APPENDICES

Draft

Environmental Impact Statement for F-15 Beddown and Infrastructure Upgrades at Andersen Air Force Base, Guam

Department of the Air Force

June 2024

PRIVACY ADVISORY

This Draft Environmental Impact Statement (EIS) has been provided for public comment in accordance with the National Environmental Policy Act (NEPA), Council on Environmental Quality NEPA Implementing Regulations (Title 40 Code of Federal Regulations [CFR] Parts 1500–1508), and Environmental Impact Analysis Process (EIAP) (32 CFR Part 989). The EIAP provides an opportunity for public input on United States Department of the Air Force (DAF) decision making, allows the public to offer input on alternative ways for DAF to accomplish what it is proposing, and solicits comments on DAF's analysis of environmental effects.

Public input allows the DAF to make better-informed decisions. Letters or other written or verbal comments provided may be published in this EIS. Providing personal information is voluntary. Private addresses will be compiled to develop a stakeholders inventory. However, only the names of the individuals making comments and their specific comments will be disclosed. Personal information, home addresses, telephone numbers, and email addresses will not be published in this EIS.

Section 508 of the Rehabilitation Act of 1973

The digital version of this EIS and its project website are compliant with Section 508 of the Rehabilitation Act of 1973 because assistive technology (e.g., "screen readers") can be used to help the disabled understand these electronic media. Due to the nature of graphics, figures, tables, and images occurring in this document, accessibility may be limited to a descriptive title for each item.

Information regarding the Draft EIS is available on the project website at
www.AAFBInfraAndF15EIS.com

Comments on the Draft EIS can be submitted at that website or sent via email to:
afcec.aafb.infrasandf-15eis@us.af.mil
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APPENDICES
Appendix A: Public Scoping Comments

ENVIRONMENTAL IMPACT STATEMENT for
F-15 BEDDOWN and INFRASTRUCTURE UPGRADES
at ANDERSEN AIR FORCE BASE, GUAM

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Appendix A: Public Scoping Comments

Tables

Abbreviations and Acronyms

AFB	Air Force Base
DAF	Department of the Air Force
EIS	Environmental Impact Statement
NOI	Notice of Intent

Appendix A: Public Scoping Comments

Scoping is conducted in accordance with the National Environmental Policy Act to involve the public early in the environmental planning process, and to solicit input from the public and interested agencies on the nature and extent of issues and impacts to be addressed and the method by which potential impacts are evaluated. The Department of the Air Force (DAF), and the United States Navy acting as a cooperating agency, initially issued a Notice of Intent (NOI) on April 20, 2021, to prepare an Environmental Impact Statement (EIS) for Infrastructure Upgrades at Andersen Air Force Base (AFB), Guam (Vol. 86, No. 74, *Federal Register*, 20487, April 20, 2021). The initial NOI marked the start of the scoping period, which was conducted from April to May 2021.

Following the initial scoping period, the DAF placed the EIS on a strategic pause to further consider the scope of the EIS, including evolving strategic initiatives in the Indo-Pacific and how the Proposed Action could best support these initiatives. Following the strategic pause, the DAF revised the scope of the Proposed Action to include the beddown of up to 12 Republic of Singapore Air Force F-15 fighter aircraft and associated mission support. On December 15, 2023, the DAF reissued an NOI and initiated an additional scoping period for the revised Proposed Action for the preparation of the EIS for F-15 Beddown and Infrastructure Upgrades at Andersen AFB, Guam (Vol. 88, No. 240, *Federal Register*, 86884, December 15, 2023). The additional scoping period was conducted from December 2023 to January 2024.

Section A-1 includes the scoping comments from the initial scoping period (April to May 2021). **Section A-2** includes the scoping comments from the additional scoping period (December 2023 to January 2024).

A-1. Initial Scoping Period (April to May 2021)

In total, six comment correspondences were received during the initial public scoping period from two federal agencies, three Guam agencies, and one member of the public. No comments were received from federal and Guam political representatives or non-governmental organizations. One comment correspondence was received from an individual who submitted comments via the website three times, one comment correspondence was received via postal mail, and four comments correspondences were received via email. Comment correspondences are broken down by the individual comments they contain and presented below.

A-1.1 Scoping Comments and Responses

Table A-1 provides the initial scoping comments and responses, received during the initial scoping period between April and May 2021.

Table A-1 Initial Scoping Comments and Responses

Contact Type	First Name	Last Name	Organization	Comment	Response
Federal Agency	Karen	Vitulano	Environmental Protection Agency (EPA)	We have the following suggestions for your consideration when preparing the Draft Environmental Impact Statement (DEIS): Project scope – The project website states that the infrastructure improvements will be "designed to accommodate aircraft types and flight operations that have been addressed under previously prepared NEPA documentation for Andersen AFB, such as bombers, tankers, and fighters". Because of this statement, we assume that the DEIS will cover primarily the construction phase impacts of the improvements; however, the DEIS should clarify whether any new or changed operations are included in the scope of this action, and identify which NEPA documents disclose the operational impacts from utilizing the new infrastructure. Provide easy access to the analyses evaluated in previous NEPA documents, such as providing weblinks to the NEPA documents in the DEIS or on the project website and identifying the specific sections that contain the most relevant analyses, as applicable, to direct the reader. Identify any operational impacts that were not fully addressed in other NEPA documents and ensure they are disclosed in the infrastructure EIS.	Per the comment, the Draft EIS will clarify the scope of operations included in the Proposed Action and incorporate by reference the NEPA documents that address operational impacts. Links to these documents will be provided on the project website.

Contact Type	First Name	Last Name	Organization	Comment	Response
Duplicate	Karen	Vitulano	Environmental Protection Agency (EPA)	Alternatives The NOI indicates that no alternatives to the proposed action, except the required No Action alternative, will be evaluated since "only the Proposed Action locations were determined to meet the criteria for the infrastructure upgrades". The alternatives analysis is of prime importance under NEPA, and the CEQ Regulations make clear that the purpose of an EIS is to "inform decision makers and the public of reasonable alternatives that would avoid or minimize adverse impacts or enhance the quality of the human environment" (40 CFR 1502.1). The CEQ Regulations also state that agencies shall evaluate an alternative which "includes mitigation measures not in the proposed action" (40 CFR 1501.9(e)(2)). The DEIS should identify the criteria and rationale for determining that no other action alternatives are feasible. For example, the project website states that the "North Ramp project area under the Proposed Action is the only contiguous location adjacent to the airfield capable of meeting the construction footprint selection standards". Explain why all the facilities must be in one contiguous location and examine whether some facilities can be located at another nearby location and serve the project purpose. Additionally, it is not clear if relocating facilities/structures on lands adjacent to the North Ramp site have been explored. We recommend the land uses for disturbed lands east of the North Ramp project site be assessed to determine whether these are underutilized lands that could be utilized for the project site to reduce deforestation. EPA requests that a discussion of this potential alternative be included in the DEIS.	The Draft EIS will identify all selection criteria and alternatives considered, and the rationale for determining that the Proposed Action is the only reasonable alternative.

Contact Type	First Name	Last Name	Organization	Comment	Response
Duplicate	Karen	Vitulano	Environmental Protection Agency (EPA)	Impact assessment methodology The Council on Environmental Quality's (CEQ) updated National Environmental Policy Act Regulations state that the impact assessment shall include the environmental impacts of the action and alternatives and the significance of those impacts (40 CFR 1502.16 (a)(1)). We recommend that the impact assessment methodology be identified for each resource evaluated and include one or more significance thresholds against which project impacts can be compared. This will help interpret the impacts for the reader. The DEIS should identify impacts that occur as the same time and place as the proposed action (direct impacts) as well as those occuring later in time and further removed in distance from the proposed action (indirect impacts) (40 CFR 1508.1).	The impact assessment methodology for each resource area will be included in the Draft EIS, and will include assessment of both direct and indirect impacts.
Duplicate	Karen	Vitulano	Environmental Protection Agency (EPA)	Environmental trends and other planned actions The description of the affected environment should be comprehensive and include reasonably foreseeable environmental trends and planned actions in the area (40 CFR 1502.15). Consider how impacts on resources from the construction and operation of Camp Blaz and other actions on Andersen AFB affect the health and condition of the resource when evaluating impacts from this action. Reasonably foreseeable environmental trends include climate change effects occurring and expected to occur in the project area. While the project sites are above the cliff line, impacts related to sea level rise are relevant. Rising sea levels can cause saltwater intrusion to groundwater systems and coupled with high water levels from tropical and extra-tropical storms, will increase coastal erosion and damage coastal ecosystems and infrastructure. According to the Fourth National Climate Change Assessment,1 sea level rise will disproportionately affect the tropical Pacific and potentially exceed the global average.	The Draft EIS will include reasonably foreseeable actions within the area and will address reasonable foreseeably environmental trends in consideration of the Proposed Action.

Contact Type	First Name	Last Name	Organization	Comment	Response
Duplicate	Karen	Vitulano	Environmental Protection Agency (EPA)	Stormwater/ groundwater impacts The proposed project includes stormwater management infrastructure on 16 acres, and stormwater basins are identified on the site map in the project fact sheet. Please coordinate closely with Guam Environmental Protection Agency (GEPA) on siting and design of the stormwater infrastructure and basins consistent with the CNMI & Guam Stormwater Management Manual2 standards for stormwater best management practices in karst limestone terrain. The Northern Guam Lens Aquifer (NGLA), a designated Sole Source Aquifer, is susceptible to contamination from surface activities (spills, leaks, polluted stormwater runoff) due to the high permeability of the limestone which allows rapid infiltration of rainfall and the large pore size in the limestone formations that allows any contaminants present to reach groundwater, which then flows to marine waters. Include a map showing any sinkholes in the project footprint. Describe the specific low-impact development features that will be incorporated into the project. Identify the required coverage under the National Pollutant Discharge Elimination System (NPDES) construction general permit3 for discharges from construction activities that disturb one or more acres. We recommend the Air Force describe in the DEIS the approach it plans to take to prevent or remove pollutants prior to infiltration into the NGLA instead of simply stating that the project would comply with the construction general permit and CNMI & Guam Stormwater Management Manual.	The Draft EIS will include information on the Stormwater Management Manual, LID features and design elements, plans for the stormwater management infrastructure, the NPDES permit, and mitigation measures for stormwater and groundwater impacts.

Contact Type	First Name	Last Name	Organization	Comment	Response
Duplicate	Karen	Vitulano	Environmental Protection Agency (EPA)	Over-pumping of groundwater also threatens water quality in the NGLA via seawater infiltration, and climate change can exacerbate impacts since, in general, the freshwater lens gets smaller and salinities increase when withdrawal increases, or recharge is reduced during drought. Identify the increased water demand on the NGLA from the project that would result in additional pumping for water use during both the construction and operations phases. Incorporate water conservation measures wherever possible.	The Draft EIS will include information on the proposed construction and operation water usage.
Duplicate	Karen	Vitulano	Environmental Protection Agency (EPA)	Bulk fuel storage and distribution The NOI states that the project includes a “jet fuel receipt, storage, and distribution system extension”. The DEIS should describe how fuels will be stored, transferred, and managed, and address required updates to the spill prevention, control and countermeasure (SPCC) plan as a result of this project component. Because of the importance of the NGLA, maximum integrity management should guide the design and installation of additional bulk fuel storage and distribution systems. Since groundwater would flow towards the ocean at this location and discharge from the freshwater-lens system as diffuse seepage near the coastline4, there is potential to impact surface waters and affect recreational and subsistence fishing offshore in the event of a large spill or leak. We note that the U.S. Department of Transportation’s Pipelines and Hazardous Materials Safety Administration does not inspect pipeline operators or enforce pipeline safety laws and regulations in the Pacific Islands; therefore, the DEIS should briefly describe how the Air Force will ensure pipeline integrity and safety and how the design of the bulk fuel storage system extension will be sufficiently protective of the NGLA and nearshore waters.	The Draft EIS will include information on the proposed fuel systems and mitigation measures for pipeline integrity and safety.

Contact Type	First Name	Last Name	Organization	Comment	Response
Duplicate	Karen	Vitulano	Environmental Protection Agency (EPA)	Terrestrial Resources Large portions of the North Ramp site are vegetated with secondary limestone forest and include the rare tree species Tabernaemontana rotensis. Several past observations of the endangered Mariana fruit bat have also occurred here.5 These resources are being significantly cumulatively impacted and every effort to avoid impacts to these species should be explored and described. It is not clear whether the disturbed land to the east of the proposed North Ramp site could be utilized to reduce the need for further deforestation. See comment under Alternatives above	The DAF is conducting a biological resources survey in the proposed project areas to identify threatened and endangered species. The Draft EIS will include information on the survey and status of the consultation with USFWS. The impacts analysis will include consideration of reasonably foreseeable projects.
Duplicate	Karen	Vitulano	Environmental Protection Agency (EPA)	Cultural Resources The NOI indicates that the Air Force will consult with the State Historic Preservation Officer under Section 106 of the National Historic Preservation Act and conduct cultural resources surveys in the areas proposed for upgrades. Because of the extensive cultural artifacts uncovered during construction of the firing ranges at Andersen AFB and the nearby ancient burial site and village, the Air Force should conduct thorough surveys and anticipate findings. We recommend incorporating additional time in the construction schedule and developing a public communication plan to ensure the public is promptly informed of any findings. We recommend summarizing the findings discovered on Andersen AFB thus far and their importance in the DEIS.	A pedestrian cultural resources survey was previously completed in the proposed North Ramp project area. The DAF is conducting additional cultural survey in the North Ramp area to better define site boundaries and inform eligibility determinations. The DAF also conducted a pedestrian/site determination survey in MSA-1. The Draft EIS will include information on the survey and status of consultation with the SHPO.
Duplicate	Karen	Vitulano	Environmental Protection Agency (EPA)	EPA appreciates the opportunity to comment on preparation of the DEIS. Once the DEIS is released for public review, please send one electronic copy to me at vitulano.karen@epa.gov. If you have any questions, please contact me by email or at 415-947- 4178	Noted.

