reduced particulate matter and other air toxics emissions) are not realized.

During our cooperating agency review of the early release DEIS, EPA recommended performing a quantitative analysis of MSATs from construction and operational emissions, for the purpose of estimating human health impacts, given the project’s potential for emissions in close proximity to residential communities. The air quality analyses in the DEIS continues to state that a quantitative assessment of the effects of air toxic emission impacts on human health cannot be made at the project level[56] (Vol. 6, p. 7-4 to 7-5; 7-30 – 7/33), and EPA continues to disagree given the fact that there are a suite of tools available, as well as examples of real-world applications of these tools, that can be utilized to conduct the assessment (see recommendation below). Therefore, the evaluation of MSATs in the DEIS remains deficient.

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[54] EPA’s scoping comments May 21, 2007; EPA’s comments on the draft Description of Proposed Action and Alternatives (DOPAA), May 15, 2008; EPA’s comments on the early release DEIS, August 25, 2009.

[55] It is important to note that a palm tree pilot would need to be conducted in a sustainable way to reduce impacts to environmental resources.

[56] The DEIS refers to the February 2006 FHWA Interim Guidance on Air Toxics Analysis in NEPA Documents which describes when and how to assess MSAT impacts for transportation projects during the NEPA process.

However, the DEIS states that additional MSAT analysis will be performed given the unusual scale of the proposed relocation as compared to other Navy actions, per our recommendation, and will be presented in the FEIS (Vol. 6, p. 7-4). We appreciate DoD's willingness to perform a quantitative MSAT analysis in response to our recommendation. An analysis of potential MSAT impacts would provide information useful for informing the design of the Guam Road Network (GRN) or other project components at the microscale. The analysis would identify where MSAT "hot spots" are likely to occur and could be used to evaluate the effectiveness of potential design changes of the GRN in avoiding human health impacts by reducing emissions or exposure to emissions from project construction and operations. For example, if a road widening project would produce a hotspot near a school, playground, or other sensitive receptors, efforts to either modify the project (such as creating a buffer or shifting the alignment away from the children) or otherwise mitigate exposures to children could be explored. In this way, a quantitative MSAT analysis can inform design decisions and mitigation opportunities. EPA's May 29, 2009 NEPA/Clean Air Act Section 309 Diesel Emissions Guidance provides some examples of ways to avoid or minimize human exposure to emissions from federal actions. While the document is tailored to diesel emissions, the mitigation measures discussed are applicable and appropriate to MSATs in general.

> *Recommendation:* For the purpose of identifying public health impacts, EPA recommends performing a quantitative analysis of construction and operational emissions for the six MSATs most likely to be significant: diesel particulate matter, acrolein, acetaldehyde, formaldehyde, benzene, and 1,3-butadiene for the base year, peak construction year, and the final build year for those roadway projects and impacted areas neighboring sensitive receptors and residential communities. Regarding methodology, EPA identified several examples of quantitative MSAT analyses in the context of NEPA in our previous comments[57]. We also recommended consulting the methodology described in the research report "*Analyzing, Documenting, and Communicating the Impacts of Mobile Source Air Toxic Emissions in the NEPA Process*" prepared for the American Association of State Highway and Transportation Officials (ASHTO). Per our conversation on January 19, 2010 with FHWA and their contractor, we understand that DoD is proposing a substantial MSAT analysis. EPA appreciates DoD's willingness to involve us in the identification of the methodology and thanks DoD for giving us an opportunity to provide feedback on a proposed scope of work. As the MSAT analysis methodology is finalized, DoD should continue to consult with EPA on the applicability of these examples to analyses developed for the FEIS.
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> The results of the MSAT analysis should be reviewed in conjunction with the air toxics impacts from operation of the 4 or 5 combustion turbines. For areas identified as having greater emissions exposure, we recommend a review of the GRN and interim power alternatives to identify whether design changes are possible to reduce human exposures to

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[57] Examples include the October 2006 China Basin Shipping DEIS, (http://www.portoflosangeles.org/environment_pn_deir_cs.htm) and the May 2009 Schuyler Heim Bridge Replacement and SR-47 Expressway Project EISs (http://www.dot.ca.gov/dist07/resources/envdocs/)

these pollutants. For example, the Dededo and Macheche CTs are in closer proximity to residential receptors than Orote and Yigo, and receptors proximate to the Dededo and Macheche CTs will also experience impacts from significant traffic congestion along the Guam Road Network in the construction phase (Vol. 6, Figure 4.2-4), whereas other CT locations will not have these additive impacts. This impact avoidance opportunity should be documented in the FEIS. When avoidance of impacts is not possible, mitigation measures should be identified that could reduce health impacts, with commitments to implement these in the FEIS and ROD.

For the accuracy of the FEIS, we recommend all references to limitations of MSAT analysis, including why emissions, dispersion, and exposure tools are not available for a quantitative MSAT analysis[58], be removed (Vol. 6, pages 7-30 – 7-33). EPA also recommends that DoD remove the reference to the guidance as "Joint Interim Guidance" from FHWA and EPA (Vol.6, p. 7-10), as this is not EPA guidance.

F. Air Quality Mitigation and Adaptive Management

The air quality impact assessment concludes that mitigation measures to reduce air quality impacts are not warranted for the new Main Cantonment (Vol. 2, p. 5-36) and that air quality impacts are less than significant for all preferred project elements (Vol. 7, p.3-9, 3-10). As previously stated, we disagree with the impact assessment methodology that led to some of these conclusions (see Interim Power Generation comment), and we also disagree with the statement that the need for mitigation measures ultimately depends on combined air emissions (Vol. 2, p. 5-29). The location of receptors and their potential for exposure should determine the need for air quality mitigation, since protecting human health is the purpose of all clean air programs and regulation.

Despite its impact assessment conclusions, the DEIS does acknowledge that air quality will decline as a result of implementing the proposed actions due to increased population, increased power usage (increased burning of high sulfur fuels), construction activities, and related traffic congestion (Vol.7, p 2-49, 2-52). The DEIS identifies some potential mitigation measures under its adaptive management mitigation proposal. We have two concerns with this approach to air quality mitigation: (1) the monitoring and establishment of action and tipping points for air quality[59] are not appropriate as they do not relate to public health, and (2) the proposed mitigation measures should occur *up front* to achieve immediate impact reductions, and not depend on a monitoring trigger. (See also comment under Adaptive Management).

Air mitigation measures identified in the DEIS include (Vol. 7, p. 2-5, 2-54)):

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[58] This discussion is from prototype language included in the February 2006 FHWA Interim Guidance on Air Toxics Analysis in NEPA Documents which EPA believes mischaracterizes the adequacy of existing air toxics methodology and tools for quantitative analysis. While there are positive elements to this guidance, especially the willingness to acknowledge potential MSAT concerns, EPA continues to disagree, nationally, with major elements of this approach (which are carried forward in FHWA's update to this guidance issued September 2009).

[59] The air quality "action point" or "tipping point" would relate to power consumption and include testing for fuel sulfur content, weekly monitoring for opacity, and a continuous monitoring system to monitor fuel consumption and the ratio of water-to-fuel being fired in the CTs.

- In cooperation with GEPA, short-term air monitoring sampling for pollutants such as particulate matter and volatile organic compounds (VOCs) could be considered to monitor construction air quality impact around major construction sites in sensitive neighborhoods with lengthy construction duration.
- The Navy potentially could include measures in construction contracts for anti-idling requirements for construction vehicles; operational agreements that reduce or redirect work or shift times to avoid community exposures when sites are in proximity to vulnerable populations (e.g., schools); and pursing technological improvements to equipment, such as off-road dump trucks and bulldozers, particulate matter traps, oxidation catalysts, and other exhaust after-treatment devices.
- A Traffic Management Center could be developed and implemented by GovGuam to monitor traffic flow and congestion. *(EPA notes that while this is identified for GovGuam to implement, DoD should include a project-related construction traffic and parking management plan that minimizes traffic interference and maintains traffic flow.)*
- Buffer zones could be created between new or expanded road alignments and areas of vulnerable populations. *(The DEIS identifies this mitigation measure for GovGuam to implement, but the project is creating the Guam Road Network and this measure is within DoD's control.)*
- An option could be provided for using low sulfur diesel fuel for construction and highway vehicles. *(The DEIS identifies this mitigation measure for GovGuam to implement, however DoD can and should pursue this option -see comment under transportation fuels).*
- The pending MSAT analysis results would also be used as a consideration for avoiding potential significant health risks from on-road vehicle operations during construction periods (Vol. 7, p. 2-53) *(See comment under MSAT air and health impacts. EPA is available to assist DoD in determining the best mitigation strategy to reduce MSAT emissions and exposure should the pending MSAT analysis identify hotspots in proximity to residences or sensitive receptors.*).

An additional mitigation measure not identified in the DEIS could include identifying sensitive receptors in the project area, such as children, elderly, and infirm, and specifying the means by which impacts will be minimized to these populations. For example, locating construction equipment and staging zones away from sensitive receptors and fresh air intakes to buildings and air conditioners. DoD should also consider fugitive dust source controls, such as: 1) installing wind fencing and phasing grading operations where appropriate, and operating water trucks for stabilization of surfaces under windy conditions, and 2) preventing spillage and limiting speeds to 15 miles per hour (mph) when hauling material and operating non-earthmoving equipment, and limiting speed of earth-moving equipment to 10 mph.

> *Recommendation:* EPA recommends that DoD commit to implementing the mitigation measures it identifies in the FEIS, as well as the additional measures identified above, at the beginning of project planning and construction, and not only in response to an

adaptive management monitoring trigger. EPA recommends that these measures be incorporated into a Construction Emissions Mitigation Plan in order to reduce impacts associated with fugitive dust, diesel exhaust, and mobile source air toxics from construction-related activities. Priority should be given to providing an option for using low sulfur diesel fuel for construction and highway vehicles. All appropriate measures should be included in all construction contracts and DoD should oversee and ensure implementation. DoD should include the Construction Emissions Mitigation Plan in the FEIS and identify its commitments to these measures in the ROD.

Regarding the adaptive management strategy, the NAAQS should be used as the "tipping point" for criteria pollutant monitoring results to trigger construction tempo reductions. See our comments under Adaptive Management.

G. Monitoring

As mentioned above, EPA is currently reviewing the existing sulfur dioxide standard and expects to soon take final actions that could lead to a lower, more protective, standard. As part of this action, EPA would require GovGuam to install at least one air monitor by 2013. It would be of great value to commence SO_2 monitoring on the island in advance of the 2013 deadline to ensure tracking of air quality impacts and protection of public health before and during the buildup. Since 2013 is projected to be one of the peak construction years, the military buildup could be considered among the sources that would need to be controlled if SO_2 monitoring demonstrates that Guam is not attaining the SO_2 standard. DoD should consider the benefits of operating an air monitor to establish baseline ambient air quality.

Recommendation: EPA recommends that DoD obtain baseline SO2 monitoring data before construction commences to identify DoD's contributions to the SO_2 levels measured with the new 2013 monitor.

H. Greenhouse Gas Emissions and Climate Change

1. Baseline discussion

The DEIS does not present a useful baseline discussion on the problem of climate change, nor is it substantially addressed in the cumulative impact assessment. EPA recommends that the FEIS include a general discussion of global climate change based on EPA's Technical Support Document developed for the December 2009 endangerment finding, which was vetted through all federal agencies. Alternatively, for U.S. impacts, the Executive Summary and key findings of the most recent U.S. Global Climate Research Program report, "Global Climate Change Impacts in the U.S."(http://downloads.globalchange.gov/usimpacts/pdfs/executive-summary.pdf) could be consulted and summarized. For a discussion of regional effects, the Islands regional chapter from this report (http://downloads.globalchange.gov/usimpacts/pdfs/islands.pdf) is recommended. Providing this baseline discussion will help ensure disclosure of the incremental impacts of the proposed GHG emissions and highlight the importance of the existing condition with regard to climate change for providing the context for a discussion of cumulative impacts

(See also Cumulative Impacts comment). This section should also discuss Executive Order 13514's GHG reduction targets.

2. Methodology

The DEIS estimates carbon dioxide (CO_2) annual emissions for the preferred alternatives in its assessment of greenhouse gases (GHGs) (Vol. 7, p. 3-11). The DEIS states that because CO_2 emissions comprise approximately 85% of GHGs, and CO_2 emission factors are readily available for many stationary and mobile sources, CO_2 was selected for this DEIS to represent GHG emissions (Vol. 2, p. 5-8). This methodology does not take into account GHGs other than CO_2 some of which have a greater global warming potential (GWP) than CO_2. It is now common for EISs to estimate non-CO2 GHGs in terms of CO_2 equivalency, which is a quantity that describes, for a given mixture and amount of greenhouse gas, the amount of CO_2 that would have the same global warming potential (GWP)[60], when measured over a specified timescale. For example, methane has a global warming potential most recently estimated at 23 times that of carbon dioxide (CO_2). The DEIS identifies only the CO_2 emissions associated with the use of the Navy landfill (Vol. 6,p. 7-27) for example, and not the methane in CO_2 equivalence. Because the DEIS does not account for GWP in its calculations, it underestimates project impacts[61].

3. Alternatives Analysis and Mitigation

CO_2 emissions were calculated for construction, some interim power generation alternatives, and roadway projects; however, the DEIS did not discuss these emissions, nor does it present them in comparative form, "providing a clear basis for choice among options by the decision-maker and the public" (40 CFR 1502.14). The DEIS does not include CO_2 emissions for the preferred interim power alternative, so no comparison of these alternatives can be made. We understand that many of the emissions for the new Main Cantonment and Marine Corps operations would not be new but transferred from base operations in Okinawa, Japan; however, there are elements of the project where an alternatives analysis of impacts related to greenhouse gas emissions and climate change would be useful, such as in reference to power supply, increases in mobile sources from transportation, and landscape alteration. The alternatives within these project components have the potential to vary in GHG emissions to a significant degree, and providing this information as a summary could be useful for the decision-maker.

The predicted construction CO_2 emissions range from about 16,490 to 31,464 tons per year (tpy) from 2011 to 2014 and the predicted operational CO_2 emissions range from about 180,216 to 186,134 tpy from 2015 forward (Vol. 7, p. 3-13). The DEIS states that GHGs effects would be considered less than significant (Vol. 7, p. 3-14). However, to provide further relevant context,

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[60] Global Warming Potential (GWP) is defined as the cumulative radiative forcing effects of a gas over a specified time horizon resulting from the emission of a unit mass of gas relative to a reference gas. The GWP-weighted emissions of direct greenhouse gases in the U.S. Inventory are presented in terms of equivalent emissions of carbon dioxide (CO2), using units of teragrams of carbon dioxide equivalents (Tg CO2 Eq.).

[61] We note that EPA's GHG reporting rule, promulgated on September 22, 2009, requires reporting of greenhouse gas (GHG) emissions in CO2 equivalents for carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), hydrofluorocarbons (HFC), perfluorocarbons (PFC), sulfur hexafluoride (SF6), and other fluorinated gases including nitrogen trifluoride (NF3) and hydrofluorinated ethers (HFE).

DoD should consider discussing GHG emissions in terms of the quantities required under the GHG reporting rule[62] as well as those identified in the proposed PSD tailoring rule, and indicate whether any project components would be potentially regulated under these rules. We also recommend discussing how the different alternatives would compare for purposes of DoD achieving 2020 GHG reduction targets under EO 13514. We note that section 2(f)(iv) of the EO mandates identification and analysis of impacts from energy usage and alternative energy sources in NEPA documents on new or expanded facilities.

No mitigation measures are identified for GHG emissions. At a minimum, DoD should consider the use of energy efficiency and renewable energy projects, as outlined in the comment titles "Comprehensive Energy Plan" as a means for reducing GHG emissions. DoD should also consider the adoption of anti-idling measures for construction vehicles in construction contracts, as outlined in the "Mitigation and Adaptive Management" comment, and the utilization of cogeneration instead of flaring methane produced in the anaerobic digesters at WWTPs that are upgraded for the project (see comment under "Anaerobic Digestion - Energy Generation"). Other options could include implementation of green vehicle procurement, bus replacement programs for the island, etc.

4. Adaptation

The potential impacts of climate change on the proposed project alternatives were not discussed. The NEPA process provides an opportunity to evaluate the alternatives from this perspective, and this is very useful information for long-term planning. The FEIS should identify if there are specific adaptation measures needed to protect the project from the effects of climate change. For example, sea level rise may be as great as a meter by the end of this century. The FEIS should discuss how all waterfront projects consider sea level rise is their design and maintenance.

> *Recommendation:* EPA recommends the FEIS be updated per the above. A baseline of climate change effects should be discussed in the FEIS. We recommend emissions be discussed in terms of requirements under the GHG reporting rule, indicating whether any project components will be required to report. Emissions from the preferred interim power alternative should be disclosed, and a greater distinction between project alternatives in relation to GHG emissions should be presented. Mitigation measures should be identified, and adaptation for anticipated climate change effects on the project should be discussed.

I. Additional Air Quality Comments

- The DEIS indicates that radon mitigation measures will be incorporated into new construction in high radon zones. EPA recommends using local Radon experts for radon mitigation during new construction. This will support the emerging radon industry and

[62] Facilities that emit 25,000 metric tons or more per year of GHG emissions are required to submit annual reports to EPA. The GHG reporting rule is intended to collect accurate and timely emissions data to inform future policy decisions.

help protect Guam residents, in general, from Radon exposure by building the capability to address the radon problem in the civilian population's homes throughout Guam.

- In the DEIS, DoD states that asbestos may be present at the wharves, and work would comply with applicable regulations for the survey/inspection and management of these materials (p. Vol. 2, p. 2-89). We note that any asbestos removal and every building demolition would require notification to EPA Region 9 under the Asbestos National Emissions Standards for Hazardous Air Pollutants (NESHAP) regulation even if it has been previously determined that no asbestos containing materials (ACMs) are present at the building proposed for demolition. An asbestos survey must be conducted and a 10 working day waiting period after notification to EPA is required. A qualified Asbestos Hazard Emergency Response Act (AHERA) inspector must be used, and if material is present it must be removed by qualified AHERA workers/supervisors. Demolition contractors normally complete the notification, but the regulation allows either the owner or operator to submit the notification to EPA. Guam EPA has regulatory requirements for asbestos removal that mirror EPA NESHAP and AHERA requirements. Guam EPA should also be notified of any demolition or renovation activities.

III. SOLID WASTE

A. Insufficient solid waste characterization and management planning

Existing and planned landfill facilities on Guam do not provide viable options for managing all of the solid waste stream components that are expected to be generated during and after the proposed action. Consequently, the Preferred Alternative for land disposal does not appear to be adequate. The DEIS does not present a comprehensive strategy for managing the large volumes of solid waste associated with the project.

> *Recommendation*: DoD should develop and perform a waste characterization study using the existing DoD waste stream, and prepare a report on waste stream composition, by percent, on a weight basis. DoD should also perform waste management planning and prepare an integrated solid waste management plan addressing the DoD solid waste planning hierarchy of: 1) source reduction, 2) reuse, 3) recycling (including composting), and 4) disposal, and Executive Order 13514. DoD should develop waste stream projections based on available waste stream data and population projections, and the waste characterization study, and compile the information into a projected waste stream composition. (Note: the basis for the 7.4 generation rate should be explained, including waste stream composition) This information would be used to develop an integrated waste management plan that includes a summary of available disposal and diversion options for each waste stream component, as well as collection and transportation, and conformance with the DoD solid waste planning hierarchy[63]and Executive Order 13514.
>
> The integrated waste management plan should include the "Non-DoD Proposed Action Related" projections, as this source of increased solid waste is expected to comprise a

[63] Per Navy Instruction OPNAV INST 5090.1C 5-4.1(d)

significant portion of the total volume. The DEIS does not mention how this source of solid waste will be managed during or after the proposed action. The Government of Guam's current landfill facility, Ordot, is an unlined dump, a designated Superfund site, has been cited for numerous environmental and permitting infractions, and is under a federal consent decree. Layon is not expected to be in operation until the summer of 2011. Airspace at Ordot is extremely limited and the landfill may not be able to accommodate any increased volumes of solid waste from the proposed action or the estimated "direct, indirect, and induced" population.

The waste characterization and the integrated waste management plan should be completed before the issuance of the FEIS and provided to EPA for review (April 2010). Via this plan, DoD needs to demonstrate how they, their contractors, and subcontractors will manage solid waste during construction and through long-term operations on Guam. In addition, substantial investment in new recycling and reuse infrastructure may be necessary to meet goals of Executive Order 13514[64].

The comments below expand on solid waste management concerns and provide additional recommendations, as appropriate.

B. Projected Solid Waste Estimates and Estimated Population Increase on Guam

It is unclear how Table ES-2 "Estimated Total Population Increase on Guam from Off-Island" and Table 2.4-1 "Projected Solid Waste Estimates" comport. In Table ES-2, it appears that "Off-Island Construction Workers (DoD Projects)" and "Dependents of Off-Island Construction Workers (DoD Projects)" are part of the "Direct DoD Subtotal." It is unclear under which category in Table 2.4-1 these populations are included (e.g., "DoD Proposed Action Related" or "Non-DoD Proposed Action Related" in Table 2.4-1).

C. Preferred Alternative inconsistent with operation of Layon and Navy Landfills

The DEIS indicates that the Preferred Alternative for solid waste disposal is to use the Navy Sanitary Landfill at Apra Harbor until Layon opens, after which DoD would use Layon for disposal of all DoD solid waste.

Pursuant to the Layon Municipal Solid Waste Landfill Facility Permit No. 09-015 recently issued by GEPA, Layon cannot accept "all DoD solid waste." Waste excluded and/or prohibited from acceptance at Layon includes, but is not limited to, construction and demolition debris (C&D debris), green wastes, industrial wastes, explosives, asbestos, and PCBs. Given the apparent restrictions placed on Layon, it is unclear what types and volumes of DoD solid waste may need a different management option, what those options are, and what impact the options may pose to the environment. There is no indication that the sufficient level of planning is occurring to ensure proper management of waste.