Contact Type	First Name	Last Name	Organization	Comment	Response
Local Agency	Tyrone	Taitano	Guam Coastal Management Program	The Bureau finds that the proposed activity constitutes a development project in the coastal zone of Guam and is therefore subject to federal consistency review under Section 307(c)(2) of the Coastal Zone Management Act (CMZA), 16 U.S.C. §1456(c)(2). GCMP anticipates its receipt of a consistency determination or negative determination not less than ninety (90) days before the final approval of the activity, unless both the federal agency and GCMP agree to an alternative notification schedule pursuant to 15 CFR §§ 930.35 or 930.36. The federal agency may opt for phased consistency determinations if federal decisions related to the proposed development project will be made in phases based upon developing information that was not available at the time of the original consistency determination. As a federal action which would be subject to federal consistency under the CZMA §307(c)(2), 15 CFR Part 930 Subpart C, and GCMP, the action would be reviewed by GCMP with respect to its effects on the enforceable policies of GCMP, adopted in the Guam Coastal Management Program and Final Environmental Impact Statement and though subsequent Program Changes, to include the program policies of GCMP, which were adopted by Governor of Guam Executive Order 78-37, which contains eighteen (18) policies. The level and standards for the review will be based on the Federal Consistency review process as described in our Procedures Guide for Obtaining Federal Consistency with the Guam Coastal Management Program. An electronic copy of this document can be downloaded at GCMP's Federal Consistency website: https://bsp.guam.gov/federal-consistency-2/. The Bureau respectfully reiterates that final federal agency action shall not be taken sooner than 90 days from the receipt by GCMP of the consistency determination unless GCMP concurs or concurrence is presumed or unless both the federal agency and GCMP agree to an alternative period.	A consistency determination or negative determination will be prepared and provided at the time of the Draft EIS release. The Draft EIS will include information on the CZMA and GCMP.

Contact Type	First Name	Last Name	Organization	Comment	Response
Duplicate	Tyrone	Taitano	Guam Coastal Management Program	Please do not hesitate to contact Mr. Julian Janssen, Federal Activities Planner at 475-9664 or email julian.janssen@bsp.guam.gov or Mr. Edwin Reyes, Coastal Program Administrator at 475-9672 or email edwin.reyes@bsp.guam.gov. Si Yu'os Ma'ase '.	Noted.
Local Agency	Miguel	Bordallo	Guam Waterworks Authority	GWA encourages the U.S. Air Force to consider the following comments as they begin the preparation of the Draft EIS: 1. When discussing the various alternatives, please address water quality of the Northern Guam Lens Aquifer sub-basins within and around AAFB including potential contamination due to the proposed activities.	The Draft EIS will include the information and analysis requested regarding water quality.
Duplicate	Miguel	Bordallo	Guam Waterworks Authority	2. Provide detailed information on each alternative under consideration to ensure that GWA is able to adequately determine the impact to the shared aquifer and GWA's Northern District Wastewater Treatment Plant, which receives wastewater generated on AAFB.	The Draft EIS will include the information and analysis requested regarding project alternatives and wastewater.
Duplicate	Miguel	Bordallo	Guam Waterworks Authority	3. Provide detailed information on the water requirements for the proposed activities and address whether AAFB water system production sources are/will be sufficient or whether water from GWA would be required to meet projected increases water demand for the proposed upgrades. Data related to water withdrawal, including approximate locations of any new production wells with respect to specific shared NGLA subbasins, may be necessary to adequately assess the impact to the overall yield of the NGLA from the increased activity in Northern Guam.	The Draft EIS will include the information and analysis requested regarding water requirements.

Contact Type	First Name	Last Name	Organization	Comment	Response
Duplicate	Miguel	Bordallo	Guam Waterworks Authority	4. GWA currently accepts wastewater from Andersen Air Force Base as domestic wastewater, with pre-treatment required for occasional non-domestic wastewater discharges. Describe in detail if there will be potential increases in the amount of or a change in the composition of the wastewater GWA is expected to receive from the upgraded infrastructure and proposed activities. Certain activities are subject to GWA's Industrial User Pre-treatment Permit depending on the type of activity and the type of discharge. Provide detailed information on the location and types of activities requiring special/non-domestic wastewater discharges, especially with Airfield Infrastructure projects. GWA may require separate oil/water separators or other pre-treatment measures be installed prior to such wastewater entering the sanitary sewer system.	The Draft EIS will include the information and analysis requested regarding wastewater production.
Duplicate	Miguel	Bordallo	Guam Waterworks Authority	5.. Provide sufficient detail on preventative measures to ensure that contaminants such as oils, fuel, and other non-processable chemicals, do not enter into GWA's wastewater collection system. Only domestic wastewater shall be discharged to the sanitary sewer system without an Industrial Pretreatment Permit	The Draft EIS will include the information and analysis requested regarding preventative measures/infrastructure for fuels infrastructure.
Duplicate	Miguel	Bordallo	Guam Waterworks Authority	6.. When evaluating the impact of stormwater, please note that stormwater is prohibited from being discharged into GWA's wastewater collection system. Ensure that stormwater systems are adequately sized to prevent illicit discharges into GWA's wastewater system. Runoff from the washdown areas or other facilities area must not enter GWA's wastewater system. Discharges of storm water or water used for wash downs into the sanitary sewer is prohibited.	The Draft EIS will include the information and analysis requested regarding stormwater and wastewater.
Duplicate	Miguel	Bordallo	Guam Waterworks Authority	Thank you for the opportunity to provide scoping comments in preparation for the Draft EIS for the Proposed Infrastructure upgrades at Andersen Air Force Base, Guam. We look forward to	Noted.

Contact Type	First Name	Last Name	Organization	Comment	Response
Federal Agency	Gregory	Koob	US Fish and Wildlife Service	The U.S. Fish and Wildlife Service, Pacific Islands Fish and Wildlife Office received your correspondence on April 20, 2021 providing notice of intent to prepare an Environmental Impact Statement and conduct public scoping for proposed infrastructure upgrades at Andersen Air Force Base, Guam. Because our office anticipates analyzing the project during consultation under section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.), we have no comments to offer at this time. Thank you for the notice and opportunity to participate in the public scoping process. If you have additional questions regarding this letter, please contact Jacqueline Flores at jacqueline_flores@fws.gov or by telephone at (671) 989-6744.	Noted.
Local Agency	Patrick	Lujan	State Historic Preservation Officer	Thank you for notifying us that the United States Air Force (USAF) intents to prepare an Environmental Impact Statement for Andersen Air Force Base (AAFB) Infrastructure Upgrades. We know that the North Ramp undertaking will cause an adverse effect to historic properties eligible for listing in the National Register of Historic Places. Our office has previously provided AAFB with an adverse effect opinion on the North Ramp area of potential effects (APE) and presented comments on the current "Work Plan for the Archaeological Investigation of the Proposed Infrastructure Upgrades at Andersen Air Force Base, Guam". We copied the Advisory Council on Historic Preservation (ACHP) on our response as it was submitted before we received this notification. We believed the Work Plan lacks a reasonable and good faith effort as we had previously called for a resurvey of the APE.	The proposed Infrastructure Upgrades is a different undertaking than the previously consulted-on undertaking referred to in the comment. Work Plan revisions were made based on SHPO's input and provided back to the SHPO. The DAF will continue to engage in consultation with the SHPO on the proposed Infrastructure Upgrades undertaking.

Contact Type	First Name	Last Name	Organization	Comment	Response
Duplicate	Patrick	Lujan	State Historic Preservation Officer	We look forward to being informed of other alternative locations that the USAF has considered that were reviewed for construction of these facilities. Our office is usually brought in at the beginning of an Environmental Impact Study to review such alternative locations, however, these locations seem to already be discounted and not disclosed. This lack of information sharing is what caused the Supplemental Environmental Impact Statement for the 2011 PA Agreement for the Guam Build-Up.	The Draft EIS will identify all selection criteria and alternatives considered, and the rationale for determining that the Proposed Action is the only reasonable alternative.
Duplicate	Patrick	Lujan	State Historic Preservation Officer	We feel that the USAF should announce their intentions to the public through all forms of the media, with public announcements on the radio, television, and in the newspapers. You should be aware of the publics' interest through the oversight hearing held over the past year with the Guam Legislature. With the adverse effects to historic properties, we feel that a Memorandum of Agreement or a Programmatic Agreement needs to be made in accordance with this undertaking.	The DAF will continue to engage the public throughout the NEPA and Section 106 processes. The DAF looks forward to working with the SHPO through the Section 106 consultation process to determine, based on survey results, the potential for effects on historic properties and whether resolution through an agreement document is necessary.
Duplicate	Patrick	Lujan	State Historic Preservation Officer	We feel the USAF needs to improve their comprehensive communication plan to maximize opportunities for reaching the public and consulting parties on this undertaking, avoiding any problems of intergrading the Section 106 process into the NEPA process. We thank you for the announcement and look forward to hearing from you in the future concerning this undertaking and the NEPA process.	The DAF conducted public scoping remotely in accordance with 40 CFR Part 1506.6. The DAF is aware of the component of public involvement included in the Section 106 process, as outlined in 36 CFR 800. Public scoping announcements also welcomed comments under Section 106 of the National Historic Preservation Act (36 CFR 800) regarding the identification of or effects on historic properties, and requests to become a consulting party in the Section 106 process. In accordance with 36 CFR 800.3(b), The DAF is coordinating the Section 106 process with NEPA.

Contact Type	First Name	Last Name	Organization	Comment	Response
Duplicate	Patrick	Lujan	State Historic Preservation Officer	Should you you have any questions, contact John Mark Joseph, State Archaeologist at JohnMark.Joseph@dpr.guam.gov	Noted.
Public	David	Lotz		I have requested information by mail and have not received it and your email of AAFBInfrastructure.EIS@us.af.mil is not working	Printed materials were sent to Mr. Lotz as requested. The email address was tested and was working for the duration of the scoping period.
Duplicate	David	Lotz		I have not received the requested printed information that i requested three weeks ago and your email does not work.	Printed materials were sent to Mr. Lotz as requested. The email address was tested and was working for the duration of the scoping period.
Duplicate	David	Lotz		You cannot just write off alternatives under NEPA with simple one sentences. Then need to be considered and evaluated in detail. You have not considered any other locations adjacent to the airfield for airfield location infrastructure including the south ramp where the Arc Light memorial was once located that needs to be considered as an alternative location.	The Draft EIS will identify all selection criteria and alternatives considered, and the rationale for determining that the Proposed Action is the only reasonable alternative.

A-2. Additional Scoping Period (December 2023 to January 2024)

A-2.1 Comments Received During Additional Public Scoping Period

During the additional 30-day scoping period conducted from December 2023 to January 2024, a total of 60 comment correspondences from 50 commenters were received. A correspondence may contain one or more separate comments. One correspondence was received via email and 59 were received through the project website. Seven commenters submitted their correspondence two or more times. Identical submissions from the same commenter were counted as one submission. In addition, the content of one comment correspondence was blank (Comment ID = Website-36) and was not counted. Without counting blank or identical comment correspondences from the same commenter, a total of 50 comment correspondences were received during the scoping period.

All correspondences submitted during the scoping period were reviewed and broken down into their individual comments, presented below. During the review of comments, it was determined that 35 comment correspondences contained duplicate content (i.e., a form letter submitted by multiple commenters). Each of these correspondences was given equal weight; however, the content of the correspondence is included in this appendix only once. In total, 15 unique comment correspondences were received during the scoping period.

A-2.1.1 Scoping Comments and Responses

Table A-2 provides scoping comments and responses, received during the additional scoping period between December 2023 and January 2024.

Table A-2. Comments Received During Additional Public Scoping Period

Contact Type	Name	Organization	Comment ID	Theme(s)	Comment	Response
Public	Michael Gawel	N/A	1a	Biological Resources	Please accept and record my comments as a resident of Guam for over fifty years. I have seen and studied the huge impacts of invasive species on the ecology and the people of Guam. I fear that this project will increase risks of introducing more harmful invasive species to Guam, including new diseases of people, plants and animals. Will mitigation or requirements ensure that aircraft entering this facility on Guam will follow strict bio-security procedures?	The Draft EIS will include information and analysis regarding invasive species. The Armed Forces Pest Management Board coordinates DoD activities to prevent and control the spread of invasive species, on, to, or from military bases. The DAF would require the construction contractor the implement a Hazard Analysis and Critical Control Point to ensure protocols are in place to prevent or minimize the introduction of invasive species to the project areas.
Duplicate	Michael Gawel	N/A	1b	Biological Resources	Will aircraft be required to pass inspection and controls for invasives at their last point of departure before flying to Guam?	The Draft EIS will include discussion of invasive species and the bio security measures that will be implemented at Andersen AFB to prevent their spread to the installation.
Duplicate	Michael Gawel	N/A	1c	Biological Resources	Will they be quarantined on arrival until inspected for invasives and any invasives found be destroyed?	The Draft EIS will include discussion of invasive species and the measures that will be taken to identify and destroy such species to prevent their spread to Andersen AFB.
Duplicate	Michael Gawel	N/A	1d	Other	Thank you for this opportunity to comment on scoping and please inform me when a Draft EIS on this project is available for review. Michael Gawel	Comment noted.

Contact Type	Name	Organization	Comment ID	Theme(s)	Comment	Response
Federal Agency	Sean Hanser	NMFS Pacific Islands Regional Office, Habitat Conservation	2a	Biological Resources	Aside from concerns about Endangered Species Act-listed species, NMFS is also concerned with the protection of Essential Fish Habitat (EFH) under the Magnuson–Stevens Fishery Conservation and Management Act. We can see from the NOI that the planned changes are not near the marine environment, therefore the primary concern NMFS would like to see addressed for EFH is nearshore water quality.	The Draft EIS will include information and analysis regarding nearshore water quality and an EFH assessment.
Duplicate	Sean Hanser	NMFS Pacific Islands Regional Office, Habitat Conservation	2b	Water Resources	Elements of stormwater management and low impact design appear to be considered in the initial designs for proposed action.	The Draft EIS will include information on stormwater management, low impact development requirements, and stormwater impact minimization measures.
Duplicate	Sean Hanser	NMFS Pacific Islands Regional Office, Habitat Conservation	2c	Geological Resources	NMFS reminds the DAF that the karst geology of Guam is porous and allows water to recharge the freshwater aquifer quickly with little filtration. That aquifer water is discharged from the island into the nearshore marine environment. The Water and Environmental Research Institute of the Western Pacific (WERI) at the University of Guam studies and has significant resources available on the groundwater dynamics of Guam. Please be sure to check with them for the latest information on sinkhole distribution, geophysical structure, and groundwater dynamics of northern Guam. Also, please explain in the EIS how the design of the project takes into account the geological structure and flow dynamics of the project site.	The Draft EIS will include information and analysis on the geology and soils of the project areas. Geotechnical investigations will be completed prior to any construction. The EIS will identify the permit requirements that will be implemented to reduce impacts on underlying groundwater.