[64] The following link to EPA guidance on environmentally beneficial landscaping for Federal facilities and lands may be helpful: http://www.fedcenter.gov/Documents/index.cfm?id=5961&pge_prg_id=10005&pge_id=1863.

The DEIS states that recent correspondence with GBB (Gershman, et al) indicates that C&D waste would be accepted at the Layon Landfill for recycling and reuse[65] (Vol. 6, p. 2-103). EPA is not aware of any near-term plans of the Receiver to accept C&D waste for recycling and reuse. Moreover, the current Layon permit prohibits the acceptance of C&D waste and the facility operation plan does not include recycling or reuse activities. Green waste is also prohibited at Layon.

Until Layon opens, DoD states that DoD will continue to use the Navy Sanitary Landfill at Apra Harbor. The Navy Sanitary Landfill is unlined, and statistically significant concentrations of chlordane and five volatile organic compounds have been detected in the down-gradient groundwater wells in recent years. In addition, the Navy Sanitary Landfill permit may be subject to revisions by Guam EPA that could impact and/or restrict current operations and waste acceptance practices.

> *Recommendation:* As part of an integrated waste management plan, the Navy should establish a mandatory recycling program as soon as practicable to apply to the existing Navy base, and to the new Marine Corps base given the apparent waste acceptance limitations at Layon. The DEIS does not identify sufficient reuse and recycling infrastructure to accomplish the probable needed waste diversion. It is also not clear whether enforcement of any recycling mandates would occur. (See additional comments below under "Source Reduction, Recycling and Composting")
>
> Based on the DEIS solid waste projections, the additional solid waste associated with the proposed action would accelerate Layon's staged development plan which could have permit and environmental implications.
>
> The FEIS needs to address the collection and transportation of DoD solid waste to Layon and the potential impacts of such collection and transportation. Truck traffic, pollution, and disruption are of critical concern to the residents near the Layon landfill.

D. Continued Use of Anderson AFB landfill

Anderson AFB landfill is not included in the Preferred Alternative for solid waste disposal, however the proposed project would involve numerous activities and increased personnel at Anderson for construction of the Marine's Air Combat Element (ACE) project actions[66], facilities to support air embarkation[67], and construction of the new North Gate and access road (Vol. 2, Section 2.4). The DEIS states that because the Anderson AFB can only accommodate its disposal needs through 2009 and the new landfill it intends to use would not be available until July 2011, the Air Force would need to further expand the existing landfill or pursue diversion

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[65] It is EPA's understanding that neither the Layon permit nor the Operations Plan allow for the recycling and reuse of C&D waste. Currently, C&D debris is a prohibited waste in the Layon permit.

[66] ACE related projects at Anderson AFB include construction of 36 structures, including MALS Hangar, Corrosion Hangar, Air Ops Center, AAFB North Ramp Parking, Squadron Aircraft Hangars, armories, fire station, control tower, and maintenance shops

[67] The DEIS identifies 13 structures needed for air embarkation support

and/or operational measures to maximize landfill life (Vol. 6, p. 3-26). There is insufficient information to address landfill expansion or diversion and/or operational measures, impact from a potential Andersen landfill expansion, or contingency plans in the event DoD fails to obtain timely permit approval for its proposed expansion.

E. Construction and Demolition (C&D) Waste

Overall, the DEIS inadequately addresses C&D as there is no waste characterization or integrated waste management plan in the DEIS. Although a C&D study is underway to address recycling and reuse opportunities associated with the construction phase (Vol. 6, p. 2-104), the lack of an integrated waste management plan makes it difficult to determine whether there are sufficient facilities, capabilities, and required approvals and permits in place for disposal or diversion of C&D waste.

There is very little C&D hardfill capacity available on-island to deal with the large volume of C&D debris that would be generated (Vol. 6, p. 2-103), and the DEIS states that "it is recommended" that the military develop new hardfill capacity and upgrade and greatly expand its recycling programs (Vol. 6, p. 2-103). No plans for developing these capacities are identified.

In addition, deconstruction plans should be developed, and reuse of building shells as well as materials should be considered to reduce waste. Deconstruction (dismantling a building for reuse) allows building materials to be reused and recycled while saving money and supporting LEED credits. DoD has extensive deconstruction experience and EPA recommends the following resources:

- A Deconstruction Guide for Military Installations https://frptoolbox.erdc.usace.army.mil/frptoolbox/library/docs/16.pdf
- Deconstruction Institute: http://www.deconstructioninstitute.com/
- Building Materials Reuse Association: http://bmra.org/

In general, the DEIS emphasizes landfill disposal over waste reduction, reuse, recycling and composting and does not appear to meet Federal/DoD/Navy[68] Solid Waste Planning Priorities. As mentioned, the Navy requires installations to use the following hierarchy for waste management: (1) Source reduction, (2) Reuse, (3) Recycling (including composting per definitions in the Instruction), and (4) Disposal via landfill or incineration. The DEIS indicates that a study is underway related to municipal solid waste recycling for long term DoD waste generation on Guam, including waste generated as part of the military buildup. (Vol. 6, p. 2-104 and p. 3-61). The study should help guide specific actions; however, a comprehensive integrated waste management plan should be developed prior to the issuance of the FEIS and provided to EPA for review.

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[68] The Navy/Marine Corps planning process is required at the earliest possible time to ensure actions: "Enhancing the quality of renewable resources and working toward the maximum attainable recycling of depletable resources." OPNAV INST 5090.1C 5-4.1(d)

The DEIS does not discuss any composting options. DoD guidance states that installations shall compost organic waste as an alternative to landfilling whenever possible, and that if municipal composting facilities are not available, composting facilities should be established at the installation (OPNAV INST 5090.1C 16-5.6)[69]. The DEIS mentions composting only in relation to an incomplete GovGuam planning document.

Developing major reuse, recycling, and compost facilities during construction and operations is critical to achieve Navy, DoD, and Federal requirements, and in light of land disposal limitations at Layon. Although DoD mentions that they are required to achieve the diversion goals of EO 13423, there is no substantive discussion or plans for implementation.

> *Recommendation:* As part of its integrated waste management plan, DoD should develop and implement, as appropriate, an expanded source reduction and diversion program to minimize the amount of solid waste being landfilled, particularly given the apparent waste prohibitions at Layon.
>
> Specific facility needs for reuse, recycling, and composting should be identified and accommodated in site plans for the construction and operation of the new Marine Corps Main Cantonment, other project sites, and at existing bases at Anderson AFB and Navy Base Guam. Given limited landfill capacity and contamination concerns, efforts to maximize resource recovery through reuse, recycling, composting, and anaerobic digestion[70] must be assessed. Significant planning will be required to support:
>
> - Defense Reutilization and Marketing Office or other non-building materials reuse facilities,
> - Plans to include space in all buildings (inside and outside) for recycling and composting storage - a LEED-NC prerequisite,
> - Recycling facilities to divert waste generated in both the construction and operations phases,
> - Composting facilities to divert green waste, clean wood waste, food waste, and other organic materials,
> - Fuel-efficient vehicles and collection systems to support all ashore and afloat collection of recyclable materials,
> - Truck scales to weigh materials to calculate diversion and recycling rates and support the sale of recyclable materials.

[69] Navy installations shall compost landscaping cuttings, yard and green waste, limbs, branches, and other organic materials suitable for composting at an installation, municipal, or private facility. Installations shall consider the following composting alternatives when determining the most feasible composting method: requiring landscaping contractors to deposit green waste at an installation, municipal or private composting facility; using municipal or regional composting facilities; or establishing composting facilities at the installation if municipal composting facilities are not available or feasible (OPNAV INST 5090.1C 16-5.6)

[70] See anaerobic digestion comment under Wastewater

F. Green Waste

As mentioned above, the Layon permit prohibits the acceptance of green waste, and composting is not addressed in the DEIS. Very large volumes of green waste will be generated from clearing of vegetation for the project sites. Over 2,000 acres of vegetation will be cleared on Guam (Vol. 7, p. 3-27), and this includes an estimated 1,577 acres of limestone forest. The DEIS does not identify how this waste will be managed.

> *Recommendation:* As part of an integrated waste management plan, the DEIS should identify the management options for the large volumes of green waste from vegetation clearing, as well as other sources of green waste. Plans to manage these wastes should be in place before project green waste is generated.

G. CVN Carrier Waste

Carrier operations involving 5,600 personnel would generate a significant amount of waste. The DEIS states that typically, solid waste storage bins would be provided in the aircraft carrier compound and near the "Morale, Welfare, and Recreation" activity area, as needed. This solid waste would be handled and managed in accordance with Navy standard operating procedures and would be disposed of at the Navy landfill as long as it meets all criteria for disposal (Vol. 4, p. 2-40).

> *Recommendations:* As part of an integrated waste management plan, a more detailed and robust source reduction, reuse, recycling, and composting plan should be included in the CVN berthing project description. In addition, Navy Region Southwest and other carrier facilities with extensive afloat recycling experience should be consulted regarding design alternatives to maximize easy recovery and recycling of major materials streams: scrap pallets (for repair and reuse), metals, wood, cardboard, plastics, and food waste. Reuse and recycling of materials should be prioritized over landfill disposal, and facility plans should include design criteria to provide adequate space for recycling storage. In addition, a commitment to participate in the Waste Reduction Afloat Protects the Sea (WRAPS)[71] program to reduce the impacts of waste at sea should be included in the FEIS.

IV. HAZARDOUS WASTE

A. Hazardous Waste Minimization/ Pollution Prevention

The proposed action will increase the amount of hazardous materials and waste generated on Guam. The DEIS estimates that approximately 16,000 lbs of hazardous waste, or half of what is generated on Okinawa, would be generated, and that increases in hazardous materials may require the DRMO (Defense Reutilization and Marketing Office) on Guam to expand its hazardous materials handling, storage, and disposal capacity (Vol. 2 p. 17-39). Navy guidance on pollution prevention states that "all Navy activities shall identify means and methods for the elimination or minimization of pollutants and, where possible, incorporate them at the earliest stages of planning, design, and procurement of facilities, ships, aircraft, weapon systems,

[71] WRAPS info available at: http://www.navy.mil/oceans/WRAPSFS.pdf

equipment, and material" (5090.1C). The DEIS includes a BMP to implement aggressive hazardous waste minimization plans that substitute non-hazardous or less toxic materials, but the DEIS does not address any actual planning being conducted to eliminate or minimize pollutants or to mitigate the impacts of hazardous pollutants. In addition, the discussion of required regulatory involvement does not support conclusions regarding lack of significant impacts. There are already significant capacity limitations and the added burdens cannot be accurately estimated from this discussion.

> *Recommendation:* As part of the planning process, a detailed assessment of the total quantities and types of hazardous materials used on Guam and Okinawa, as well for the proposed construction activities, should be conducted. Information regarding additional hazardous materials handling facilities, storage, and disposal capacity should be included.
>
> A pollution prevention plan and assessment should be developed with specific pollution prevention activities, equipment, and process changes to eliminate, where possible, and reduce hazardous materials. Green purchasing practices should be developed and implemented to meet DoD, human health, and environmental objectives. We recommend a mitigation measure be included to require testing alternatives to toxic substances for the construction and operation phase. We also recommend that Leadership in Energy and Environmental Design (LEED) certification credits to reduce the use of hazardous materials in building construction be pursued (See comment below regarding LEED).

B. Polychlorinated Biphenyls (PCBs) in Concrete/ Construction Materials from Demolitions

EPA had informed DoD during project-related meetings of the potential presence of PCBs in concrete and other construction materials in existing buildings on Guam. The DEIS does not identify or address this potential problem.

Prior to 1978, PCBs were used in some building materials, including caulk and paint. As a result, PCB-containing caulking, paint and other materials have been found to be present in some buildings constructed or maintained during that period. The Toxic Substances Control Act (TSCA) and its implementing regulations in 40 CFR 761 prohibit the continued use of most materials containing PCBs at greater than 50 ppm. The management, reuse, disposal and other disposition of materials containing PCBs and PCB residues are also extensively and strictly regulated.

The project will involve demolition of a number of buildings and reuse of building materials. If PCBs are present in some or all of these materials, the management of any demolition activities and the disposition of demolition debris could substantially affect the environmental impacts and logistics of those activities.

> *Recommendation:* Describe whether and how building materials will be tested for PCBs and how they will be managed if they are found to contain PCBs. If materials do contain PCBs, describe where and how the material will be stored and disposed, who will conduct testing, and how DoD will track this process to ensure its proper disposal. For

additional information, see: http://www.epa.gov/pcbsincaulk/caulkremoval.htm and http://www.epa.gov/epawaste/hazard/tsd/pcbs/index.htm.

C. Hazardous Materials and Waste Discussion

We offer the following observations and comments on the hazardous materials and waste chapter in Volume 2, which may also apply to this chapter in other volumes. We recommend the FEIS provide clarification regarding these issues:

- Military Munitions Rule: The description of the Military Munitions Rule requires clarification because the cited language primarily applies to active ranges. Munitions and explosives of concern (MEC), including unexploded ordnance (UXO) and discarded military munitions (DMM) generally meets the definition of a CERCLA hazardous substance and/or a RCRA hazardous waste. Therefore any planned activities that encounter MEC outside of active or inactive ranges are subject to regulatory oversight. The discussions in Chapter 18 regarding public health and safety do not reference the required regulatory oversight when MEC/UXO/DMM is encountered. No discussion is included of available permitted Open Burn /Open Detonation (OB/OD) facilities nor any discussion of the potential public safety threats which may arise if items are encountered which cannot be relocated. The assertion that there will be no adverse impacts because UXO technicians will screen areas prior to intrusive activity is based on the questionable assumption that the areas with MEC contamination have been identified. In addition, while the OB/OD facility is identified in Vol. 2, p. 17-49, it does not indicate if the facility can accept waste from off-base locations, for example, munitions encountered during road construction.
- The description/definition of "hazardous substance" in Sections 17.1.2 and 17.1.2.1 do not accurately reflect the statutory definition and foster confusion regarding the proper use of the terms "hazardous substance", "hazardous material" and "hazardous waste" throughout Chapter 17 and 18.
- RCRA also regulates generators of hazardous waste, and Guam has been authorized by EPA to manage hazardous waste under its regulations in lieu of federal RCRA (Vol. 2, p. 17-3). The FEIS should clarify Guam EPA's role under its authorized RCRA program. (Vol. 2, p. 17-17, 7-9, 7-29)
- The DRMO discussion on p. 17-7 of Volume 2 should clarify the distinction between hazardous materials and hazardous wastes. Additionally, several sections refer to the "increased use of hazardous waste". We assume this indicates waste generation, therefore this language should be corrected (Vol. 2, p. 17-11, 43, 44, 45, 47, 51).
- The map on page 17-30 identifies Anderson AFB as an National Priorities List (Superfund) site. The FEIS should identify the role that EPA and Guam EPA will play if construction does disturb these Installation Restoration Program (IRP) sites.
- Apra Harbor is a RCRA regulated facility. The FEIS should identify how GEPA be involved in the management of contaminated soils at that facility (Vol. 2, p. 17-34).

V. SUSTAINABILITY

DoD has a tremendous opportunity for this project to be a show case model of sustainable design and efficiency, helping to maintain the limited and fragile natural resources on the island and ensure the long term resource security needed for DoD's critical mission. Embracing sustainable development could provide specific benefits to DoD: direct cost savings; improvements in productivity, morale, and retention; and improving military readiness. The Unified Facilities Criteria (UFC) 4-030-01 states that developing sustainable facilities can enhance national security by increasing DoD's energy reliability, and improve the image and reputation of DoD as a steward of environmental resources (UFC, p. 32).

Integrated approaches to smart growth, transit, green building and sustainable infrastructure (renewable energy, wastewater, recycling and composting) that benefit the entire community are crucial to protecting public health and mitigating impacts from the buildup. The magnitude of the project and its potential impacts necessitate that sustainability be incorporated at all levels of planning, construction, and operations. Sustainability should be viewed as a holistic goal for both the on-base activities and the impacts of base activities to off base resources.

The DEIS does not provide an "integrated strategy towards sustainability", as required by Executive Order (EO)13514[72], nor does it adequately address many of the Executive Order and DoD requirements. EO 13514 states that:

> *"In order to create a clean energy economy that will increase our Nation's prosperity, promote energy security, protect the interests of taxpayers, and safeguard the health of our environment, the Federal Government must lead by example. It is therefore the policy of the United States that Federal agencies shall increase energy efficiency; measure, report, and reduce their greenhouse gas emissions from direct and indirect activities; conserve and protect water resources through efficiency, reuse, and stormwater management; eliminate waste, recycle, and prevent pollution; leverage agency acquisitions to foster markets for sustainable technologies and environmentally preferable materials, products, and services; design, construct, maintain, and operate high performance sustainable buildings in sustainable locations; strengthen the vitality and livability of the communities in which Federal facilities are located; and inform Federal employees about and involve them in the achievement of these goals."*

The project as proposed does not conform with many of these requirements, and as such, cannot be considered a project that emphasizes sustainability. Specifically, the project does not:

- **Contribute to a clean energy economy per EO 13514, or maximize energy efficiency:** As identified in our comments under Air Quality, the DEIS does not commit to incorporating renewable energy elements into the project and instead will use diesel or fuel oil-fired combustion turbines for short and medium-term power needs, and is working with GPA to developing a new diesel-fired power plant to serve long-term project needs. Energy efficiency opportunities on DoD land or island-wide are not being pursued.

[72] E.O. is available at: http://edocket.access.gpo.gov/2009/pdf/E9-24518.pdf

- **Conserve and protect water resources through efficiency, reuse, and stormwater management:** See our comment under water resources. The project does not maximize water loss, either from DoD's or GWA's water system, not does it propose any reuse options.
- **Eliminate waste, recycle, and prevent pollution:** See our comments under Waste Minimization and Management. Sufficient reuse and recycling infrastructure needs are not identified in the DEIS, nor included in site plans.
- **Promoting environmentally preferable materials, products, and services:** Green procurement is not mentioned in the DEIS. DoD has a Green Procurement Program[73] (GPP) which sets a goal of 100% compliance with Federal GPP programs in all acquisition transactions. The project should address plans to comply with DoD's Green Procurement Program and include objectives/targets for GPP performance (purchases of green products and services) that are consistent with the nature and quantity of purchasing activities.
- **Strengthen the vitality and livability of the communities in which Federal facilities are located:** Many of our comments address the significant impacts to local services and utilities and to local communities. See also comments regarding Environmental Justice, and Reducing Vehicle Miles Traveled (Offbase) below.

Additionally, DoD's Unified Facilities Criteria (UFC) requires that DoD establish project sustainable development goals, defining the process to achieve them, and developing a clear understanding of the expected results (UFC, p. 12). The DEIS identifies some general goals for sustainability for DoD *as an agency*, and references Executive Orders, the Energy Policy Act of 2005, and the Memorandum of Understanding on Federal Leadership in High Performance and Sustainable Buildings, however specific sustainability goals *for the project* are not clearly delineated (Vol. 1, Sect 1.10). The following comments provide more detail and include specific recommendations towards meeting these goals.

A. Leadership in Energy and Environmental Design (LEED) certification

Federal laws, regulations, and Navy policies, including the requirement that all new buildings be certified Silver, at a minimum, under the Leadership in Energy and Environmental Design (LEED) certification program, provide a good *starting point* for making this project sustainable. LEED is one of the many tools that could help address certain aspects of sustainable development; however, LEED-New Construction (NC) Silver certification alone may not be enough to deem a project sustainable. The LEED credits or points needed to achieve the silver certification might not lead to the most sustainable approach. Maximizing certain types of credits or points could achieve a more sustainable project while the inverse could also be true. DoD should incorporate long term sustainability while accruing LEED credits or points during the certification process. In addition, DoD could consider using the LEED Guide for Multiple

[73] Green procurement is the purchase of environmentally preferable products and services in accordance with one or more of the established Federal "green" procurement preference programs. The GPP applies to all acquisitions from major systems programs to individual unit supply and service requisitions. The purpose of the GPP is to enhance and sustain mission readiness through cost effective acquisition that achieves compliance and reduces resource consumption and solid and hazardous waste generation. See http://www.wbdg.org/pdfs/DoD_gpp_082704.pdf

Buildings and On-Campus Building Projects[74], which certifies multiple buildings and could save on certification costs.

Recommendations:

1. Focus on obtaining LEED key credits that are of most importance to human health and Guam's environment and that are not covered under various federal mandates. We recommend the following specific LEED credits be prioritized for each category as follows:

   <u>Sustainable Sites</u>
   - Credit 1 – Sustainable Sites
   - Credit 2 – Development Density & Community Connectivity
   - Credit 5.1 – Protect or Restore Habitat
   - Credit 5.2 – Protect Open Space

   <u>Water Efficiency</u>
   - Credit 1 - Water Efficient Landscaping
   - Credit 2 - Innovative Wastewater Technologies
   - Credit 3 - Water Use Reduction

   <u>Energy & Atmosphere</u>
   - Credit 1 – Optimize Energy Performance
   - Credit 2 – On Site Renewable Energy
   - Credit 5 – Measurement & Verification

   <u>Materials & Resources</u>
   - Credit 2 – Construction Waste Management
   - Credit 3 – Materials Reuse

   <u>Indoor Environmental Quality</u>
   - Credit 1 - Outdoor Air Delivery Monitoring
   - Credit 2 - Increased Ventilation
   - Credit 3.1 - Construction IAQ Management Plan, During Construction
   - Credit 3.2 - Construction IAQ Management Plan, Before Occupancy
   - Credit 4.1 - Low-Emitting Materials, Adhesives & Sealants
   - Credit 4.2 - Low-Emitting Materials, Paints & Coatings
   - Credit 4.3 - Low-Emitting Materials, Carpet Systems
   - Credit 4.4- Low-Emitting Materials, Composite Wood & Agrifiber Products
   - Credit 5 - Indoor Chemical & Pollutant Source Control
   - Credit 8.1 - Daylight & Views

   <u>Innovation Credits</u>
   - Design for Adaptability (see below)

2. Attempt to achieve gold or platinum LEED certification, instead of the minimum goal of Silver certification[75].

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[74] http://www.usgbc.org/ShowFile.aspx?DocumentID=1097

[75] UFC 4-030-01, states that for the FY09 and beyond projects for new buildings, LEED Silver-level rating is the *minimum* goal for applicable projects (p. 8). Also the Memorandum from B.J. Penn, the Assistant Secretary of the Navy for Installation and Environment on August 4, 2006 directing Navy and Marine Corps Commanders to

3. Pursue project certification under LEED for Neighborhood Development (LEED-ND) to ensure a broad sustainability approach. LEED-ND incorporates smart growth principles in a way that LEED-NC, which focuses on individual buildings, does not. LEED-ND provides a comprehensive pathway for creating sustainable communities that reduces emissions from transportation and buildings, the two largest causes of greenhouse gas emissions. Projects built to this standard cultivate a higher quality of life by creating safer and more walkable communities.