Contact Type	Name	Organization	Comment ID	Theme(s)	Comment	Response
Duplicate	Sean Hanser	NMFS Pacific Islands Regional Office, Habitat Conservation	2d	Biological Resources	NMFS recommends that DAF plan on conducting an EFH consultation with NMFS for the proposed action.	The Draft EIS will include information on EFH near the project areas and will provide an EFH assessment.
Duplicate	Sean Hanser	NMFS Pacific Islands Regional Office, Habitat Conservation	2e	Alternatives	Also, please be sure to explain in the EIS all alternatives for siting the project and why the preferred alternative was chosen. An EIS with only an already-decided siting for a single alternative and a no-action alternative has difficulty receiving approval from agencies such as the USEPA.	The Draft EIS will identify all selection criteria and alternatives considered, and the rationale for determining that the Proposed Action is the only reasonable alternative.
NGO	[blank]	Prutehi Litekyan - Save Ritdian	3a	Scoping/ Alternatives	Prutehi Litekyan - Save Ritdian A Direct-Action Group Litekyan.opa@gmail.com January 15, 2024 Via Comment Portal: https://www.aafbinfraandf15eis.com Re: Prutehi Litekyan Save Ritidian Comment for the Environmental Impact Statement F-15 Beddown and Infrastructure Upgrades at Andersen Air Force Base, Guam Hafa Adai:On behalf of Prutehi Litekyan: Save Ritidian (PLSR), we submit the following comments on the proposed F-15 Beddown and Infrastructure Upgrades at Andersen Air Force Base, Guam. PLSR vehemently opposes this proposed project and the many adverse impacts it will have to our island and people.	The Draft EIS will identify all selection standards and alternatives considered, and the rationale for determining that the Proposed Action is the only reasonable alternative. No scoping meetings were conducted while the EIS process was paused. When the EIS process was resumed, the DAF conducted an additional virtual public scoping period from December 2023 to January 2024. Additional public engagement and outreach opportunities will be considered when the Draft EIS becomes available for public review.

Contact Type	Name	Organization	Comment ID	Theme(s)	Comment	Response
Duplicate	[blank]	Prutehi Litekyan - Save Ritdian	3a	Scoping/ Alternatives	We must measure the serious risks associated with an increased military presence against a long established legacy of colonial violence and environmental racism, and the numerous and enduring environmental injustices and violations of our human and Indigenous rights we continue to face, including but not limited to the loss of access, the destruction of native species, numerous cases of substantial contamination, and severe desecration of sacred sites and ancestral remains, all still occurring at several military construction and operation sites around the island. Our submission in opposition to the F-15 Beddown and Infrastructure Upgrades at Andersen Air Force Base is centered on the following issues: Critique on the Scoping Process - There has been a severe lack of public engagement in the scoping process reflecting a lack of free, prior, and informed consent. Several Possible Impacts on Vital Resources, Community – environmental, cultural, and social. Safety and Security – Positioning Guam to be a “first strike community” and “collateral damage” in a conflict of imperial powers, impacting overall sovereignty. Established in 2017, PLSR is a community-based organization dedicated to protecting and preserving the natural and cultural resources of Guam. This includes the areas proposed to be used for relocating U.S. Marine Corps forces currently located in Okinawa, Japan to Guam, and for military live-fire training.	See response above.

Contact Type	Name	Organization	Comment ID	Theme(s)	Comment	Response
Duplicate	[blank]	Prutehi Litekyan - Save Ritdian	3a	Scoping/ Alternatives	PLSR's members and network comprise of the indigenous CHamoru, the residents of Guam, allies, and concerned citizens with the interest of protecting the beliefs, the culture, the language, the air, the water, and the land of the CHamoru. More specifically, PLSR's members comprise of traditional healers, fishermen, businesspeople, college students, farmers, teachers, social workers, cultural practitioners, and environmentalists. PLSR represents its members, in addition to 25,000 petition signatories, by actively engaging in the legislative, administrative processes and has consistently demonstrated a special interest in the areas of controversy. Since its inception, PLSR has organized more than 500 different actions, including letter-writing campaigns, public testimony, school visits, community rallies, comment drives, protests, tours, press conferences, and more. Accordingly, PLSR and its members have a direct interest in ensuring that federal actions and decisions do not harm or have a potential to harm the environment and the cultural resources and historical properties of the indigenous CHamoru people. These interests extend to environmental resources that could constitute as a historic property, including sources of water and water bodies. DoD's environmental review in connection with actions and decisions that inadequately consider the effect of their undertaking on cultural resources would impair PLSR's interests.	See response above.

Contact Type	Name	Organization	Comment ID	Theme(s)	Comment	Response
Duplicate	[blank]	Prutehi Litekyan - Save Ritdian	3a	Scoping/ Alternatives	Thus, PLSR and its members have a significant interest in ensuring that (1) DoD fulfills its mandates under applicable federal laws and regulations to prevent the destruction or loss of cultural resources and historic properties; and (2) PLSR and its members have public "access to information and appropriate supporting documentation regarding DoD's identification and evaluation efforts and findings, to provide the public opportunities to comment. Critique on the Scoping Process: The information provided to the public on the F-15 Beddown and Infrastructure Upgrades at Andersen Air Force Base made available online is grossly inadequate and provided in a manner that is negligent and harmful. The information provided does not discuss the details of the dismissal of five other potential alternative locations within the Pacific Air Forces area and the reasons why Andersen Air Force Base was selected out of the alternatives. The "strategic pause" in the initial scoping period for the F-15 Beddown and Infrastructure Upgrades at Andersen Air Force Base, Guam occurred at the height of the Covid-19 Pandemic from April to May in 2021. Since then, no public scoping meetings took place and there has been no opportunity for the public to address concerns other than providing written comments online or via postal mail. There was no venue to collect oral testimony and no effort to encourage robust community engagement. The timing of the scoping process is also distressing given that it took place in a limited 30-day period over the holidays.	See response above.

Contact Type	Name	Organization	Comment ID	Theme(s)	Comment	Response
Duplicate	[blank]	Prutehi Litekyan - Save Ritdian	3a	Scoping/ Alternatives	Public engagement is a requirement of the National Environmental Policy Act, and the lack of information and community involvement potentially constitutes violations of human rights and the indigenous rights of the Chamorro people, including but not limited to the right of free, prior, and informed consent, and the rights to life, health, food, culture, and an effective remedy. The public scoping period for this project was just 30 days over a very busy time of year, and government agencies, stakeholders, and the public were not able to identify issues and concerns, and provide new information, data, and suggestions. Lastly, no email address was provided to submit comments, request information, or ask questions in advance of the scoping period deadline. Because of the lack of public outreach, members of the community were unable to request information and again, their ability to submit comments and questions was highly limited to written mail and the online portal. PLSR feels this process must be stopped, re-evaluated, and redirected to ensure the local voices are included to prioritize the protection of vital resources for the future generations of Guam.	See response above.

Contact Type	Name	Organization	Comment ID	Theme(s)	Comment	Response
Duplicate	[blank]	Prutehi Litekyan - Save Ritdian	3b	Biological Resources	Several Possible Impacts on Vital Resources, Community: The construction of the F-15 Beddown and Infrastructure Upgrades at Andersen Air Force Base, Guam as well as its operations could pose serious risks to critical environmental and cultural resources. Approximately 209 total acres would be disturbed for the construction of the F-15 Beddown and Infrastructure Upgrades. In recent years, we have witnessed massive deforestation and the destruction of our rare and endangered native species. The clearing and grading of more land will provoke further destruction of native jungles and the loss of protected species including several invaluable and irreplaceable cultural resources already harmed at several military construction and operation sites including the new U.S. Marine Base, the Live-Fire Training Range Complex, and the Urban Warfare Training Range. These include traditional medicines, slow growing trees, birds, bats, insects, and other living organisms in our vulnerable ecosystem.	The Draft EIS will include requested information and analysis regarding biological resources and will evaluate the potential impacts on vegetation and wildlife from the Proposed Action.

Contact Type	Name	Organization	Comment ID	Theme(s)	Comment	Response
Duplicate	[blank]	Prutehi Litekyan - Save Ritdian	3c	Water Resources	We have witnessed how the massive clearings have made our coastlines, jungles, and fresh water more vulnerable in our recovery from Super Typhoon Mawar. Such clearing has impacted the recharge and natural protections of the Guam Northern Lens Aquifer, Guam's sole-source aquifer that provides the island with up to 90% of its drinking water. Clearing more land to construct the F-15 Beddown and Infrastructure Upgrades at Andersen Air Force Base will make Guam more vulnerable to climate change and impact the security of clean drinking water. PLSR opposes the placement of the F-15 Beddown and Infrastructure Upgrades at Andersen Air Force Base, which is directly located over the islands sole source aquifer. There are tremendous risks for contamination from military jet fuel, the use of AFFF fire-fighting foam, and the distribution of PFAS/PFOS that is associated with such installments. Andersen Air Force Base already has an existing superfund site. The 20,000-acre site was placed on the National Priorities List in October 1992 due to the presence of hazardous substances associated with base operations. Hazardous substances include solvents such as trichloroethane (TCE) and paint thinners; dry cleaning fluids and laundry products; fuels such as JP-4 and gasoline; pesticides; antifreeze; aircraft cleaning compounds; polychlorinated biphenyls (PCBs); metals; and military munitions.	The Draft EIS will include the requested information and analysis regarding water resources and hazardous materials and will evaluate the potential impacts on Northern Guam Lens Aquifer from the Proposed Action.

Contact Type	Name	Organization	Comment ID	Theme(s)	Comment	Response
Duplicate	[blank]	Prutehi Litekyan - Save Ritdian	3c	Water Resources	These substances were found in unlined landfills, drum storage and disposal areas, chemical storage areas, fire training areas, waste storage areas, laundry facilities, and industrial and flight line operations. Andersen Air Force Base is in a karst limestone terrain and the Northern Guam Lens Aquifer (NGLA). The site's long-term cleanup is still ongoing (https://cumulis.epa.gov/supercpad/SiteProfiles/index.cfm?fuseaction=second.Cleanup&id=0902825#bkground).	See response above.
Duplicate	[blank]	Prutehi Litekyan - Save Ritdian	3d	HazMat	PLSR is also specifically concerned about the jet fuel receipt, storage, and distribution over the aquifer and how these chemicals and other hazardous materials will impact the health of the aquifer as well as other invaluable resources and historic properties. The scoping period does not allow for the discussion of the associated environmental and health risks. Guam faced a jet fuel leak in 2017 that resulted in the destruction of 500 tons of soil. Also reflected in this incident, was the alarming level of under-reporting of such incidents to the public. It took several months for the military contractor to inform the Guam EPA of the spill: https://www.kuam.com/story/38846452/2018/08/Thursday/dod-contractor-fined-100k-by-guam-epa https://www.postguam.com/news/local/jet-fuel-spill-wasnt-reported-for-months-defense-contractor-fined/article_74663974-9c7d-11e8-9608-cb40bdef444e.html).	The Draft EIS will include the requested information and analysis regarding hazardous materials and the jet fuel receipt, storage, and distribution system. The EIS will identify the regulations that will be followed and the permit requirements that will be implemented to avoid impacts on the Northern Guam Lens Aquifer and soils.

Contact Type	Name	Organization	Comment ID	Theme(s)	Comment	Response
Duplicate	[blank]	Prutehi Litekyan - Save Ritdian	3e	AQ/ Noise/ Water/ HazMat	Training events associated with this project will also harm the health of our community and our resilience to the climate crisis. The addition of two training exercises per year at 4 weeks each will drastically upsurge air emissions, impacting air quality as well as soil and water quality as contaminants settle and deposit around the island and into the ocean and waterways. The additional training events will also exacerbate noise pollution caused solely by military activities. This equates to 2 months out of the year that the community will be exposed to intensified contamination and disruptive sound. This will harm individuals with noise sensitivities, including our elderly and veterans, as well pets and animals, including essential pollinators: endangered birds and bats. The training events will also consume an absurd amount of fossil fuel, thus increasing the military's overall emissions, and burdening islands already faced with dangerous incidents of climate catastrophe: Each training event would include an additional 12 F-15s for a total of 24 F-15s per training event, 1 tanker/refueling aircraft (e.g., KC-135s, KC46s, A-330s), and 1 early warning aircraft. At cruising altitude, one F-15 will burn around 1,800 gallons of fuel an hour (https://static.e-publishing.af.mil/production/1/af_a3/publication/afpam10-1403/afpam10-1403.pdf). For 24 F-15, that equals 43,200 gallons per hour.	The Draft EIS will include the requested information including air emissions modeling results, noise modeling results, and the potential impacts on air quality, the climate, and noise from the Proposed Action.

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Duplicate	[blank]	Prutehi Litekyan - Save Ritdian	3e	AQ/ Noise/ Water/ HazMat	A tanker uses 1,720 gallons an hour (https://www.defenseone.com/ideas/2023/03/f-35a-engine-would-be-win-win-win-win/384467/). The early warning air craft will use 438 gallons of fuel per hour (https://www.guardianjet.com/jet-aircraft-online-tools/aircraft-brochure.cfm?m=Gulfstream-G550-132). Approximately 272,148 gallons of fuel would be needed for 24 F-15 planes, one tanker, and one early warning aircraft to cruise for just 6 hours in one day. For four days or 24 hours of flight, that equates to 1,088,592 gallons of fuel. In the first 20 years of this century, the military was responsible for 1.2 billion metric tons of greenhouse gas emissions; emitting more toxic gas than a majority of the world's countries. The Air Force and the Navy are two of the largest buyers of fossil fuels, purchasing $4.9 billion and $2.8 billion dollars' worth of fuel in 2017 alone, respectively. (https://watson.brown.edu/costsofwar/files/cow/imce/papers/2019/Summary_Pentagon%20Fuel%20Use%2C%20Climate%20Change%2C%20and%20the%20Costs%20of%20War%20%281%29.pdf https://earth.org/us-military-pollution/#:~:text=It%20established%20that%20if%20the,(GHG)%20in%20the%20world https://www.sciencedaily.com/releases/2019/06/190620100005.htm)	See response above.

Contact Type	Name	Organization	Comment ID	Theme(s)	Comment	Response
Duplicate	[blank]	Prutehi Litekyan - Save Ritdian	3f	Infrastructure/ Transportation/ Socioeconomics/ EJ	There will also be an increase in 240 personnel at the installation. During each four-week training event, which would occur twice per year, an additional approximately 200 personnel would be required for the duration of the event. This is total of 440 additional military personnel on island for 2 months of the year. This will pose issues to public safety, water distribution, sewer and wastewater management, traffic and roadways, food access, housing, and more. Guam is currently facing a housing and labor shortage. The Marines have not yet been transferred from Okinawa, yet we are already witnessing a housing crisis because residents are being outpriced by military households for scarce affordable housing, along with escalations in construction costs for construction and labor.	The Draft EIS will include information and analysis on utility and infrastructure requirements, transportation demand, housing demand, and other socioeconomic and environmental justice topics.
Duplicate	[blank]	Prutehi Litekyan - Save Ritdian	3g	Cultural Resources	In recent years, we have witnessed the continued desecration of ancestral burials, ancestral objects, sacred sites, and the removal of public access, all which impact the survival of Indigenous spiritual and cultural practices and ways of life. The clearing of land for the F-15 Beddown and Infrastructure Upgrades at Andersen Air Force Base will ensure the continued desecration of burials, cultural resources, and sacred areas. Within the last decade, we have witnessed the destruction of over 1,000 acres of limestone forest and critical habitat, the removal of hundreds of significant material remains of our ancestors, and the desecration of at least 26 burials. We are witnessing the erasure of our heritage every day.	The Draft EIS will include information and analysis on cultural resources including measures that would be taken to avoid impact on cultural resources or culturally significant areas. A cultural resources survey will be conducted as part of the EIS process.