   A Note on Housing Density: The DEIS states that the housing density in the Guam Joint Military Master Plan is based on 4-6 units per acre (Vol. 2, p. 2-13). EPA has commented to DoD on several occasions that this density does not provide the environmental benefits that higher density offers. DoD has responded verbally that they cannot increase density on the new Marine Corps Main Cantonment because they need to house the Marines in facilities similar to those on the Air Force base for equity reasons. EPA emphasizes that density does not preclude high-quality housing. Several military installations have high-quality, dense housing, including Fort Belvoir in Virginia and the Naval Training Center in San Diego. These bases offer a range of housing options, including single-family homes.

   The Lincoln Land Institute's Visualizing Density web site[76] is an excellent resource that shows how a given density looks in a real neighborhood. For example, you can see that a density of 8 units per acre is achievable with single-family homes in an attractive layout.

B. Designing for Adaptability

To reduce long-term generation of C&D debris and provide operational flexibility, buildings should be designed for adaptability. Resource are available the EPA and partners' Lifecycle Building Challenge site http://www.lifecyclebuilding.org/resources.php.

Recommendations:

Consider the following design principles:

- Document materials and methods for deconstruction. Select materials using the precautionary principle**.** Design connections that are accessible; use visually, physically, and ergonomically accessible connections.
- Minimize or eliminate chemical connections, binder**s**, sealers and glues on or in materials; use bolted, screwed and nailed connections.
- Separate mechanical, electrical and plumbing (MEP) systems.
- Design to the worker and labor of separation.

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immediately take action to plan, program and budget to achieve *at least* LEED Silver-level rating performance in new and replacement buildings.

[76] Available at: http://www.lincolninst.edu/subcenters/visualizing-density

- Use simplicity of structure and form; incorporate interchangeability.
- Allow for safe deconstruction.

C. Facility Metering Plans do not meet Federal Requirements

The DIES states as a goal for metering, to install remote readable electricity meters annually on 25% (all by 2012) of facilities consuming more than $35,000 per year electricity, and meter additional facilities and utilities as practical based on business case analysis (Vol. 8, p. 6-4). Federal law requires all federal buildings to implement advanced metering "...for the purposes of efficient energy use and reduction in the cost of electricity used in such buildings..." by October 1, 2012. Advanced meters or metering devices must provide data at least daily and measure the consumption of electricity at least hourly. These devices must be used to the maximum extent practicable (Energy Policy Act of 2005, Section 103). Installation of meters on new construction is highly cost effective.

> *Recommendation:* Update the sustainability goal for metering to include the requirements mentioned above. EPA recommends that advanced energy and water meters that can be centrally managed be installed in all buildings.

D. Federal Sustainability Policies and Guidance

Volume 8, Table 6.1-1 lists federal policies and guidance for sustainability. The followings should be added to this table:

- The Federal Leadership in High Performance and Sustainable Buildings MOU (Building MOU) has an energy efficiency target for new construction to reduce the energy cost budget by 30% compared to the baseline building performance rating per the American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE) and the Illuminating Engineering Society of North America (IESNA) Standard 90.1 2004 for building except low-rise residential.

- The Building MOU also provides targets for day lighting under the Indoor Environmental Quality: Achieve a minimum of daylight factor of 2 percent (excluding all direct sunlight penetration) in 75 percent of all space occupied for critical visual tasks. [Note: this will also impact the energy efficiency.]

- The Building MOU also provides language to: Reduce environmental impact of materials; for EPA-designated products use products meeting or exceeding EPA's recycled content recommendations. For other products, use materials with recycled content such that the sum of post-consumer recycled content plus one-half of the pre-consumer content constitutes at least 10% (based on cost) of the total value of the materials in the project.

E. Off-Base Sustainability

As mentioned above, sustainability should be viewed as a holistic goal for both the on-base activities and any adverse impact of these activities to off-base resources. EO 13514 also includes the requirement to "strengthen the vitality and livability of the communities in which Federal facilities are located". As stated, and as the DEIS identifies for some resources, there will be many significant impacts to communities[77].

F. Reducing Vehicle Miles Traveled (Off-base)

The DEIS identifies an area of focus and approach for sustainability related to transportation to include: 1) bicycle and pedestrian oriented site planning, 2) an internal shuttle, and 3) integrating on-site transportation with off-site transportation (e.g. designing on site transportation to conveniently connect with offsite high-capacity systems such as an off-site shuttle) (Vol. 8, p. 6-5). Because the project includes off base roadway construction projects, including pavement strengthening, road widening, and construction of a new road, the transportation approach to sustainability identified for the new base should also apply to these off-base road projects.

Currently, Guam has limited accommodations for pedestrian and bicycle travel, with sidewalks and roadway shoulders comprising the existing pedestrian and bicycle system. Guam currently does not have designated or marked bicycle lanes or paths (Vol. 6, p. 4-4). The December 2008 2030 Guam Transportation Plan[78]states that the policy of the GDPW is to integrate bicycling options and sidewalks into the transportation system as a means to improve mobility and safety of non-motorized traffic. Further, bicycle and pedestrian facilities will be included in any roadway reconstruction or construction of new roadway facilities. Figures S-14 and S-15 of the Guam Transportation Plan show the types of pedestrian/bicycle elements that will be considered on future roadway reconstruction and widening projects. Specific improvements include providing a 4-foot-wide shoulder or marked bike lane, widening the outside lane to 14 feet, completing a partially existing sidewalk, or constructing a new sidewalk or shared-use path. Bike lanes are also recommended for areas of high tourist activity to make a “Complete Street” (See Guam Transportation Plan, p. S-21 – S-24).

Many of the proposed pedestrian and bicycle facility improvements from the Guam Transportation Plan are on the same routes included in the Guam Road Network (GRN) that is part of the project. To promote sustainability, DoD should strategically integrate sidewalks, bicycle lanes/paths (or sufficient shoulders to accommodate safe bicycle travel), or shared-use paths into the GRN. DoD should also facilitate non-motorized travel (i.e., walking and biking) from the proposed military base to popular off base destinations, such as recreational, shopping or tourist areas, to further reduce single occupancy vehicle travel and vehicle miles traveled (VMT) from the base. The DEIS indicates that the proposed military build-up alternatives will result in significant increases to regional VMT ranging from 18% to 20% by 2030 (Vol. 6, p. 7-30 and 7-49). Improvements to pedestrian and bicycle facilities could also help reduce significant impacts to local Guam communities from increased traffic congestion, as alternative transportation modes become safer, more available, and attractive to use.

> *Recommendation:* Integrate strategic off-base pedestrian and bicycle facility improvements with proposed off-base transportation projects in the Guam Road Network

[77] See comments regarding Environmental Justice, Drinking Water and Wastewater, Noise, Air Quality
[78] Available at http://guamtransportationprogram.com/gtpexecutivesummary.html.

to reduce impacts related to increased traffic congestion and/or to facilitate non-motorized travel to and from the base and popular off-base destinations. Consider projects where pedestrian and bicycle improvements would make non-motorized travel more accessible and practical.

G. Clarification on VMT Values

The Air Impact Study (Appendix I) and the Air Quality chapter in Volume 6 use the same Vehicle Miles Traveled (VMT) values for Alternatives 1 and 2, however we believe VMT would be different for these alternatives based on modeling we've seen for other developments. The rationale for using the same VMT value is not explained in the DEIS. Further, the DEIS indicates that an on-base traffic study is currently being conducted and the results will be reported in the FEIS (Vol. 6, p. 4-39). Because of the outstanding base traffic study, it's unclear if the identified VMT values only account for off-base VMT since DoD hasn't completed the on-base traffic study.

Recommendation: EPA recommends that DoD explain the similar VMT values in the FEIS and discuss how the VMT values were determined for the Alternatives. EPA further recommends that DoD update the VMT values once the on base traffic studies are concluded and reflect these changes in appropriate analyses (e.g., air quality).

VI. ENVIRONMENTAL JUSTICE

The Environmental Justice (EJ) analysis is incomplete,[79] and proposed mitigation is insufficient to address the collective environmental justice impacts[80] of the proposed project. The island-wide project impacts are of such magnitude that they have the potential to significantly disrupt many aspects of life for Guamanians and indigenous Chomorrans, including potentially significant health and safety impacts. The EJ analysis in the DEIS acknowledges some impacts to EJ populations, but neglects discussion of a number of potentially significant impacts. Other impacts that were discussed were dismissed as not being significant, and mitigable to less than significant without any basis to demonstrate this. Impacts from the project components were not considered collectively, nor viewed from the perspective of effects on the day-to-day life and health of Guamanians. A substantially more developed mitigation strategy is necessary to avoid significant adverse impacts to EJ populations. Without a robust mitigation strategy, the proposed project does not fulfill the mandate of the Presidential Executive Order on Environmental

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[79] EPA was directed by President Clinton to "ensure that the involved agency has fully analyzed environmental effects on minority communities and low-income communities, including environmental, social and economic effects" when reviewing the environmental effects of a proposed action under Section 309 of the Clean Air Act. (Memorandum from President Clinton on Executive Order 12898 - Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations (February 11, 1994)).

[80] The DEIS acknowledges the unique situation on Guam because racial or ethnic minority groups (as defined by the U.S.) comprise a majority of the Guam population, and the proportions of people living in poverty or who are under 18 years of age are also substantially higher than in the general U.S. population. The DEIS states, "The analysis is further complicated by the fact that Guam is a relatively small and isolated island, and certain types of impacts would be experienced island-wide. Accordingly, the analysis of environmental justice described… acknowledges the unique demographic characteristics of the island population and assumes that the project effects could disproportionately affect disadvantaged groups and children because they comprise relatively high proportions of the population". (Vol 2, p. 19-1)

Justice, which states that Federal agencies shall achieve environmental justice as part of its mission, and address, as appropriate, disproportionately high and adverse human health or environmental effects of its activities on minority populations and low-income populations in the United States and territories.[81]

The DEIS acknowledges significant impacts to EJ populations in north and central Guam in relation to access to public health and social services, traffic congestion, socioeconomic impacts related to the "boom then bust" effect, and access to recreational and cultural resources. The EJ analysis does *not* sufficiently assess the potentially significant impacts to the people of Guam as a result of stresses on the potable water systems and wastewater systems[82], health impacts from degraded air, water, and marine resources; or on communities from impacts to traditional fishing, Chamorro issues, and threats to community cohesion.

Should significant impacts to utility infrastructure be left unmitigated, water outages or low pressure conditions could occur which could lead to illness and effect firefighting (Vol. 6, p. 3-46), and wastewater discharged from a treatment plant can enter the environment where human exposure may occur through the potable (drinking) water supply, recreation (swimming, snorkeling, etc.), or eating shellfish (Vol. 6, p. 19-7). Significant impacts to fish species from ammonia toxicity from wastewater discharges could also occur (Vol. 6, p. 13-18), and the DEIS does not assess the effect this could have on traditional fishing, which is prevalent on the west coast (Vol. 2, p. 2-62).

While the EJ analysis identifies "traffic" as a significant impact[83], it does not disclose the air quality and health impacts from significant traffic congestion during the construction phase. The EJ analysis concludes that traffic impacts would be mitigated to less than significant, however the analysis does not demonstrate this - the roadway section concludes that traffic impacts in the north will not be mitigated to a better than Level of Service (LOS) F (Vol. 6 p. 4-60). Therefore, the public health impacts from vehicle exhaust, especially with the use of high-sulfur fuel, should be disclosed for populations proximate to these congested roadways and intersections. There is evidence that environmental justice communities are more vulnerable to pollution impacts than other communities. Disadvantaged, underserved, and overburdened communities are likely to have pre-existing deficits of both a physical and social nature that make the effects of environmental pollution more, and in some cases, unacceptably, burdensome[84]. Also, because

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[81] Executive Order 12898 (Feb. 11, 1994) Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations.
[82] The DEIS does acknowledge in the water utility impact assessment that potential water shortfalls would probably fall disproportionally on the low income and poor (Vol 6, p. 3-48), but the EJ analysis in Chapter 20 of Vol 6 does not include this impact, nor any other stresses to utilities.
[83] The DEIS states that the racial minorities and low-income populations in the northern Dededo and northern Yigo that live near Routes 3 and 9 would be disproportionately impacted by increased traffic (Vol. 2, p. 19-13), and that those living near Route 3, Route 10 north of Route 32 to Route 8, Route 15 at its intersection with Route 10, Route 16, Route 25, Route 26, and Route 28 would experience significant traffic impacts (Vol. 2, p. 19-15).
[84] EPA's *Framework for Cumulative Risk (www.epa.gov/OSA/raf/publications/pdfs/frmwrk_cum_risk_assmnt.pdf)* and the *National Environmental Justice Advisory Council's (NEJAC) Ensuring Risk Reduction in Communities with Multiple Stressors: Environmental Justice and Cumulative Risks/Impacts (www.epa.gov/compliance/resources/publications/ej/nejac/nejac-cum-risk-rpt-122104.pdf)*

Guam has a higher percentage of children (34 – 38%) than the U.S. average (21%), it is important to consider the increased impacts these air pollutants can have on children. Children are believed to be especially vulnerable due to higher relative doses of air pollution, smaller diameter airways, and more active time spent outdoors and closer to ground-level sources of vehicle exhaust[85]. There is no mention of these health impacts to EJ populations or children in the EJ analysis or the larger DEIS, save for some generic statements in the public health chapter.

The noise impact assessment did not appear to consider the cumulative increases in noise from the Mariana Islands Range Complex (MIRC) training increases which will occur in some of the same locations on Guam. Noise impacts are dismissed as less than significant, while acknowledging a probable increase in the number of complaints and people annoyed (Vol. 2, p. 6-25). However, there are well known health impacts from noise which are not acknowledged[86].

Increases in stress as a result of traffic congestion and the additional noise during both construction and operation phases can cause health impacts in some populations[87]. Guam is currently designated a Medically Underserved Area (Vol. 2, p. 18-4). The induced growth from the project will result in an even greater disparity between people and health services, with more people accessing already limited services. While these impacts on the health care system are acknowledged, how these impacts will translate to public health are not. Indeed, all potential public health impacts identified in Volume 2, Chapter 18 should be acknowledged as affecting a medically underserved EJ population (explosives safety, notifiable diseases, mental illness, and traffic accidents, etc.). Finally, the sociocultural issues, which "have attracted much public attention and comment" (Vol. 2, p. 16-40) including Chamorro issues and threats to community cohesion, are a serious concern to the public.

The DEIS identifies most of these impacts as less than significant or mitigable to less than significant without basis. Collectively, however, and considering the vulnerability of the population, these impacts must be considered significant. For mitigation, the DEIS states only that DoD is committed to working with Guam and the full array of federal executive agencies to identify potential sources of funding. Given the historic low-level of federal funding in Guam, and the recognition that Guam's unique circumstances and world economic conditions may make it difficult for Guam to address mitigation on non-DoD lands using normal revenue sources (Vol. 7, p. 2-30), a substantially more developed mitigation strategy is necessary to avoid significant adverse impacts to EJ populations.

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[85] See: http://hydra.usc.edu/scehsc/coep/coep_atlaschap.asp. In addition, several researchers have identified impacts of traffic to children. See: (1) Delfino, RJ et al. 2009. "Repeated hospital encounters for asthma in children and exposure to traffic-related air pollution near the home Annals of Allergy, Asthma & Immunology, 102(2):138-44; (2) McConnell, R. et al. 2006. "Traffic, susceptibility, and childhood asthma". Environ. Health Perspectives 114(5): 766-72

[86] See Goines, Lisa RN and Hagler, Louis MD. "Noise Pollution: A Modern Plague", *Southern Medical Journal*: March 2007 - Volume 100 - Issue 3 - pp 287-294. According to the authors, the potential health effects of noise pollution are numerous, pervasive, persistent, and medically and socially significant.

[87] See Gee GC, and Takeuchi DT.. "Traffic stress, vehicular burden and well-being: a multilevel analysis." Soc Sci Med. 2004 Jul;59(2):405-14. Also Peters A, von Klot S, Murray A, et al. "Exposure to Traffic and the Onset of Myocardial Infarction". *New England Journal of Medicine*, Vol. 351, No. 17. 21 October 2004.

Recommendation: We recommend substantially improving the EJ analysis and developing a mitigation strategy. The improved analysis should identify the impacts identified above and to discuss impacts from multiple stressors cumulatively and in terms of human health and well-being. Include results of any additional analysis being conducted, such as the additional MSAT analysis (Vol. 6, p. 7-4), which could potentially identify hotspots near EJ communities. Mitigation to reduce pollutant exposure to EJ communities should be identified in the FEIS with a commitment strategy to implement the measures in the ROD.

For significant impacts to public health infrastructure and social services, EPA recommends that DoD lead efforts to develop a specific multi-party (DoD, Gov Guam, other federal agencies) cost-sharing agreement to fund necessary civilian infrastructure improvements in time to influence the Fiscal Year 2012 federal budget. The cost estimate should be based on the best available estimates at the time for both capital investments and operation and maintenance. The agreement should be included in the FEIS and include a priority list of projects, timeline for funding, and specific agency commitment levels. This recommendation is consistent with the potential mitigation measures identified in Volume 7, Table 2.2-1.

To determine federal funding commitment levels DoD should take the lead to determine 1) what civilian infrastructure funding needs can be met through existing federal funding programs, 2) what leveraging opportunities exist to maximize available funding, 3) the funding gap between the Gov Guam's needs and funding availability, and 4) options for meeting the funding gap; this should include alternative funding mechanisms to improve Gov Guam's ability to leverage private capital and float bonds. EPA and DOI have completed several analyses of financing mechanisms that could support infrastructure improvements throughout all insular territories, including Guam. EPA can also continue to support DoD with technical studies that will help refine overall needs and costs.

VII. NOISE IMPACTS

The DEIS appears to underestimate the significance of noise impacts. The noise impacts from the Anderson AFB ISR Strike DEIS alone were substantial, with that analysis showing that 2,310 people off-base will be exposed to sound 65 dBA (A-weighted sound level measured in decibels) and above, with 552 potentially highly annoyed by the change, representing roughly ten times more people experiencing these impacts that at present). The Guam and CNMI Military Relocation DEIS assumes these ISR Strike impacts in the baseline, however these impacts have yet to occur[88]. It is also unclear whether the analysis includes the activities of the Mariana Islands Range Complex (MIRC) training increases in this noise baseline[89]. This action is still in

[88] The DEIS states that the ISR Strike Capability would be completed prior to implementation of the proposed action in this EIS (Vol 2, p. 6-7).

[89] Vol 1, p. 1-4 states that the Guam and CNMI Military Relocation EIS/OEIS is based upon the assumption that the

the NEPA analysis phase and the increases in training have not yet occurred. It should be clear that the increases from the proposed action are not representing the only increases over the current noise conditions, especially since these impacts were not discussed in the noise cumulative impact assessment[90]. The DEIS also uses this baseline comparison as the basis for determining less than significant impacts.

The analysis calculates the number of acres that will experience increases in noise impacts for ongoing operations, but does not translate this into an estimate of the number of individuals that will be affected (as the Anderson AFB ISR Strike DEIS did effectively), so the extent of noise impacted individuals is not known. The acreage affected by airfield activities at Anderson AFB and vicinity shows for land *outside* of Anderson AFB, 7 acres of additional land will experience 80-85 dBA noise, 107 acres will experience between 75-80 dBA, 265 additional acres will experience from 70-75 dBA, and 727 off-base acres from 65-70 dBA. The significance determination for airfield operations (Vol. 2, p. 6-22) was supposed to assess the increase in incompatible sensitive noise receptors under noise contours to capture areas where there would be "high annoyance" effects. The DEIS identifies that noise exposure greater than 65 dBA DNL is considered generally unacceptable over public services or residential, cultural, recreational, and entertainment areas[91]. There are no conclusions as to how many additional off-base receptors would experience significant impacts (levels greater than 65 dBA DNL) or what mitigation measures could reduce these impacts.

There is no noise assessment for the operation of the combustion turbines. The DEIS states that since the project will only be reconditioning existing turbines, the expected sound levels would be the same, therefore there would be no new noise impacts (Vol. 6, p. 8-7). However the turbines are not currently operational so the project would result in additional noise over the existing condition. These noise impacts should be identified and assessed.

For the construction phase, noise impacts of the new base construction could result in residences receiving higher than 75 dBA Equivalent Sound Level (L_{eq}) EPA acceptable levels for construction (Vol. 2, p. 6-30), but the document concludes impacts are less than significant because sound barriers and sequencing of equipment would reduce these impacts, without any discussion as to the expected sound reductions that are reasonably expected to occur with these measures.

MIRC EIS preferred alternative represents existing or baseline conditions of training in the MIRC through 2015, but it is not clear whether the noise analysis specifically included it. The MIRC preferred alternative involves increases in training over existing conditions.