Contact Type	Name	Organization	Comment ID	Theme(s)	Comment	Response
Duplicate	[blank]	Prutehi Litekyan - Save Ritdian	3h	HazMat	The clearing of land for the F-15 Beddown and Infrastructure Upgrades at Andersen Air Force Base might also expose and require the treatment of explosive ordinance. The military currently uses open detonation to treat these waste munitions, while further risking contamination to groundwater and air.	The Draft EIS will include information on the presence of unexploded ordnance and other hazards within the project areas and will identify the regulations the DAF follows to avoid impacts from such hazards.
Duplicate	[blank]	Prutehi Litekyan - Save Ritdian	3i	Military Presence	Safety and Security: We are concerned that this project will make Guam and the Mariåna Islands a greater target for war, as the presence of the F-15 jets and related training exercises will position our islands as places of U.S. force projection in the region. War studies have shown that Guam will be devastated should the U.S. enter into conflict with China, and we are now becoming a “first strike community”. A “Divert Airfield " is also being built at the Tinian airport should Guam sustain an attack, further emphasizing and expanding the risk to the islands. (https://www.csis.org/analysis/first-battle-next-war-wargaming-chinese-invasion-taiwan). We oppose the use of this land for the purpose of preparing for war. The project is reported to take place on property already occupied by the Air Force and this land was condemned by eminent domain and the original inhabitants are withheld access. The military occupies almost 30% of the island and expanded activities within these properties further dispossessed Indigenous CHamorus of lands that are already occupied by the U.S. military.	Comment noted. Topics such as global military tensions, war experiences, military spending, military crime rates, federal land holdings, and decolonization are important issues but are outside the scope of NEPA and the EIS. National and local security is an important topic that is considered in all DoD decision making. The public scoping period provided an indirect avenue for concerned citizens to inform decision makers about their views on such issues but discussion on such issues will not be included in the Draft EIS. However, this comment is an important contribution to the NEPA process and will be considered in the decision-making process.

Contact Type	Name	Organization	Comment ID	Theme(s)	Comment	Response
Duplicate	[blank]	Prutehi Litekyan - Save Ritdian	3i	Military Presence	The F-15 Beddown and Infrastructure Upgrades at Andersen Air Force Base reflects the expansion of U.S. military occupation and dominance which threatens our sovereignty, our right to self-determine our political future, and the movement for decolonization for Guåhan. There is an established pattern of military construction and operations that continue to be carried out with a lack of free, prior, and informed consent and in violation of the Indigenous rights of the CHamoru people and other islanders who call Guam home. It is also a known fact throughout the Asia Pacific region, that with amplified U.S. military exercises, also comes a rise in crime and sexual or gendered violence. We are concerned with the risks of increased crime, and sexual and gendered violence that may result from the enlarged military presence of 440 military personnel for 2 months out of the year for the exercises associated with the F-15 Beddown and Infrastructure Upgrades at Andersen Air Force Base. Many reports have shown that despite many efforts, sexual violence continues to rise in the U.S. military: https://theintercept.com/2021/10/03/okinawa-sexual-crimes-us-military/ https://www.militarytimes.com/news/your-military/2023/04/27/sexual-assault-in-the-military-keeps-rising-while-prosecutions-fall/ https://www.npr.org/2023/03/12/1162861309/military-academies-sexual-assault-survey https://www.hillandponton.com/facts-on-military-sexual-trauma-and-statistics/	See response above.

Contact Type	Name	Organization	Comment ID	Theme(s)	Comment	Response
Duplicate	[blank]	Prutehi Litekyan - Save Ritdian	3i	Military Presence	In Closing: One F-15 costs about $24,000 an hour to fly and about $90 million to build. Instead of using this money to build up for war, the U.S. should focus its resources on housing, education, food and water security, and healthcare. (https://www.defenseone.com/business/2023/11/f-15ex-price-tags-rise-boeing-hunts-ways-control-costs/391786/#:~:text=In%20September%2C%20when%20the%20Air,Force%20spokesperson%20Ann%20Stefanek%20confirmed https://www.businessinsider.com/price-military-aircraft-per-flight-hour-2016-8#f-15c-6) War is not inevitable, and we oppose setting up our islands to once again be the stomping grounds for a conflict between imperial powers. We do not consent to the continued destruction, contamination, and desecration of our island for “national security.” We do not consent to being collateral damage. We must demand genuine security, without the threat of contamination to our soil, air, and water, without the desecration of sacred sites and remains, without the erasure of our heritage, without the loss of important food resources and other threats to food security, with housing, and in peace without the threat of war. We demand that local, national, and international leadership on all sides prioritize peace, diplomacy, decontamination, and disarmament to prevent another war.	See response above.

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Duplicate	[blank]	Prutehi Litekyan - Save Ritdian	3j	Cumulative	We still have not experienced all the impacts associated with the ongoing military expansion. We are already witnessing a housing crisis, a rise in crime, the loss of access to sacred areas, jungles to harvest medicines, critical fishing areas, and loss of access to family properties that were seized after World War II. For these reasons and more, PLSR passionately opposes the F-15 Beddown and Infrastructure Upgrades at Andersen Air Force Base in Guam. Thank you and Si Yu'os Ma'åse'. Sincerely, on behalf Prutehi Litekyan: Save Ritidian: Monaeka Flores, Core Member Jessica Nangauta, Board Chair	The Draft EIS will include an analysis of the cumulative impacts from the Proposed Action and present and reasonably foreseeable actions in the area. This includes the ongoing military relocation.
Public	Aaron	N/A	4	Scoping/ Alternatives	Duplicate of form letter. Identical to Comment 5a.	See response to Comment 5a.

Contact Type	Name	Organization	Comment ID	Theme(s)	Comment	Response
Public	Anna Vasquez	N/A	5a	Scoping/ Alternatives	Hafa Adai: I submit the following comment in opposition of the proposed F-15 Beddown and Infrastructure Upgrades at Andersen Air Force Base, Guam for the many adverse impacts it will have to the community and environment of Guam and the Mariåna Islands. The risks associated must be weighed against a long history of environmental justice issues and countless violations of our human and Indigenous rights. This includes but is not limited to the loss of access, the destruction of native species, numerous cases of substantial contamination, and severe desecration of sacred sites and ancestral remains, all still occurring at several military construction and operation sites around the island. The scoping period is insufficient. The information provided to the public on the F-15 Beddown and Infrastructure Upgrades at Andersen Air Force Base made available online is grossly inadequate and provided in a manner that is negligent and harmful. The information provided does not discuss the details of the dismissal of five other potential alternative locations within the Pacific Air Forces area and the reasons why Andersen Air Force Base was selected out of the alternatives. The “strategic pause” in the initial scoping period for the F-15 Beddown and Infrastructure Upgrades at Andersen Air Force Base, Guam occurred at the height of the Covid-19 Pandemic from April to May in 2021.	The Draft EIS will identify all selection criteria and alternatives considered, and the rationale for determining that the Proposed Action is the only reasonable alternative. No scoping meetings were conducted while the EIS process was paused. When the EIS process was resumed, the DAF conducted an additional virtual public scoping period from December 2023 to January 2024. Additional public engagement and outreach opportunities will be considered when the Draft EIS becomes available for public review.

Contact Type	Name	Organization	Comment ID	Theme(s)	Comment	Response
Duplicate	Anna Vasquez	N/A	5a	Scoping/ Alternatives	Since then, no public scoping meetings took place and there has been no opportunity for the public to address concerns other than providing written comments online or via postal mail. There was no venue to collect oral testimony and no effort to encourage robust community engagement. The timing of the scoping process is also distressing given that it took place in a limited 30-day period over the holidays. No email address was provided to submit comments, request information, or ask questions in advance of the scoping period deadline. Because of the lack of public outreach, members of the community were unable to request information and again, their ability to submit comments and questions was highly limited to written mail and the online portal. This process must be stopped, re-evaluated and redirected to ensure the local voices are included to prioritize the protection of vital resources for the future generations of Guam.	See response above.

Contact Type	Name	Organization	Comment ID	Theme(s)	Comment	Response
Duplicate	Anna Vasquez	N/A	5b	Biological Resources	The construction of the F-15 Beddown and Infrastructure Upgrades at Andersen Air Force Base, Guam as well as its operations could pose serious risks to critical environmental and cultural resources. Approximately 209 total acres would be disturbed for the construction of the F-15 Beddown and Infrastructure Upgrades. In recent years, we have witnessed massive deforestation and the destruction of our rare and endangered native species. The clearing and grading of more land will provoke further destruction of native jungles and the loss of protected species including several invaluable and irreplaceable cultural resources already harmed at several military construction and operation sites including the new U.S. Marine Base, the Live-Fire Training Range Complex, and the Urban Warfare Training Range. These include traditional medicines, slow growing trees, birds, bats, insects, and other living organisms in our vulnerable ecosystem.	The Draft EIS will include requested information and analysis regarding biological resources and will evaluate the potential impacts on vegetation and wildlife from the Proposed Action.

Contact Type	Name	Organization	Comment ID	Theme(s)	Comment	Response
Duplicate	Anna Vasquez	N/A	5c	Water Resources	We have witnessed how the massive clearings have made our coastlines, jungles, and fresh water more vulnerable in our recovery from Super Typhoon Mawar. Such clearing has impacted the recharge and natural protections of the Guam Northern Lens Aquifer, Guam's sole-source aquifer that provides the island with up to 90% of its drinking water. Clearing more land to construct the F-15 Beddown and Infrastructure Upgrades at Andersen Air Force Base will make Guam more vulnerable to climate change and impact the security of clean drinking water. I oppose the placement of the F-15 Beddown and Infrastructure Upgrades at Andersen Air Force Base, which is directly located over the islands sole source aquifer. There are tremendous risks for contamination from military jet fuel, the use of AFFF fire-fighting foam, and the distribution of PFAS/PFOS that is associated with such installments. Andersen Air Force Base already has an existing superfund site.	The Draft EIS will include the requested information and analysis regarding water resources and will evaluate the potential impacts on Northern Guam Lens Aquifer from the Proposed Action.

Contact Type	Name	Organization	Comment ID	Theme(s)	Comment	Response
Duplicate	Anna Vasquez	N/A	5d	HazMat	I am specifically concerned about the jet fuel receipt, storage, and distribution over the aquifer and how these chemicals and other hazardous materials will impact the health of the aquifer as well as other invaluable resources and historic properties. The scoping period does not allow for the discussion of the associated environmental and health risks. Guam recently experienced a jet fuel leak that resulted in the destruction of 500 tons of soil. Also reflected in this incident, was the alarming level of under-reporting of such incidents to the public. It took several months for the military contractor to inform the Guam EPA of the spill.	The Draft EIS will include the requested information and analysis regarding hazardous materials and the jet fuel receipt, storage, and distribution system. The EIS will identify the regulations that will be followed and the permit requirements that will be implemented to avoid impacts on the Northern Guam Lens Aquifer and soils.

Contact Type	Name	Organization	Comment ID	Theme(s)	Comment	Response
Duplicate	Anna Vasquez	N/A	5e	AQ/ Noise/ Water/ HazMat	Training events associated with this project will also harm the health of our community and our resilience to the climate crisis. The addition of two training exercises per year at 4 weeks each will drastically increase air emissions, impacting air quality as well as soil and water quality as contaminants settle and deposit around the island and into the ocean and waterways. The additional training events will also exacerbate noise pollution caused solely by military activities. This equates to 2 months out of the year that the community will be exposed to intensified contamination and disruptive sound. This will harm individuals with noise sensitivities, including our elderly and veterans, as well pets and animals, including essential pollinators: endangered birds and bats. The training events will also consume a disturbing amount of fossil fuel, thus increasing the military's overall emissions, burdening islands already faced with dangerous incidents of climate catastrophe. A total of 272,148 gallons of fuel would be needed for 24 F-15 planes, one tanker, and one early warning aircraft to cruise for just 6 hours in one day. For four days or 24 hours of flight, that equates to 1,088,592 gallons of fuel.	The Draft EIS will include the requested information including air emissions modeling results, noise modeling results, and the potential impacts on air quality, the climate, and noise from the Proposed Action.

Contact Type	Name	Organization	Comment ID	Theme(s)	Comment	Response
Duplicate	Anna Vasquez	N/A	5f	Infrastructure/ Transportation/ Socioeconomics/ EJ	There will also be an in 240 personnel at the installation. During each four-week training event, which would occur twice per year, an additional approximately 200 personnel would be required for the duration of the event. This is total of 440 additional military personnel on island for 2 months of the year. This will pose issues to public safety, water production, sewer and wastewater management, traffic and roadways, food access, housing, and more. Guam is currently facing a housing and labor shortage. The marines have not yet been transferred from Okinawa, yet we are already witnessing a housing crisis because residents are being outpriced by military households for scarce affordable housing, along with increases in construction costs for construction and labor.	The Draft EIS will include information and analysis on utility and infrastructure requirements, transportation demand, housing demand, and other socioeconomic and environmental justice topics.
Duplicate	Anna Vasquez	N/A	5g	Cultural Resources	In recent years, we have witnessed the continued desecration of ancestral burials, ancestral objects, sacred sites, and the removal of public access, all which impact the survival of Indigenous spiritual and cultural practices and ways of life. The taking and clearing of land for the F-15 Beddown and Infrastructure Upgrades at Andersen Air Force Base will ensure the continued desecration of burials, cultural resources, and sacred areas. Within the last decade, we have witnessed the destruction of over 1,000 acres of limestone forest and critical habitat, the removal of hundreds of significant material remains of our ancestors, and the desecration of at least 26 burials. We are witnessing the erasure of our heritage every day.	The Draft EIS will include information and analysis on cultural resources including measures that would be taken to avoid impact on cultural resources or culturally significant areas. A cultural resources survey will be conducted as part of the EIS process.