[90] The DEIS cumulative impact assessment concludes that additive impacts are low because noise impacts are by nature localized, but they are localized in some of the same areas amongst different projects. The conclusion that the degree of additive noise from the project is low, is not substantiated (Vol 7, p. 4-24), especially since the project will result in significant noise impacts (Vol 7, p. 3-76).

[91] We note that EPA identifies a day-night average sound level (DNL) of 55 dBA as protective for sensitive areas including residences, schools and hospitals - See "Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety," EPA/ONAC 550/9-74-004, March, 1974. http://nonoise.org/library/levels/levels.htm

Recommendation: We recommend the noise analysis be amended so it is clear what baseline noise is included and whether this noise is part of the current condition for the people of Guam. We recommend translating the impacted acreage to numbers of individuals affected, as was done for the Anderson AFB Strike DEIS, and for conclusions to be drawn based on significance levels. Assess the noise impacts from operation of the combustion turbines in the FEIS and identify residences and sensitive receptors that could be impacted by these new noise sources. All discussions that conclude that measures or best practices will reduce impacts should document the expected amount of noise reduction from these measures and identify the number of individuals that will still be significantly affected. Mitigation measures should be proposed for significant impacts. The following should be considered:

- Adding insulation, adding a second window pane or replacing windows with better sound attenuation, sealing gaps or leaks in windows and doors, installing baffles in vents and improving the exterior roofing, consistent with radon safety.
- Retrofitting impacted on- and off-based schools with appropriate measures to achieve the classroom acoustics standard of the American National Standards Institute (ANSI)[92].
- Provide a funding mechanism for off-base residences within 65+ dBA noise contours and other significantly impacted areas, such as the Zone II residential zones near the Route 15 small arms ranges, to be used for noise reduction mitigation measures identified above.

We are also concerned about the potential hearing loss for residents on Anderson AFB that will be exposed to 80 dBA in 2 dormitory buildings. The DEIS concludes this is not significant, but it appears that this is because Anderson AFB Strike impacts and MIRC impacts were part of the baseline "no action" scenario. We recommend noise reduction retrofits for these buildings.

VIII. MITIGATION MEASURES

A. BMPs that avoid or reduce impacts lack commitments as mitigation measures

The DEIS frequently identifies mitigation measures in the impact assessments, but also states in the "potential mitigation" sections and summary tables that no mitigation measures are proposed or warranted. This is a significant cause for confusion since it is unclear if the impact conclusions are considering these mitigation measures or not.

There are also many examples where the use of Best Management Practices (BMPs) is the basis for concluding impacts would not be significant, only to state "no potential mitigation measures"

[92] ANSI/ASA S12.60-2002 (R2009) American National Standard Acoustical Performance Criteria, Design Requirements, and Guidelines for Schools

are warranted because impacts are less than significant[93]. CEQ's definition of mitigation in 40 CFR 1508.20 goes beyond compensatory mitigation and includes measures that avoid, minimize, or rectify impacts, such as the identified BMPs in the DEIS.

The project ROD must have a clear identification of mitigation adopted as part of the project. The ROD must state "whether all practicable means to avoid or minimize the environmental harm from the alternative selected have been adopted, and if not, why they were not" (40 CFR 1505.2 (c)). The CEQ Regulations also state that mitigation established in the EIS and committed to as part of the decision shall be implemented (40 CFR 1505.3). The approach used in the DEIS claims reduced impacts from utilizing BMPs (mitigation), but because BMPs are not referred to as mitigation measures, it is likely that the ROD will not include commitments for their implementation. We are concerned that this practice both invalidates the assessment conclusions, and could result in impacts not receiving mitigation.

B. Conclusions that mitigation measures reduce impacts to less than significant not justified
The DEIS frequently concludes that mitigation measures, including BMPs, would reduce impacts, therefore impacts to a particular resource are less than significant. However, the DEIS rarely provides justification for these conclusions. We provide some specific examples (see comments under Stormwater Discharges, Haputo ERA, Environmental Justice), however all cases of this lack of justification would be too numerous to list.

> *Recommendations:* To comply with CEQ Regulations regarding mitigation and the ROD, the document should use a consistent definition of mitigation to include all practices that avoid or minimize impacts[94]. Thus BMPs and SOPs that accomplish this should be referred to as mitigation. All mitigation/BMPs should be clear identified, and included in the resource summary tables. Provide commitments to implement all mitigation measures, including BMPs, in the ROD and include them in the post-ROD monitoring plan (Vol 7, p. 2-32).
>
> If the EIS makes a finding that a mitigation measure reduces an impact to a level of insignificance, the document should provide a detailed justification of that conclusion. This should include a clear explanation of the assumptions underlying the analysis of mitigation measure effectiveness. The analysis should specifically describe the mitigation measure, identify the source(s) of pollutants that are expected to be affected by the measure, clearly explain how and to what extent the measure will affect the source(s), and identify the basis for the estimate (empirical observations, computer modeling, case studies, etc.). Critical assumptions should be linked to the post-ROD monitoring plan.

[93] For example, in Volume 6, the DEIS states that to reduce significant impacts to soils during construction, the following measures are suggested (1) revegetate as soon as possible after ground disturbance, and (2) minimize construction during times of inclement weather. The DEIS then states that no potential mitigation measures are proposed, and implementation of SOPs and BMPs would minimize impacts to soil resources (Vol 6, p. 5-14). Another example is impacts from increases in hazardous materials and waste. Vol 2, Table 17.2-1 states no potential mitigation measures identified, however, Table 17.2-3 lists several BMPs and Standard Operating Procedures (SOPs) that the DEIS claims would result in no significant impacts (Vol 2, p. 17-40).
[94] We recommend using the definition in 40 CFR 1508.20.

For mitigation measures/BMPs that are asserted to reduce impacts to less than significant, the FEIS should include:

- A description of each mitigation measure adopted by the lead agency.
- The party responsible for implementing each mitigation measure.
- A schedule for the implementation of each mitigation measure.
- The agency or entity responsible for monitoring mitigation measure implementation.
- Criteria for assessing whether each measure has been implemented.
- Enforcement mechanism(s).

IX. ADAPTIVE MANAGEMENT

Because of the potential for significant impacts to various utility resources, the DEIS presents an adaptive management technique that could be "applied as mitigation in all resource areas and used as an environmental planning-based approach that allows for adjusting program management/implementation strategies in response to actual monitoring of significantly impacted resource areas. By applying the adaptive management methodology, the Navy would monitor the impacts of its actions and evaluate the need to adjust its plan to implement the selected alternative plans to avoid and/or minimize environmental impacts" (Vol. 7, p. 2-31).

The presentation of this mitigation strategy is very conceptual and not well developed. While this approach is a different application of adaptive management than is customary, the components of an effective adaptive management program remain the same. As stated in the report to the Council on Environmental Quality (CEQ), *Modernizing NEPA Implementation*[95], the effectiveness of adaptive management monitoring depends on a variety of factors including:

a) The ability to establish clear monitoring objectives;
b) Agreement on the impact thresholds being monitored;
c) The existence of a baseline or the ability to develop a baseline for the resources being monitored.
d) The ability to see the effects within an appropriate time frame after the action is taken;
e) The technical capabilities of the procedures and equipment used to identify and measure changes in the affected resources and the ability to analyze the changes;
f) The resources needed to perform the monitoring and respond to the results.

For adaptive management to be considered a valid strategy for mitigating significant impacts, the above points would need to be included and evaluated. The adaptive management strategy in the DEIS simply states that in the event that adaptive management is selected as mitigation it will be included in the post-ROD monitoring plan and would be developed in cooperation with USEPA, GovGuam, GEPA, GWA, and GPA and other agencies as necessary, to identify roles and responsibilities and determine what monitoring criteria and data points will act as indicators of system stress (Vol. 7, p. 2-32). We appreciate being included in the development of this

[95]The NEPA Task Force Report to the Council on Environmental Quality, *Modernizing NEPA Implementation*, September 2003. http://ceq.hss.doe.gov/ntf/report/pdftoc.html

strategy, but it does not appear that DoD has considered the magnitude of developing such an effort and whether there is sufficient time to convene the necessary parties, determine and obtain the needed monitoring capabilities, and develop and administer the program. Additionally, the needed participation of the local agencies would most certainly require resource assistance since these agencies are already overburdened. A legal agreement could be necessary to formalize roles and responsibilities. Technical working groups would need to be formed to address monitoring needs and agree on appropriate "tipping points" and "action points". A central computerized data tracking system would likely be needed, and formal communication mechanisms would need to be established for the dissemination of monitoring results. Authorities would need to be identified regarding decision-making, especially when there are uncertainties, and, should all parties not be in agreement regarding decision-making, a dispute resolution procedure established.

We agree with the *Modernizing NEPA* report that funding to implement the adaptive management approach and the commitment to specific responses is critical. The NEPA process should identify the additional expenses associated with the adaptive management approach to ensure that funding needs for monitoring as well as for any adaptive measures are considered and reflected in the decision documents[96].

Also at issue is the ability to monitor specific effects, and the ability to see changes within an appropriate time frame after the action is taken (item "d" above). There is a dynamic element to such a complex system as population growth, development and resource use that may not be predictable. Once the detailed adaptive management program is fully developed and includes the information listed above, then an evaluation would need to occur to assess the effectiveness and ability of the program to mitigate significant impacts in relation to the project timeframe. The DEIS already identifies limitations to altering the construction tempo, stating that certain levels of impact to the construction tempo "would likely not be acceptable" (Vol. 7, p. 2-45).

> *Recommendation:* The conceptual adaptive management plan included in the DEIS is not sufficiently developed to constitute a valid mitigation proposal. Therefore, EPA recommends against proceeding with this mitigation proposal unless it is fully developed and evaluated for potential effectiveness by all parties. Since it does not appear there is sufficient time to develop and evaluate this proposal before construction, we recommend that only those project components vital to the Marine relocation occur in the interim timeframe (i.e. postpone the CVN berth project components and other project components that are not time-critical) to reduce the number of construction workers needed on the island in the same time frame. Additionally, the potential mitigation identified in Volume 7 that would limit the number of workers and dependents should be implemented at startup. These include: (1) prohibiting dependents from accompanying Marines until construction is complete; and (2) incentivizing construction to reduce on-island construction workforce requirements by using off-island prefabrication techniques, and (3) sequencing labor intensive construction activities in such a way to reduce the peak construction workforce needs (Vol. 7, p. 2-28, 2-26). To protect public health, the

[96] See Sect 4.2.2. Adaptive Management Concerns of *Modernizing NEPA Implementation*

drinking water supply, and water resources from wastewater contamination, DoD must ensure that there is a robust and effective mitigation strategy in place before proceeding with project construction at the scale identified in the DEIS.

That said, we offer the following input on specific resources sections of the adaptive management discussion of the DEIS.

Potable Water Supply and Aquifer Management: Accurate data and a reliable hydrologic model are needed for comprehensive and adaptive management of these resources. The primary strategy for assessing the potential for saltwater intrusion due to the increased pumping of the NGLA is monitoring for chloride content, and then adjusting pumping rates. The presence of chloride content may be a point of irreversible damage to the aquifer due to saltwater intrusion. Guam is already experiencing the effects of salt water intrusion, and once the aquifer is tapped to meet the increased demand, particularly in the short term due to the construction efforts, the protection of the aquifer cannot be assured, especially without a comprehensive aquifer management strategy in place. If adaptive management strategies will be used to address peak water demand during the construction phase, actions should be identified that, if implemented early enough, will ensure protection of the aquifer.