Contact Type	Name	Organization	Comment ID	Theme(s)	Comment	Response
Duplicate	Anna Vasquez	N/A	5h	HazMat	The clearing of land for the F-15 Beddown and Infrastructure Upgrades at Andersen Air Force Base might expose and require the treatment of explosive ordinance. The military currently uses open detonation to treat these waste munitions, while further risking contamination to groundwater and air.	The Draft EIS will include information on the presence of unexploded ordnance and other hazards within the project areas and will identify the regulations the DAF follows to avoid impacts from such hazards.
Duplicate	Anna Vasquez	N/A	5i	Military Presence	I am concerned that this project will make Guam and the Mariåna Islands a greater target for war, as the presence of the F-15 jets and related training exercises will position our islands as places of U.S. force projection in the region. War studies have shown that Guam will be devastated should the U.S. enter into conflict with China and we are now becoming a “first strike community”. A “Divert Airfield " is also being built at the Tinian airport should Guam sustain an attack, further emphasizing and expanding the risk to the islands. (https://www.csis.org/analysis/first-battle-next-war-wargaming-chinese-invasion-taiwan). I oppose the use of this land for the purpose of preparing for war. The project is reported to take place on property already occupied by the Air Force and this land was condemned by eminent domain and the original inhabitants are withheld access.	Comment noted. Topics such as global military tensions, war experiences, federal land holdings, and decolonization are important issues but are outside the scope of NEPA and the EIS. National and local security is an important topic that is considered in all DoD decision making. The public scoping period provided an indirect avenue for concerned citizens to inform decision makers about their views on such issues but discussion on such issues will not be included in the Draft EIS. However, this comment is an important contribution to the NEPA process and will be considered in the decision-making process.

Contact Type	Name	Organization	Comment ID	Theme(s)	Comment	Response
Duplicate	Anna Vasquez	N/A	5i	Military Presence	The military occupies almost 30% of the island and expanded activities within these properties further dispossessed Indigenous CHamorus of lands that are already occupied by the U.S. military. I oppose the use of this land for the purpose of preparing for war. The project is reported to take place on property already occupied by the Air Force and this land was condemned by eminent domain and the original inhabitants are withheld access. The military occupies almost 30% of the island and expanded activities within these properties further dispossessed Indigenous CHamorus of lands that are already occupied by the U.S. military. The F-15 Beddown and Infrastructure Upgrades at Andersen Air Force Base reflects the expansion of U.S. military occupation and dominance which threatens our sovereignty, our right to self-determine our political future, and the movement for decolonization for Guåhan.	See response above.
Duplicate	Anna Vasquez	N/A	5j	Cumulative	We still have not experienced all the impacts associated with the ongoing military expansion. We are already witnessing a housing crisis, a rise in crime, the loss of access to sacred areas, jungles to harvest medicines, critical fishing areas, and loss of access to family properties that were seized after World War II.	The Draft EIS will include an analysis of the cumulative impacts from the Proposed Action and present and reasonably foreseeable actions in the area. This includes the ongoing military relocation.

Contact Type	Name	Organization	Comment ID	Theme(s)	Comment	Response
Public	Cassie Bordallo	N/A	6a	Air Quality/ Noise	The proposed F-15 Beddown and Infrastructure Upgrades at Andersen Air Force Base, Guam could have many adverse impacts to the community and environment of Guam and the Mariåna Islands. The risks associated must be weighed against a long history of environmental justice issues and countless violations of our human and Indigenous rights. Approximately 209 acres would be disturbed for the construction of the F-15 Beddown and Infrastructure Upgrades to house and run 12 Singapore F-15 fighter jets in Guam. This will also result in the additional presence of 240 service members on island, with another 200 members on island during F-15 exercises. The F-15 exercises are to take place twice a year for 4-week periods, equating to 2 months of increased military exercises. The F-15 training exercises will consume millions of gallons of fossil fuel, exacerbating risks in the climate crisis, and intensifying harmful emissions and noise pollution.	The Draft EIS will include the requested information including air emissions modeling results, noise modeling results, and the potential impacts on air quality, the climate, and noise from the Proposed Action.

Contact Type	Name	Organization	Comment ID	Theme(s)	Comment	Response
Duplicate	Cassie Bordallo	N/A	6b	Scoping	The scoping period is insufficient. The information provided to the public on the F-15 Beddown and Infrastructure Upgrades at Andersen Air Force Base made available online is grossly inadequate and provided in a manner that is negligent and harmful. No email address was provided to submit comments, request information, or ask questions in advance of the scoping period deadline. Because of the lack of public outreach, members of the community were unable to request information and again, their ability to submit comments and questions was highly limited to written mail and the online portal. This process must be stopped, re-evaluated and redirected to ensure that local voices are included to prioritize the protection of vital resources for the future generations of Guam.	No scoping meetings were conducted while the EIS process was paused. When the EIS process was resumed, the DAF conducted an additional virtual public scoping period from December 2023 to January 2024. Additional public engagement and outreach opportunities will be considered when the Draft EIS becomes available for public review
Duplicate	Cassie Bordallo	N/A	6c	Water Resources	Concerns about jet fuel storage over the Northern Lens Aquifer must be taken seriously.	The Draft EIS will include the requested information and analysis regarding hazardous materials and the jet fuel receipt, storage, and distribution system, and will identify the regulations that will be followed and the permit requirements that will be implemented to avoid impacts on the Northern Guam Lens Aquifer and soils.
Public	Chauntae Quichocho	N/A	7a	Scoping/ Alternatives	Duplicate of form letter. Identical to Comment 5a.	See response to Comment 5a.
Duplicate	Chauntae Quichocho	N/A	7b	Biological Resources	Duplicate of form letter. Identical to Comment 5b.	See response to Comment 5b.
Duplicate	Chauntae Quichocho	N/A	7c	Water Resources	Duplicate of form letter. Identical to Comment 5c.	See response to Comment 5c.
Duplicate	Chauntae Quichocho	N/A	7d	HazMat	Duplicate of form letter. Identical to Comment 5d.	See response to Comment 5d.

Contact Type	Name	Organization	Comment ID	Theme(s)	Comment	Response
Duplicate	Chauntae Quichocho	N/A	7e	AQ/ Noise/ Water/ HazMat	Duplicate of form letter. Identical to Comment 5e.	See response to Comment 5e.
Duplicate	Chauntae Quichocho	N/A	7f	Infrastructure/ Transportation/ Socioeconomics/ EJ	Duplicate of form letter. Identical to Comment 5f.	See response to Comment 5f.
Duplicate	Chauntae Quichocho	N/A	7g	Cultural Resources	Duplicate of form letter. Identical to Comment 5g.	See response to Comment 5g.
Duplicate	Chauntae Quichocho	N/A	7h	HazMat	Duplicate of form letter. Identical to Comment 5h.	See response to Comment 5h.
Duplicate	Chauntae Quichocho	N/A	7i	Military Presence	Duplicate of form letter. Identical to Comment 5i.	See response to Comment 5i.
Duplicate	Chauntae Quichocho	N/A	7j	Cumulative	Duplicate of form letter. Identical to Comment 5j.	See response to Comment 5j.
Public	Kaitlin McManus	N/A	8a	Scoping/ Alternatives	Duplicate of form letter. Identical to Comment 5a.	See response to Comment 5a.
Duplicate	Kaitlin McManus	N/A	8b	Biological Resources	Duplicate of form letter. Identical to Comment 5b.	See response to Comment 5b.
Duplicate	Kaitlin McManus	N/A	8c	Water Resources	Duplicate of form letter. Identical to Comment 5c.	See response to Comment 5c.
Duplicate	Kaitlin McManus	N/A	8d	HazMat	Duplicate of form letter. Identical to Comment 5d.	See response to Comment 5d.
Duplicate	Kaitlin McManus	N/A	8e	AQ/ Noise/ Water/ HazMat	Duplicate of form letter. Identical to Comment 5e.	See response to Comment 5e.
Duplicate	Kaitlin McManus	N/A	8f	Infrastructure/ Transportation/ Socioeconomics/ EJ	Duplicate of form letter. Identical to Comment 5f.	See response to Comment 5f.
Duplicate	Kaitlin McManus	N/A	8g	Cultural Resources	Duplicate of form letter. Identical to Comment 5g.	See response to Comment 5g.
Duplicate	Kaitlin McManus	N/A	8h	HazMat	Duplicate of form letter. Identical to Comment 5h.	See response to Comment 5h.
Duplicate	Kaitlin McManus	N/A	8i	Military Presence	Duplicate of form letter. Identical to Comment 5i.	See response to Comment 5i.

Contact Type	Name	Organization	Comment ID	Theme(s)	Comment	Response
Duplicate	Kaitlin McManus	N/A	8j	Cumulative	Duplicate of form letter. Identical to Comment 5j.	See response to Comment 5j.
Public	Charissa Manibusan	N/A	9a	Scoping/ Alternatives	Duplicate of form letter. Identical to Comment 5a.	See response to Comment 5a.
Duplicate	Charissa Manibusan	N/A	9b	Biological Resources	Duplicate of form letter. Identical to Comment 5b.	See response to Comment 5b.
Duplicate	Charissa Manibusan	N/A	9c	Water Resources	Duplicate of form letter. Identical to Comment 5c.	See response to Comment 5c.
Duplicate	Charissa Manibusan	N/A	9d	HazMat	Duplicate of form letter. Identical to Comment 5d.	See response to Comment 5d.
Duplicate	Charissa Manibusan	N/A	9e	AQ/ Noise/ Water/ HazMat	Duplicate of form letter. Identical to Comment 5e.	See response to Comment 5e.
Duplicate	Charissa Manibusan	N/A	9f	Infrastructure/ Transportation/ Socioeconomics/ EJ	Duplicate of form letter. Identical to Comment 5f.	See response to Comment 5f.
Duplicate	Charissa Manibusan	N/A	9g	Cultural Resources	Duplicate of form letter. Identical to Comment 5g.	See response to Comment 5g.
Duplicate	Charissa Manibusan	N/A	9h	HazMat	Duplicate of form letter. Identical to Comment 5h.	See response to Comment 5h.
Duplicate	Charissa Manibusan	N/A	9i	Military Presence	Duplicate of form letter. Identical to Comment 5i.	See response to Comment 5i.
Duplicate	Charissa Manibusan	N/A	9j	Cumulative	Duplicate of form letter. Identical to Comment 5j.	See response to Comment 5j.
Public	Charles Tanner	N/A	10	Not Substantive	I fully support this project and look forward to welcoming them.	Comment noted.
Public	Teresa Laguaña	N/A	11/12a	Scoping/ Alternatives	Duplicate of form letter. See Comment 5a.	See response to Comment 5a.
			11/12b	Biological Resources	Duplicate of form letter. See Comment 5b.	See response to Comment 5b.
Public	Ji Hye Choi	N/A	13a	Scoping/ Alternatives	Duplicate of form letter. Identical to Comment 5a.	See response to Comment 5a.
Duplicate	Ji Hye Choi	N/A	13b	Biological Resources	Duplicate of form letter. Identical to Comment 5b.	See response to Comment 5b.

Contact Type	Name	Organization	Comment ID	Theme(s)	Comment	Response
Duplicate	Ji Hye Choi	N/A	13c	Water Resources	Duplicate of form letter. Identical to Comment 5c.	See response to Comment 5c.
Duplicate	Ji Hye Choi	N/A	13d	HazMat	Duplicate of form letter. Identical to Comment 5d.	See response to Comment 5d.
Duplicate	Ji Hye Choi	N/A	13e	AQ/ Noise/ Water/ HazMat	Duplicate of form letter. Identical to Comment 5e.	See response to Comment 5e.
Duplicate	Ji Hye Choi	N/A	13f	Infrastructure/ Transportation/ Socioeconomics/ EJ	Duplicate of form letter. Identical to Comment 5f.	See response to Comment 5f.
Duplicate	Ji Hye Choi	N/A	13g	Cultural Resources	Duplicate of form letter. Identical to Comment 5g.	See response to Comment 5g.
Duplicate	Ji Hye Choi	N/A	13h	HazMat	Duplicate of form letter. Identical to Comment 5h.	See response to Comment 5h.
Duplicate	Ji Hye Choi	N/A	13i	Military Presence	Duplicate of form letter. Identical to Comment 5i.	See response to Comment 5i.
Duplicate	Ji Hye Choi	N/A	13j	Cumulative	Duplicate of form letter. Identical to Comment 5j.	See response to Comment 5j.
NGO	[blank]	Our Common Wealth 670	14a	Scoping/ Alternatives	Duplicate of form letter. Identical to Comment 5a.	See response to Comment 5a.
Duplicate	[blank]	Our Common Wealth 670	14b	Biological Resources	Duplicate of form letter. Identical to Comment 5b.	See response to Comment 5b.
Duplicate	[blank]	Our Common Wealth 670	14c	Water Resources	Duplicate of form letter. Identical to Comment 5c.	See response to Comment 5c.
Duplicate	[blank]	Our Common Wealth 670	14d	HazMat	Duplicate of form letter. Identical to Comment 5d.	See response to Comment 5d.
Duplicate	[blank]	Our Common Wealth 670	14e	AQ/ Noise/ Water/ HazMat	Duplicate of form letter. Identical to Comment 5e.	See response to Comment 5e.
Duplicate	[blank]	Our Common Wealth 670	14f	Infrastructure/ Transportation/ Socioeconomics/ EJ	Duplicate of form letter. Identical to Comment 5f.	See response to Comment 5f.
Duplicate	[blank]	Our Common Wealth 670	14g	Cultural Resources	Duplicate of form letter. Identical to Comment 5g.	See response to Comment 5g.

Contact Type	Name	Organization	Comment ID	Theme(s)	Comment	Response
Duplicate	[blank]	Our Common Wealth 670	14h	HazMat	Duplicate of form letter. Identical to Comment 5h.	See response to Comment 5h.
Duplicate	[blank]	Our Common Wealth 670	14i	Military Presence	Duplicate of form letter. Identical to Comment 5i.	See response to Comment 5i.
Duplicate	[blank]	Our Common Wealth 670	14j	Cumulative	How does this proposal impact the plans on Tinian and what are the cumulative impacts?	The Proposed Action will not affect any ongoing or future projects on Tinian. Aircraft training activities under the Proposed Action that may occur over Tinian would be in alignment with the training activities that already occur and that were analyzed in the Mariana Islands Testing and Training (MITT) Activities Final Environmental Impact Statement/Overseas Environmental Impact Statement, 2015.
Duplicate	[blank]	Our Common Wealth 670	14k	Military Presence	Duplicate of form letter. Identical to Comment 5i.	See response to Comment 5i.
Duplicate	[blank]	Our Common Wealth 670	14l	Cumulative	Duplicate of form letter. Identical to Comment 5j.	See response to Comment 5j.
Public	Czeska	N/A	15a	Scoping/ Alternatives	Duplicate of form letter. Identical to Comment 5a.	See response to Comment 5a.
Duplicate	Czeska	N/A	15b	Biological Resources	Duplicate of form letter. Identical to Comment 5b.	See response to Comment 5b.
Duplicate	Czeska	N/A	15c	Water Resources	Duplicate of form letter. Identical to Comment 5c.	See response to Comment 5c.
Duplicate	Czeska	N/A	15d	HazMat	Duplicate of form letter. Identical to Comment 5d.	See response to Comment 5d.
Duplicate	Czeska	N/A	15e	AQ/ Noise/ Water/ HazMat	Duplicate of form letter. Identical to Comment 5e.	See response to Comment 5e.
Duplicate	Czeska	N/A	15f	Infrastructure/ Transportation/ Socioeconomics/ EJ	Duplicate of form letter. Identical to Comment 5f.	See response to Comment 5f.
Duplicate	Czeska	N/A	15g	Cultural Resources	Duplicate of form letter. Identical to Comment 5g.	See response to Comment 5g.

Contact Type	Name	Organization	Comment ID	Theme(s)	Comment	Response
Duplicate	Czeska	N/A	15h	HazMat	Duplicate of form letter. Identical to Comment 5h.	See response to Comment 5h.
Duplicate	Czeska	N/A	15i	Military Presence	Duplicate of form letter. Identical to Comment 5i.	See response to Comment 5i.
Duplicate	Czeska	N/A	15j	Cumulative	Duplicate of form letter. Identical to Comment 5j.	See response to Comment 5j.
Public	Thomas Perez	N/A	16	HazMat	Creating an infrastructure for 12 jet planes and storing jet fuel over the Northern Lens Aquifer raises concerns over water safety and contamination. The scoping period is insufficient, the information provided to the public is grossly inadequate, and this project must be stopped for consideration of community health and protection of natural resources that the U.S. military has historically neglected and ended up endangering local communities. Remember Red Hill on O'ahu?	The Draft EIS will include information and analysis regarding hazardous materials and the jet fuel receipt, storage, and distribution system, and will identify the regulations that will be followed and the permit requirements that will be implemented to avoid impacts on the Northern Guam Lens Aquifer and soils .
Public	Lu Blas	N/A	17/18	EJ	Opposed to F-15 Beddown and Infrastructure Upgrades at Andersen Air Force base. They will bring about countless environmental issues which have historical precedent, as well as violations to indigenous CHamoru and other residents health.	The Draft EIS will include information and analysis regarding biological resources, water resources, cultural resources, environmental justice, and other environmental resources areas.
Public	Hokule'a Santos	N/A	19a	Scoping/ Alternatives	Duplicate of form letter. Identical to Comment 5a.	See response to Comment 5a.
Duplicate	Hokule'a Santos	N/A	19b	Biological Resources	Duplicate of form letter. Identical to Comment 5b.	See response to Comment 5b.
Duplicate	Hokule'a Santos	N/A	19c	Water Resources	Duplicate of form letter. Identical to Comment 5c.	See response to Comment 5c.
Duplicate	Hokule'a Santos	N/A	19d	HazMat	Duplicate of form letter. Identical to Comment 5d.	See response to Comment 5d.
Duplicate	Hokule'a Santos	N/A	19e	AQ/ Noise/ Water/ HazMat	Duplicate of form letter. Identical to Comment 5e.	See response to Comment 5e.

Contact Type	Name	Organization	Comment ID	Theme(s)	Comment	Response
Duplicate	Hokule'a Santos	N/A	19f	Infrastructure/ Transportation/ Socioeconomics/ EJ	Duplicate of form letter. Identical to Comment 5f.	See response to Comment 5f.
Duplicate	Hokule'a Santos	N/A	19g	Cultural Resources	Duplicate of form letter. Identical to Comment 5g.	See response to Comment 5g.
Duplicate	Hokule'a Santos	N/A	19h	HazMat	Duplicate of form letter. Identical to Comment 5h.	See response to Comment 5h.
Duplicate	Hokule'a Santos	N/A	19i	Military Presence	Duplicate of form letter. Identical to Comment 5i.	See response to Comment 5i.
Duplicate	Hokule'a Santos	N/A	19j	Cumulative	Duplicate of form letter. Identical to Comment 5j.	See response to Comment 5j.
Public	Victor Sahagon	N/A	20	Military Presence	I strongly oppose this Idea of having Singapore Jets to be stationed here on our small Island, we don't want Guam to be a target of any communist country. Our Island has been threatened by North Korea, China, and we just don't want any part of this problem!!	Comment noted. Topics such as global military tensions are important issues but are outside the scope of NEPA and the EIS. National and local security is an important topic that is considered in all DoD decision making. The public scoping period provided an indirect avenue for concerned citizens to inform decision makers about their views on such issues but discussion on such issues will not be included in the Draft EIS. However, this comment is an important contribution to the NEPA process and will be considered in the decision-making process.
Public	Analee Villagomez	N/A	21/22	Military Presence	Duplicate of form letter. Identical to Comment 5i.	See response to Comment 5i.
Public	Monaeka Flores	N/A	23/24a	Scoping/ Alternatives	Duplicate of form letter. Identical to Comment 5a.	See response to Comment 5a.
Duplicate	Monaeka Flores	N/A	23/24b	Biological Resources	Duplicate of form letter. Identical to Comment 5b.	See response to Comment 5b.
Duplicate	Monaeka Flores	N/A	23/24c	Water Resources	Duplicate of form letter. Identical to Comment 5c.	See response to Comment 5c.

Contact Type	Name	Organization	Comment ID	Theme(s)	Comment	Response
Duplicate	Monaeka Flores	N/A	23/24d	HazMat	Duplicate of form letter. Identical to Comment 5d.	See response to Comment 5d.
Duplicate	Monaeka Flores	N/A	23/24e	AQ/ Noise/ Water/ HazMat	Duplicate of form letter. Identical to Comment 5e.	See response to Comment 5e.
Duplicate	Monaeka Flores	N/A	23/24f	Infrastructure/ Transportation/ Socioeconomics/ EJ	Duplicate of form letter. Identical to Comment 5f.	See response to Comment 5f.
Duplicate	Monaeka Flores	N/A	23/24g	Cultural Resources	Duplicate of form letter. Identical to Comment 5g.	See response to Comment 5g.
Duplicate	Monaeka Flores	N/A	23/24h	HazMat	Duplicate of form letter. Identical to Comment 5h.	See response to Comment 5h.
Duplicate	Monaeka Flores	N/A	23/24i	Military Presence	Duplicate of form letter. Identical to Comment 5i.	See response to Comment 5i.
Duplicate	Monaeka Flores	N/A	23/24j	Cumulative	Duplicate of form letter. Identical to Comment 5j.	See response to Comment 5j.
Public	tammy c meigs	N/A	25	Noise	You're going to need a noise mitigation program.	The Draft EIS will include noise information including, noise modeling results, and analysis for the potential impacts on noise from the Proposed Action.
Public	Ethan Järvi	N/A	26a	Scoping/ Alternatives	Duplicate of form letter. Identical to Comment 5a.	See response to Comment 5a.
Duplicate	Ethan Järvi	N/A	26b	Biological Resources	Duplicate of form letter. Identical to Comment 5b.	See response to Comment 5b.
Duplicate	Ethan Järvi	N/A	26c	Water Resources	Duplicate of form letter. Identical to Comment 5c.	See response to Comment 5c.
Duplicate	Ethan Järvi	N/A	26d	HazMat	Duplicate of form letter. Identical to Comment 5d.	See response to Comment 5d.
Duplicate	Ethan Järvi	N/A	26e	AQ/ Noise/ Water/ HazMat	Duplicate of form letter. Identical to Comment 5e.	See response to Comment 5e.
Duplicate	Ethan Järvi	N/A	26f	Infrastructure/ Transportation/ Socioeconomics/ EJ	Duplicate of form letter. Identical to Comment 5f.	See response to Comment 5f.

Contact Type	Name	Organization	Comment ID	Theme(s)	Comment	Response
Duplicate	Ethan Järvi	N/A	26g	Cultural Resources	Duplicate of form letter. Identical to Comment 5g.	See response to Comment 5g.
Duplicate	Ethan Järvi	N/A	26h	HazMat	Duplicate of form letter. Identical to Comment 5h.	See response to Comment 5h.
Duplicate	Ethan Järvi	N/A	26i	Military Presence	Duplicate of form letter. Identical to Comment 5i.	See response to Comment 5i.
Duplicate	Ethan Järvi	N/A	26j	Cumulative	Duplicate of form letter. Identical to Comment 5j.	See response to Comment 5j.
Public	Victoria-Lola Leon Guerrero	N/A	27a	Scoping/ Alternatives	Duplicate of form letter. Identical to Comment 5a.	See response to Comment 5a.
Duplicate	Victoria-Lola Leon Guerrero	N/A	27b	Biological Resources	Duplicate of form letter. Identical to Comment 5b.	See response to Comment 5b.
Duplicate	Victoria-Lola Leon Guerrero	N/A	27c	Water Resources	Duplicate of form letter. Identical to Comment 5c.	See response to Comment 5c.
Duplicate	Victoria-Lola Leon Guerrero	N/A	27d	AQ/ Noise/ Water/ HazMat	Duplicate of form letter. Identical to Comment 5e.	See response to Comment 5e.
Duplicate	Victoria-Lola Leon Guerrero	N/A	27e	Infrastructure/ Transportation/ Socioeconomics/ EJ	Duplicate of form letter. Identical to Comment 5f.	See response to Comment 5f.
Duplicate	Victoria-Lola Leon Guerrero	N/A	27f	Cultural Resources	Duplicate of form letter. Identical to Comment 5g.	See response to Comment 5g.
Duplicate	Victoria-Lola Leon Guerrero	N/A	27g	HazMat	Duplicate of form letter. Identical to Comment 5h.	See response to Comment 5h.
Duplicate	Victoria-Lola Leon Guerrero	N/A	27h	Military Presence	Duplicate of form letter. Identical to Comment 5i.	See response to Comment 5i.
Public	April Silvestre	N/A	28a	Scoping/ Alternatives	Duplicate of form letter. Identical to Comment 5a.	See response to Comment 5a.

Contact Type	Name	Organization	Comment ID	Theme(s)	Comment	Response
Duplicate	April Silvestre	N/A	28b	Biological Resources	Duplicate of form letter. Identical to Comment 5b.	See response to Comment 5b.
Duplicate	April Silvestre	N/A	28c	Water Resources	Duplicate of form letter. Identical to Comment 5c.	See response to Comment 5c.
Duplicate	April Silvestre	N/A	28d	HazMat	Duplicate of form letter. Identical to Comment 5d.	See response to Comment 5d.
Duplicate	April Silvestre	N/A	28e	AQ/ Noise/ Water/ HazMat	Duplicate of form letter. Identical to Comment 5e.	See response to Comment 5e.
Duplicate	April Silvestre	N/A	28f	Infrastructure/ Transportation/ Socioeconomics/ EJ	Duplicate of form letter. Identical to Comment 5f.	See response to Comment 5f.
Duplicate	April Silvestre	N/A	28g	Cultural Resources	Duplicate of form letter. Identical to Comment 5g.	See response to Comment 5g.
Duplicate	April Silvestre	N/A	28h	HazMat	Duplicate of form letter. Identical to Comment 5h.	See response to Comment 5h.
Duplicate	April Silvestre	N/A	28i	Military Presence	Duplicate of form letter. Identical to Comment 5i.	See response to Comment 5i.
Duplicate	April Silvestre	N/A	28j	Cumulative	Duplicate of form letter. Identical to Comment 5j.	See response to Comment 5j.
Public	Maria Hernandez	N/A	29a	Scoping/ Alternatives	Duplicate of form letter. Identical to Comment 5a.	See response to Comment 5a.
Duplicate	Maria Hernandez	N/A	29b	Biological Resources	Duplicate of form letter. Identical to Comment 5b.	See response to Comment 5b.
Duplicate	Maria Hernandez	N/A	29c	Water Resources	Duplicate of form letter. Identical to Comment 5c.	See response to Comment 5c.
Duplicate	Maria Hernandez	N/A	29d	HazMat	Duplicate of form letter. Identical to Comment 5d.	See response to Comment 5d.
Duplicate	Maria Hernandez	N/A	29e	AQ/ Noise/ Water/ HazMat	Duplicate of form letter. Identical to Comment 5e.	See response to Comment 5e.
Duplicate	Maria Hernandez	N/A	29f	Infrastructure/ Transportation/ Socioeconomics/ EJ	Duplicate of form letter. Identical to Comment 5f.	See response to Comment 5f.

Contact Type	Name	Organization	Comment ID	Theme(s)	Comment	Response
Duplicate	Maria Hernandez	N/A	29g	Cultural Resources	Duplicate of form letter. Identical to Comment 5g.	See response to Comment 5g.
Duplicate	Maria Hernandez	N/A	29h	HazMat	Duplicate of form letter. Identical to Comment 5h.	See response to Comment 5h.
Duplicate	Maria Hernandez	N/A	29i	Military Presence	Duplicate of form letter. Identical to Comment 5i.	See response to Comment 5i.
Duplicate	Maria Hernandez	N/A	29j	Cumulative	Duplicate of form letter. Identical to Comment 5j.	See response to Comment 5j.
Public	Kallen Perez	N/A	30/31/32/33	Military Presence	"I oppose this project as it presents Guam as a first-strike community. I oppose any further build of Guam to cater to the military or US forces in the Pacific. I am a resident of Agana Heights, a graduate of UOG, and a mother of 3. All the ways that Guam has been used as the tip of the spear and the ways that it is continued to be exploited as an asset to the US military makes me worry for the future of my children. I demand true diplomacy and peace instead of continued wars in defense of capitalism. Signed, Kallen Perez"	Comment noted. Topics such as global military tensions and war experiences are important issues but are outside the scope of NEPA and the EIS. National and local security is an important topic that is considered in all DoD decision making. The public scoping period provided an indirect avenue for concerned citizens to inform decision makers about their views on such issues but discussion on such issues will not be included in the Draft EIS. However, this comment is an important contribution to the NEPA process and will be considered in the decision-making process.
Public	Othilia Rose TAitano F. Boyd-Farrell	N/A	34a	Scoping/ Alternatives	Duplicate of form letter. Identical to Comment 5a.	See response to Comment 5a.
Duplicate	Othilia Rose TAitano F. Boyd-Farrell	N/A	34b	Biological Resources	Duplicate of form letter. Identical to Comment 5b.	See response to Comment 5b.
Duplicate	Othilia Rose TAitano F. Boyd-Farrell	N/A	34c	Water Resources	Duplicate of form letter. Identical to Comment 5c.	See response to Comment 5c.
Duplicate	Othilia Rose TAitano F. Boyd-Farrell	N/A	34d	HazMat	Duplicate of form letter. Identical to Comment 5d.	See response to Comment 5d.