Air Quality: The proposed air quality "action point" or "tipping point" would relate to power consumption and include testing for fuel sulfur content, weekly monitoring for opacity, and a continuous monitoring system to monitor fuel consumption and the ratio of water-to-fuel being fired in the combustion turbines. These monitoring points for air quality are not sensible as they do not relate to public health. The adaptive management monitoring points should directly relate to human health impacts. For example, monitoring for PM2.5 by congested traffic roadways and intersections and PM10 and PM2.5 at construction sites is recommended as an appropriate measure. The NAAQS should be used as the “tipping point” for criteria pollutant monitoring results to trigger construction tempo reductions.

X. CUMULATIVE IMPACTS

Cumulative impact assessment is important for understanding the context for the project's direct and indirect impacts. It offers the analysis from the perspective of the affected resource and the ability of that resource to withstand the impacts from the proposed project when combined with the effects of other present and reasonably foreseeable future actions as well as past actions that have impacted the resource and have resulted in the existing condition.

We understand that devising a cumulative impact assessment methodology is not an easy task. EPA emphasized the importance of this analysis and offered a suggestion for methodology in our scoping comments (May 21, 2007), as well as in our cooperating agency comments on the Description of Proposed Action and Alternatives (DOPAA)(May 15, 2008). In both cases, we suggested consulting a methodology jointly developed by the California Department of

Transportation, EPA, and FHWA[97]. While this was prepared for transportation projects in California, its principles and 8-step process can be applied to other types of projects, and we believe it is a useful resource to consult when analyzing cumulative impacts for a project.

The cumulative impact assessment in the DEIS consists of a lengthy list of past, present and reasonably foreseeable future actions, and one paragraph each that discusses the five resources that the DEIS identifies as receiving adverse cumulative impacts: noise, land use/ownership, terrestrial biology, utilities and roadways, and socio-economics (Vol. 7, p. 4-20). The project list in Table 4.3-3 is more useful in that it indicates which resources are affected by the most relevant cumulative actions, with the number of projects affecting each resource totaled, suggesting that this may be an indicator of the magnitude of the cumulative project impact on that resource. No further discussion of magnitude of cumulative impacts is included. The list also includes a determination for each resource as to whether the "preferred alternative's impacts may be additive to cumulative project impacts", and then if the answer was yes, determined whether the additive impact was low, moderate or strong. No criteria were provided to identify how these determinations were made.

This methodology does not consider the resource and its ability to withstand impacts from multiple sources, which is the goal of a cumulative impact assessment. Because it only discusses resources it deems significantly impacted from the proposed project, it excludes assessments of resources that could be cumulatively impacted from individually minor but collectively significant actions taking place over a period of time (40 CFR 1508.7). While in some cases it may be reasonable to limit a detailed cumulative impact analysis to only those resources that will be significantly impacted by the project, we believe the DEIS does not fully identify all potentially significant impacts in the main analysis[98], so this deficiency is transferred to the cumulative impact assessment. Even within the confines of this methodology, there is insufficient discussion to constitute a complete cumulative impact assessment.

The DEIS states that the cumulative impact assessment is consistent with the CEQ guidance *Considering Cumulative Effects Under the National Environmental Policy Act* (herein CEQ Handbook) (Vol. 7, p. 4-1) and identifies where each CEQ step is represented in the DEIS volumes. However, these referenced discussions are not consistent with the CEQ Handbook, specifically:

- **The DEIS/cumulative impact assessment does not identify the significant cumulative effects issues associated with the proposed action and define the assessment goals (CEQ Step 1).** The DEIS states that the number of cumulative projects that are identified as affecting each resource may be an indicator of the magnitude of the cumulative project impact on that resource. "Water / Wetlands" were affected by the largest number of projects yet these resources were not identified and evaluated for cumulative effects. The DEIS acknowledges that coral reef ecosystems have declined significantly since the

[97] See http://www.dot.ca.gov/ser/cumulative_guidance/purpose.htm

[98] See comments on air impacts from combustion turbines, coral reef ecosystem impacts, environmental justice, among others.

1960's, decreasing from over 50% to less than 25% (Vol. 2, p. 11-13). EPA has identified concern for this resource in our scoping comments and in comments and in our cooperating agency review of the early release DEIS, but coral reef ecosystems were not assessed for cumulative impacts. (See comment on Cumulative Impacts to Coral Reefs)

- **The DEIS/cumulative impact assessment does not evaluate resources within an expanded geographic scope and the time frame as appropriate for a cumulative impact analysis (CEQ Steps 2&3).** The DEIS states that the geographic boundaries for the cumulative impact assessment are expanded to island-wide (Guam and Tinian), and timeframe is expanded to three years before the proposed action (2004) through five years after the completion of construction (2019). (Vol. 7, p. 4-1). However there is no substantive discussion of any particular resource in a larger geographic boundary or time period. For terrestrial and marine biological resources, a geographic boundary corresponding to specific resource ranges and habitats would be appropriate.
- **The DEIS/cumulative impact assessment does not characterize resources in terms of their responses to change and capacity to withstand stresses (CEQ Step 5**). This was not discussed for any resources from a cumulative impact perspective.
- **The DEIS/cumulative impact assessment does not determine the magnitude and significance of cumulative effects on the resources (CEQ Step 9).** The cumulative impact assessment states that no attempt was made to distinguish between less than significant and significant adverse impacts (Vol. 7, p. 4-20). The CEQ Handbook states that the analyst's primary goal is to determine the magnitude and significance of the environmental consequences of the proposed action in the context of the cumulative effects of other past, present, and future actions (CEQ Handbook p. 41).

Finally, there is no substantial discussion of the cumulative impacts to resources from climate change (See also comment under "GHG emissions and Climate Change"). Small islands like Guam and Tinian are considered among the most vulnerable to climate change because extreme events have major impacts on them. Changes in weather patterns and the frequency and intensity of extreme events, sea-level rise, coastal erosion, coral reef bleaching, ocean acidification, and contamination of freshwater resources by salt water are among the impacts small islands face.[99]

> *Recommendation:* EPA recommends improving the cumulative impact assessment by expanding the discussion of those five resources it deems significant for cumulative impacts, and by adding a new component to the methodology that will expand the analysis to include additional resources that will be impacted by the project and that are cumulatively impacted. We recommend these resource discussions include, but not be limited to: Coral reef ecosystems; Coastal Water Quality; Groundwater Quality and Quantity[100]; Air quality; Marine Biological Resources; Terrestrial Biological Resources; Noise; Recreation Resources; Socioeconomics/EJ. We continue to recommend the California Department of Transportation methodology identified above to improve the methodology for assessing cumulative impacts.

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[99] http://downloads.globalchange.gov/usimpacts/pdfs/islands.pdf
[100] See comment under Cumulative Impacts to Water Resources

The improved analysis should characterize the resources, ecosystems, and human communities in terms of their responses to change and capacity to withstand stresses, including those from climate change, and include regulatory thresholds when applicable. For resources that are cumulatively impacted and project impacts are not deemed less than significant (taking into consideration public and expert agency comment), mitigation measures should be identified, consistent with CEQ Guidance Step 10.

XI. BIOLOGICAL RESOURCES

A. Invasive Species

In our scoping comments, EPA identified concerns with invasive species introduction as a result of the build-up and the need for control and inspection of the invasive Brown Tree Snake (BTS) to prevent its spread to other islands including Tinian. Part of this control involves the eradication of the BTS population, consistent with public law 110-417, [div. A], title III, Sec. 316, Oct. 14, 2008,122 Stat. 4410[101]. A final Biosecurity Plan will not be available until after the ROD is signed and no interim measures are identified that will be in place at the start of construction, nor specific commitments regarding what efforts DoD will take to ensure the BTS will not spread to other locations, and that aquatic invasive species are prevented from entering Guam and Tinian.

Recommendation: In lieu of a final biosecurity plan, interim biosecurity measures should be in place at the start of construction and the FEIS should identify these measures and provide an update on the final biosecurity plan and DoD commitments to its implementation. We would also recommend a contingency plan be established for compensation for environmental impacts should the BTS become established on Tinian. The extent of travel between Guam and Tinian necessitates this kind of contingency planning, including a legally-binding agreement for restoration.

B. Disclosing Vegetation Impacts

The DEIS states that temporary rather than permanent loss of vegetation would occur for the Main Cantonment alternatives and that these alternatives would result in little change to the landscape of the affected area (Vol. 2, p. 3-33). This statement is repeated for loss of vegetation for the FAA parcel and Harmon Annex (Vol. 2, p. 3-37). This is obviously an error since the DEIS identifies the loss of over 1,000 acres of limestone forest, and almost 500 acres of other vegetation for the development of the Main Cantonment (Vol. 2, p. 10-98).

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[101] This law states that "The Secretary of Defense shall establish a comprehensive program to control and, to the extent practicable, eradicate the brown tree snake population from military facilities in Guam and to ensure that military activities, including the transport of civilian and military personnel and equipment to and from Guam, do not contribute to the spread of brown tree snakes."

XII. OFF BASE ROADWAY PROJECTS

Description of Proposed Off base Road Projects (Haul Road Network) and Construction
The DEIS identifies 58 transportation projects (43 off base and 15 intersection improvements at military access points) in its analysis, although only general descriptions of the projects and "typical construction activities" are given. EPA believes the following additional information is necessary to adequately assess potentially significant environmental impacts of these proposed roadway projects:

- ***Construction Activities:*** *Describe specific construction activities (e.g., equipment and trucks needed, dewatering, grading, fill, etc.) for proposed transportation projects, including construction and equipment staging areas and related impacts associated with these sites.* To adequately assess impacts to affected community or biological resources, the document should describe <u>how</u> construction will occur and identify specific construction and equipment staging areas when they are likely to occur outside of the footprint of the proposed transportation projects.
- ***Transportation Alternatives:*** *Identify whether any of the 58 proposed road projects within the four composite alternatives may warrant additional avoidance or minimization measures to a specific resource, such as neighboring high quality wetlands. Include additional alternatives or considerations for these specific road projects in the FEIS.* The description of transportation alternatives describes four composite alternatives associated with the Guam military buildup and identifies a list of road projects associated with each composite alternative. There is no discussion of whether these specific projects will require additional, project-level alternatives to reduce resource impacts.
- ***Site-specific Analysis:*** *Include site and project specific resource information for proposed transportation projects, particularly projects that will occur in or adjacent to areas of sensitive biological resources, including wetlands and significant habitat areas, and sensitive receptors, such as hospitals or schools. Expand the analysis to include an assessment beyond simply identifying impact acreages by further describing the functions and values that would be lost or degraded for each affected resource, including indirect impacts (e.g. impacts downstream of construction activities).* Several of the analyses for resources include broad, programmatic statements of possible resource impacts from the proposed transportation projects. See also comments under Impacts to Wetlands.