Contact Type	Name	Organization	Comment ID	Theme(s)	Comment	Response
Duplicate	Othilia Rose TAitano F. Boyd-Farrell	N/A	34e	AQ/ Noise/ Water/ HazMat	Duplicate of form letter. Identical to Comment 5e.	See response to Comment 5e.
Duplicate	Othilia Rose TAitano F. Boyd-Farrell	N/A	34f	Infrastructure/ Transportation/ Socioeconomics/ EJ	Duplicate of form letter. Identical to Comment 5f.	See response to Comment 5f.
Duplicate	Othilia Rose TAitano F. Boyd-Farrell	N/A	34g	Cultural Resources	Duplicate of form letter. Identical to Comment 5g.	See response to Comment 5g.
Duplicate	Othilia Rose TAitano F. Boyd-Farrell	N/A	34h	HazMat	Duplicate of form letter. Identical to Comment 5h.	See response to Comment 5h.
Duplicate	Othilia Rose TAitano F. Boyd-Farrell	N/A	34i	Military Presence	Duplicate of form letter. Identical to Comment 5i.	See response to Comment 5i.
Duplicate	Othilia Rose TAitano F. Boyd-Farrell	N/A	34j	Cumulative	Duplicate of form letter. Identical to Comment 5j.	See response to Comment 5j.
Public	April Colitoy	N/A	35a	Scoping/ Alternatives	Duplicate of form letter. Identical to Comment 5a.	See response to Comment 5a.
Duplicate	April Colitoy	N/A	35b	Biological Resources	Duplicate of form letter. Identical to Comment 5b.	See response to Comment 5b.
Duplicate	April Colitoy	N/A	35c	Water Resources	Duplicate of form letter. Identical to Comment 5c.	See response to Comment 5c.
Duplicate	April Colitoy	N/A	35d	HazMat	Duplicate of form letter. Identical to Comment 5d.	See response to Comment 5d.
Duplicate	April Colitoy	N/A	35e	AQ/ Noise/ Water/ HazMat	Duplicate of form letter. Identical to Comment 5e.	See response to Comment 5e.
Duplicate	April Colitoy	N/A	35f	Infrastructure/ Transportation/ Socioeconomics/ EJ	Duplicate of form letter. Identical to Comment 5f.	See response to Comment 5f.
Duplicate	April Colitoy	N/A	35g	Cultural Resources	Duplicate of form letter. Identical to Comment 5g.	See response to Comment 5g.

Contact Type	Name	Organization	Comment ID	Theme(s)	Comment	Response
Duplicate	April Colitoy	N/A	35h	HazMat	Duplicate of form letter. Identical to Comment 5h.	See response to Comment 5h.
Duplicate	April Colitoy	N/A	35i	Military Presence	Duplicate of form letter. Identical to Comment 5i.	See response to Comment 5i.
Duplicate	April Colitoy	N/A	35j	Cumulative	Duplicate of form letter. Identical to Comment 5j.	See response to Comment 5j.
Public	Såhi Velasco	N/A	37a	Scoping/ Alternatives	Duplicate of form letter. Identical to Comment 5a.	See response to Comment 5a.
Duplicate	Såhi Velasco	N/A	37b	Biological Resources	Duplicate of form letter. Identical to Comment 5b.	See response to Comment 5b.
Duplicate	Såhi Velasco	N/A	37c	Water Resources	Duplicate of form letter. Identical to Comment 5c.	See response to Comment 5c.
Duplicate	Såhi Velasco	N/A	37d	HazMat	Duplicate of form letter. Identical to Comment 5d.	See response to Comment 5d.
Duplicate	Såhi Velasco	N/A	37e	AQ/ Noise/ Water/ HazMat	Duplicate of form letter. Identical to Comment 5e.	See response to Comment 5e.
Duplicate	Såhi Velasco	N/A	37f	Infrastructure/ Transportation/ Socioeconomics/ EJ	Duplicate of form letter. Identical to Comment 5f.	See response to Comment 5f.
Duplicate	Såhi Velasco	N/A	37g	Cultural Resources	Duplicate of form letter. Identical to Comment 5g.	See response to Comment 5g.
Duplicate	Såhi Velasco	N/A	37h	HazMat	Duplicate of form letter. Identical to Comment 5h.	See response to Comment 5h.
Duplicate	Såhi Velasco	N/A	37i	Military Presence	Duplicate of form letter. Identical to Comment 5i.	See response to Comment 5i.
Duplicate	Såhi Velasco	N/A	37j	Cumulative	Duplicate of form letter. Identical to Comment 5j.	See response to Comment 5j.
Public	Andrea Quitugua	N/A	38a	Scoping/ Alternatives	Duplicate of form letter. Identical to Comment 5a.	See response to Comment 5a.
Duplicate	Andrea Quitugua	N/A	38b	Biological Resources	Duplicate of form letter. Identical to Comment 5b.	See response to Comment 5b.
Duplicate	Andrea Quitugua	N/A	38c	Water Resources	Duplicate of form letter. Identical to Comment 5c.	See response to Comment 5c.

Contact Type	Name	Organization	Comment ID	Theme(s)	Comment	Response
Duplicate	Andrea Quitugua	N/A	38d	HazMat	Duplicate of form letter. Identical to Comment 5d.	See response to Comment 5d.
Duplicate	Andrea Quitugua	N/A	38e	AQ/ Noise/ Water/ HazMat	Duplicate of form letter. Identical to Comment 5e.	See response to Comment 5e.
Duplicate	Andrea Quitugua	N/A	38f	Infrastructure/ Transportation/ Socioeconomics/ EJ	Duplicate of form letter. Identical to Comment 5f.	See response to Comment 5f.
Duplicate	Andrea Quitugua	N/A	38g	Cultural Resources	Duplicate of form letter. Identical to Comment 5g.	See response to Comment 5g.
Duplicate	Andrea Quitugua	N/A	38h	HazMat	Duplicate of form letter. Identical to Comment 5h.	See response to Comment 5h.
Duplicate	Andrea Quitugua	N/A	38i	Military Presence	Duplicate of form letter. Identical to Comment 5i.	See response to Comment 5i.
Duplicate	Andrea Quitugua	N/A	38j	Cumulative	Duplicate of form letter. Identical to Comment 5j.	See response to Comment 5j.

Contact Type	Name	Organization	Comment ID	Theme(s)	Comment	Response
Local Agency	Guam Power Authority	Guam Power Authority	39	Infrastructure	"Guam's strategic importance is difficult to overstate." This statement from Navy Admiral John C. Aquilino's, Commander of INDOPACOM, testimony to the House of Representatives in May 2022 stressed the major role an island a mere 212 square meters continues to play in U.S. national security and the larger global defense. The Indo-Pacific occupies a central role in U.S. national strategy, and Guam's location in the Pacific Ocean lends to the island's military advantage. Home to an estimated 170,000 U.S. citizens, Guam is the westernmost U.S. territory in the Indo-Pacific region and is geographically closer to Beijing than Hawaii. In an effort to improve the U.S. military's flexibility to address conventional and terrorist threats worldwide, the Department of Defense (DOD) plans to relocate around 5,000 Marines to Guam in addition to the 6,400 active-duty service members currently stationed as well as expand other U.S. force capabilities on the island. At present, Guam a critical forward operating base for the U.S. military in the Pacific, essential for supporting power projection by the U.S. and its allies in the region.	The Draft EIS will include information and analysis on utility and infrastructure requirements. The Draft EIS also will consider present and future projects, such as the Guam and CNMI military relocation, in the cumulative impacts analysis.

Contact Type	Name	Organization	Comment ID	Theme(s)	Comment	Response
Duplicate	Guam Power Authority	Guam Power Authority	39	Infrastructure	Growth In line with the expansion of U.S. force capabilities, the proposal to bed down up to 12 Singapore F-15 fighter aircraft at Andersen Air Force Base and to construct critical infrastructure enhances U.S. posture west of the international date line. This would require a new hangar and more ramp space to accommodate the Singapore Eagles, along with maintenance and other support facilities, fuel systems, earth-covered ammunition storage and other infrastructure. The new facilities would be built on 209 acres over three to seven years and could also support other U.S. or foreign units. The project would provide critical infrastructure that enhances U.S. posture west of the International Date Line, support American and friendly forces, and strengthen the U.S.'s ability to respond to threats in the region and throughout the globe. Specifically, it shows U.S. commitment to the broadening and strengthening of its partnerships in the Indo-Asia Pacific Region. However, investing in U.S. national security inside the fence must also mean investing in Guam's critical infrastructure outside the fence to enhance readiness and the resilience of the military facilities on the island. Neither natural disasters nor threats from bad actors discriminate between what is inside versus outside the fence line.	See response above.

Contact Type	Name	Organization	Comment ID	Theme(s)	Comment	Response
Duplicate	Guam Power Authority	Guam Power Authority	39	Infrastructure	On May 24, 2023, Guam experienced one of the strongest typhoons in 20 years. Typhoon Mawar blew across Guam, with sustained winds reaching 140 mph (230 km/h), gusts approaching 160 mph (260 km/h), and rainfall peaking at 28.42 inches—damaging buildings, leveling trees, and cutting electricity and access to water for most of the island residents. The Guam Power Authority (GPA) worked tirelessly to restore electricity to the island—knowing all too well that a successful recovery hinges upon timely power restoration. In a little over a month, nearly 98% of the island's power was restored—a third of the time it took to fully recover from Typhoon Pongsona. Indeed, Guam was in a better position after Typhoon Mawar compared to the island's last major storm in over two decades. Since then, 98% of power poles are concrete or steel instead of wood, and nearly 25% of Guam's power customers receive their power through underground lines. While most of the civilian population lost power during the typhoon, transmission lines feeding Camp Blaz and Andersen Air Force Base did not go down due to the underground mitigation efforts of GPA. In contrast, Naval Base Guam, which is primarily serviced through overhead transmission lines, were among those affected by the loss of power.	See response above.

Contact Type	Name	Organization	Comment ID	Theme(s)	Comment	Response
Duplicate	Guam Power Authority	Guam Power Authority	39	Infrastructure	It is clear that the readiness of U.S. military personnel and facilities on Guam are linked to the civilian-owned and -operated infrastructure outside of military installations. GPA is the sole energy provider for the island—a significant hit to the power grid, whether it be from climate threats or bad actors, puts Guam, and the nation as a whole, at serious risk. Strong investment in critical infrastructure must be made to ensure the island is ready to provide adequate defense. At present, the U.S. military is GPA's largest customer, accounting for 20% of Guam's electricity use. This energy use is anticipated to increase as military presence grows on the island, and reliable energy production is a critical component for any military installation. This energy use is anticipated to increase as military presence grows on the island, and reliable energy production is a critical component for any military installation. A significant hit to the power grid puts Guam, and the nation as a whole, at serious risk. GPA has taken significant steps to improve system resiliency and efficiency by installing hardened power poles, smart grid technology, and undergrounding vital power lines. GPA is also committed to increasing renewable energy through investing in solar PV and energy storage systems. However, it is clear that any future investments to the grid must consider the growing military presence on the island.	See response above.

Contact Type	Name	Organization	Comment ID	Theme(s)	Comment	Response
Duplicate	Guam Power Authority	Guam Power Authority	39	Infrastructure	This sentiment is reiterated in the "One Guam, Green Guam" approach to the military buildup, which focuses on investing in capabilities on Guam that are sustainable, based on clean energy, and will reduce the high cost of energy. This commits DoD to developing the most energy efficient infrastructure possible and supporting Guam's renewable energy investments–helping to secure the funding necessary to build a greener, more resilient Guam. GPA has been leading the way in renewable energy transition. GPA's Clean Energy Master Plan (CEMP) is a comprehensive plan for transitioning Guam from legacy fossil fuel fired generation to renewable energy and non-greenhouse gas emissions electric energy supply. The Clean Energy Master Plan is a living document and is continuously being updated. GPA is committed to providing 50% of the island's electric power from renewable or non-greenhouse gas emissions sources by 2030 and 100% by 2040. To facilitate this transition, investments must be made to the utility infrastructure. One such investment would be the installation of a 180MW battery energy storage system (BESS). As Guam's only power provider, GPA must ensure they have an adequate supply of generation capacity to reliably meet demand during peak time. If the power supply cannot meet demand, the frequency drops. If the frequency falls too much, it can lead to a complete collapse of the grid.	See response above.

Contact Type	Name	Organization	Comment ID	Theme(s)	Comment	Response
Duplicate	Guam Power Authority	Guam Power Authority	39	Infrastructure	In the event of frequency instability, underfrequency load shedding (UFLS) is activated in order to avoid power cuts. The installation of BESS can effectively contribute to enhancing frequency stability of isolated power systems by injecting active power after a disturbance quickly and thus avoiding or reducing load shedding. A grid-connected BESS, coupled with renewable energy, also has the added benefit of providing power in the event of a grid outage. If the grid goes down, the BESS can become a power supply for extended periods of time–decreasing the size of generation systems used solely as backup power, creating redundancy, and establishing a renewable backup system. While GPA is committed to the transition to renewable energy, additional work must be done to protect current utility infrastructure. Extreme weather events remain a serious threat to Guam and are likely to become more and more common—severely affecting human life and critical infrastructure. Undergrounding is the most reliable, robust, and resilient solution to address the root causes of outages while minimizing the total cost to customers. It is because of the mitigation projects and GPA's continued maintenance of the electrical grid that key military installments such as Andersen Air Force Base and Camp Blaz did not lose power during the typhoon. While underground mitigation efforts were successful in the maintenance of power services to AAFB and Camp Blaz, GPA will pursue the undergrounding of additional transmission lines to ensure redundancy of the transmission system.	See response above.

Contact Type	Name	Organization	Comment ID	Theme(s)	Comment	Response
Duplicate	Guam Power Authority	Guam Power Authority	39	Infrastructure	This means if a substation feeding military installments goes down, power can still be transmitted from another source. These mitigation efforts become even more imperative as the U.S. military increases their presence on island thus increasing their demand for reliable and resilient energy services. Although the upfront cost of undergrounding power lines can be high, the lifecycle cost-benefit calculation of undergrounding justifies these costs. Underground power has minimal maintenance and operating costs while providing customers great benefits—proving to be a dependable solution. The impacts of weather events such as typhoons, high winds, and lightning are greatly reduced by placing lines underground. Additionally, the risk of power outages due to flying debris, fallen trees, and branches becomes minimal. By reducing these risks, GPA will further reduce outage-caused downtime for its customers. Investment in Guam's infrastructure by the federal government is necessary for military resilience and efficiency and will provide returns in the future. This requires strong partnership between the federal government and local government agencies in order to mitigate Guam's vulnerability to potential military conflicts and natural disasters. It is critical to strengthen Guam's electrical grid infrastructure as part of the One Guam approach.	See response above.

Contact Type	Name	Organization	Comment ID	Theme(s)	Comment	Response
Public	Toni Brooks	N/A	40a	Scoping/ Alternatives	Duplicate of form letter. Identical to Comment 5a.	See response to Comment 5a.
Duplicate	Toni Brooks	N/A	40b	Biological Resources	Duplicate of form letter. Identical to Comment 5b.	See response to Comment 5b.
Duplicate	Toni Brooks	N/A	40c	Water Resources	Duplicate of form letter. Identical to Comment 5c.	See response to Comment 5c.
Duplicate	Toni Brooks	N/A	40d	HazMat	Duplicate of form letter. Identical to Comment 5d.	See response to Comment 5d.
Duplicate	Toni Brooks	N/A	40e	AQ/ Noise/ Water/ HazMat	Duplicate of form letter. Identical to Comment 5e.	See response to Comment 5e.
Duplicate	Toni Brooks	N/A	40f	Noise	As a USAF veteran who worked on fighter jets while I was in the military, I know just how loud these aircraft can get. And being familiar with the flight paths available at Andersen Air Force Base, these jets will produce decibel levels well above the threshold of pain on a regular basis. As a veteran just outside of the impact zone who already suffers hearing loss, I do not want anyone else to experience what I have. I am against bringing any aircraft to Guam that will add noise pollution to the community. I am against bringing any aircraft to Guam that would result in condemning homes for any reason including noise pollution, radiation, and potential crash zones.	The Draft EIS will include information and analysis regarding noise from aircraft operations.
Duplicate	Toni Brooks	N/A	40g	Cultural Resources	Duplicate of form letter. Identical to Comment 5g.	See response to Comment 5g.
Duplicate	Toni Brooks	N/A	40h	HazMat	Duplicate of form letter. Identical to Comment 5h.	See response to Comment 5h.
Duplicate	Toni Brooks	N/A	40i	Military Presence	Duplicate of form letter. Identical to Comment 5i.	See response to Comment 5i.
Duplicate	Toni Brooks	N/A	40j	Cumulative	Duplicate of form letter. Identical to Comment 5j.	See response to Comment 5j.

Contact Type	Name	Organization	Comment ID	Theme(s)	Comment	Response
Public	Mika Paulino	N/A	41/42a	Scoping/ Alternatives	Duplicate of form letter. Identical to Comment 5a.	See response to Comment 5a.
Duplicate	Mika Paulino	N/A	41/42b	Biological Resources	Duplicate of form letter. Identical to Comment 5b.	See response to Comment 5b.
Duplicate	Mika Paulino	N/A	41/42c	Water Resources	Duplicate of form letter. Identical to Comment 5c.	See response to Comment 5c.
Duplicate	Mika Paulino	N/A	41/42d	HazMat	Duplicate of form letter. Identical to Comment 5d.	See response to Comment 5d.
Duplicate	Mika Paulino	N/A	41/42e	AQ/ Noise/ Water/ HazMat	Duplicate of form letter. Identical to Comment 5e.	See response to Comment 5e.
Duplicate	Mika Paulino	N/A	41/42f	Infrastructure/ Transportation/ Socioeconomics/ EJ	Duplicate of form letter. Identical to Comment 5f.	See response to Comment 5f.
Duplicate	Mika Paulino	N/A	41/42g	Cultural Resources	Duplicate of form letter. Identical to Comment 5g.	See response to Comment 5g.
Duplicate	Mika Paulino	N/A	41/42h	HazMat	Duplicate of form letter. Identical to Comment 5h.	See response to Comment 5h.
Duplicate	Mika Paulino	N/A	41/42i	Military Presence	Duplicate of form letter. Identical to Comment 5i.	See response to Comment 5i.
Duplicate	Mika Paulino	N/A	41/42j	Cumulative	Duplicate of form letter. Identical to Comment 5j.	See response to Comment 5j.
Public	Molly Dennert	N/A	43a	Scoping/ Alternatives	Duplicate of form letter. Identical to Comment 5a.	See response to Comment 5a.
Duplicate	Molly Dennert	N/A	43b	Biological Resources	Duplicate of form letter. Identical to Comment 5b.	See response to Comment 5b.
Duplicate	Molly Dennert	N/A	43c	Water Resources	Duplicate of form letter. Identical to Comment 5c.	See response to Comment 5c.
Duplicate	Molly Dennert	N/A	43d	HazMat	Duplicate of form letter. Identical to Comment 5d.	See response to Comment 5d.
Duplicate	Molly Dennert	N/A	43e	AQ/ Noise/ Water/ HazMat	Duplicate of form letter. Identical to Comment 5e.	See response to Comment 5e.

Contact Type	Name	Organization	Comment ID	Theme(s)	Comment	Response
Duplicate	Molly Dennert	N/A	43f	Infrastructure/ Transportation/ Socioeconomics/ EJ	Duplicate of form letter. Identical to Comment 5f.	See response to Comment 5f.
Duplicate	Molly Dennert	N/A	43g	Cultural Resources	Duplicate of form letter. Identical to Comment 5g.	See response to Comment 5g.
Duplicate	Molly Dennert	N/A	43h	HazMat	Duplicate of form letter. Identical to Comment 5h.	See response to Comment 5h.
Duplicate	Molly Dennert	N/A	43i	Military Presence	Duplicate of form letter. Identical to Comment 5i.	See response to Comment 5i.
Duplicate	Molly Dennert	N/A	43j	Cumulative	Duplicate of form letter. Identical to Comment 5j.	See response to Comment 5j.
Public	Jourdene Aguon	N/A	44a	Scoping/ Alternatives	Duplicate of form letter. Identical to Comment 5a.	See response to Comment 5a.
Duplicate	Jourdene Aguon	N/A	44b	Biological Resources	Duplicate of form letter. Identical to Comment 5b.	See response to Comment 5b.
Duplicate	Jourdene Aguon	N/A	44c	Water Resources	Duplicate of form letter. Identical to Comment 5c.	See response to Comment 5c.
Duplicate	Jourdene Aguon	N/A	44d	HazMat	Duplicate of form letter. Identical to Comment 5d.	See response to Comment 5d.
Duplicate	Jourdene Aguon	N/A	44e	AQ/ Noise/ Water/ HazMat	Duplicate of form letter. Identical to Comment 5e.	See response to Comment 5e.
Duplicate	Jourdene Aguon	N/A	44f	Infrastructure/ Transportation/ Socioeconomics/ EJ	Duplicate of form letter. Identical to Comment 5f.	See response to Comment 5f.
Duplicate	Jourdene Aguon	N/A	44g	Cultural Resources	Duplicate of form letter. Identical to Comment 5g.	See response to Comment 5g.
Duplicate	Jourdene Aguon	N/A	44h	HazMat	Duplicate of form letter. Identical to Comment 5h.	See response to Comment 5h.
Duplicate	Jourdene Aguon	N/A	44i	Military Presence	Duplicate of form letter. Identical to Comment 5i.	See response to Comment 5i.
Duplicate	Jourdene Aguon	N/A	44j	Cumulative	Duplicate of form letter. Identical to Comment 5j.	See response to Comment 5j.

Contact Type	Name	Organization	Comment ID	Theme(s)	Comment	Response
Public	Ariana Millard	N/A	45a	Scoping/ Alternatives	Duplicate of form letter. Identical to Comment 5a.	See response to Comment 5a.
Duplicate	Ariana Millard	N/A	45b	Biological Resources	Duplicate of form letter. Identical to Comment 5b.	See response to Comment 5b.
Duplicate	Ariana Millard	N/A	45c	Water Resources	Duplicate of form letter. Identical to Comment 5c.	See response to Comment 5c.
Duplicate	Ariana Millard	N/A	45d	HazMat	Duplicate of form letter. Identical to Comment 5d.	See response to Comment 5d.
Duplicate	Ariana Millard	N/A	45e	AQ/ Noise/ Water/ HazMat	Duplicate of form letter. Identical to Comment 5e.	See response to Comment 5e.
Duplicate	Ariana Millard	N/A	45f	Infrastructure/ Transportation/ Socioeconomics/ EJ	Duplicate of form letter. Identical to Comment 5f.	See response to Comment 5f.
Duplicate	Ariana Millard	N/A	45g	Cultural Resources	Duplicate of form letter. Identical to Comment 5g.	See response to Comment 5g.
Duplicate	Ariana Millard	N/A	45h	HazMat	Duplicate of form letter. Identical to Comment 5h.	See response to Comment 5h.
Duplicate	Ariana Millard	N/A	45i	Military Presence	Duplicate of form letter. Identical to Comment 5i.	See response to Comment 5i.
Duplicate	Ariana Millard	N/A	45j	Cumulative	Duplicate of form letter. Identical to Comment 5j.	See response to Comment 5j.
Public	Kira Powers	N/A	46a	Scoping/ Alternatives	Duplicate of form letter. Identical to Comment 5a.	See response to Comment 5a.
Duplicate	Kira Powers	N/A	46b	Biological Resources	Duplicate of form letter. Identical to Comment 5b.	See response to Comment 5b.
Duplicate	Kira Powers	N/A	46c	Water Resources	Duplicate of form letter. Identical to Comment 5c.	See response to Comment 5c.
Duplicate	Kira Powers	N/A	46d	HazMat	Duplicate of form letter. Identical to Comment 5d.	See response to Comment 5d.
Duplicate	Kira Powers	N/A	46e	AQ/ Noise/ Water/ HazMat	Duplicate of form letter. Identical to Comment 5e.	See response to Comment 5e.

Contact Type	Name	Organization	Comment ID	Theme(s)	Comment	Response
Duplicate	Kira Powers	N/A	46f	Infrastructure/ Transportation/ Socioeconomics/ EJ	Duplicate of form letter. Identical to Comment 5f.	See response to Comment 5f.
Duplicate	Kira Powers	N/A	46g	Cultural Resources	Duplicate of form letter. Identical to Comment 5g.	See response to Comment 5g.
Duplicate	Kira Powers	N/A	46h	HazMat	Duplicate of form letter. Identical to Comment 5h.	See response to Comment 5h.
Duplicate	Kira Powers	N/A	46i	Military Presence	Duplicate of form letter. Identical to Comment 5i.	See response to Comment 5i.
Duplicate	Kira Powers	N/A	46j	Cumulative	Duplicate of form letter. Identical to Comment 5j.	See response to Comment 5j.
Public	Alyssa Posadas	N/A	47a	Scoping/ Alternatives	Duplicate of form letter. Identical to Comment 5a.	See response to Comment 5a.
Duplicate	Alyssa Posadas	N/A	47b	Biological Resources	Duplicate of form letter. Identical to Comment 5b.	See response to Comment 5b.
Duplicate	Alyssa Posadas	N/A	47c	Water Resources	Duplicate of form letter. Identical to Comment 5c.	See response to Comment 5c.
Duplicate	Alyssa Posadas	N/A	47d	HazMat	Duplicate of form letter. Identical to Comment 5d.	See response to Comment 5d.
Duplicate	Alyssa Posadas	N/A	47e	AQ/ Noise/ Water/ HazMat	Duplicate of form letter. Identical to Comment 5e.	See response to Comment 5e.
Duplicate	Alyssa Posadas	N/A	47f	Infrastructure/ Transportation/ Socioeconomics/ EJ	Duplicate of form letter. Identical to Comment 5f.	See response to Comment 5f.
Duplicate	Alyssa Posadas	N/A	47g	Cultural Resources	Duplicate of form letter. Identical to Comment 5g.	See response to Comment 5g.
Duplicate	Alyssa Posadas	N/A	47h	HazMat	Duplicate of form letter. Identical to Comment 5h.	See response to Comment 5h.
Duplicate	Alyssa Posadas	N/A	47i	Military Presence	Duplicate of form letter. Identical to Comment 5i.	See response to Comment 5i.
Duplicate	Alyssa Posadas	N/A	47j	Cumulative	Duplicate of form letter. Identical to Comment 5j.	See response to Comment 5j.

Contact Type	Name	Organization	Comment ID	Theme(s)	Comment	Response
Public	Adrienne Rosenberg	N/A	48a	Scoping/ Alternatives	Duplicate of form letter. Identical to Comment 5a.	See response to Comment 5a.
Duplicate	Adrienne Rosenberg	N/A	48b	Biological Resources	Duplicate of form letter. Identical to Comment 5b.	See response to Comment 5b.
Duplicate	Adrienne Rosenberg	N/A	48c	Water Resources	Duplicate of form letter. Identical to Comment 5c.	See response to Comment 5c.
Duplicate	Adrienne Rosenberg	N/A	48d	HazMat	Duplicate of form letter. Identical to Comment 5d.	See response to Comment 5d.
Duplicate	Adrienne Rosenberg	N/A	48e	AQ/ Noise/ Water/ HazMat	Duplicate of form letter. Identical to Comment 5e.	See response to Comment 5e.
Duplicate	Adrienne Rosenberg	N/A	48f	Infrastructure/ Transportation/ Socioeconomics/ EJ	Duplicate of form letter. Identical to Comment 5f.	See response to Comment 5f.
Duplicate	Adrienne Rosenberg	N/A	48g	Cultural Resources	Duplicate of form letter. Identical to Comment 5g.	See response to Comment 5g.
Duplicate	Adrienne Rosenberg	N/A	48h	HazMat	Duplicate of form letter. Identical to Comment 5h.	See response to Comment 5h.
Duplicate	Adrienne Rosenberg	N/A	48i	Military Presence	Duplicate of form letter. Identical to Comment 5i.	See response to Comment 5i.
Duplicate	Adrienne Rosenberg	N/A	48j	Cumulative	Duplicate of form letter. Identical to Comment 5j.	See response to Comment 5j.
Public	Julie	N/A	49a	Scoping/ Alternatives	I oppose the proposed F-15 beddown and infrastructure upgrades at Andersen Air Force Base due to the harmful effects on the community and environment of Guam and the Mariåna Islands. There is already a long history of countless violations of indigenous and human rights including loss of access, destruction of native species, severe contamination, and serious desecration of sacred sites and ancestral remains, all of which continue to occur at several military construction and operation sites around Guam. [Comment also includes duplicate content identical to Comment 5a.]	See response to Comment 5a.

Contact Type	Name	Organization	Comment ID	Theme(s)	Comment	Response
Duplicate	Julie	N/A	49b	Biological Resources	Duplicate of form letter. Identical to Comment 5b.	See response to Comment 5b.
Duplicate	Julie	N/A	49c	Water Resources	Duplicate of form letter. Identical to Comment 5c.	See response to Comment 5c.
Duplicate	Julie	N/A	49d	HazMat	Duplicate of form letter. Identical to Comment 5d.	See response to Comment 5d.
Duplicate	Julie	N/A	49e	AQ/ Noise/ Water/ HazMat	Duplicate of form letter. Identical to Comment 5e.	See response to Comment 5e.
Duplicate	Julie	N/A	49f	Infrastructure/ Transportation/ Socioeconomics/ EJ	Duplicate of form letter. Identical to Comment 5f.	See response to Comment 5f.
Duplicate	Julie	N/A	49g	Cultural Resources	Duplicate of form letter. Identical to Comment 5g.	See response to Comment 5g.
Duplicate	Julie	N/A	49h	HazMat	Duplicate of form letter. Identical to Comment 5h.	See response to Comment 5h.
Duplicate	Julie	N/A	49i	Military Presence	Duplicate of form letter. Identical to Comment 5i.	See response to Comment 5i.
Duplicate	Julie	N/A	49j	Cumulative	Duplicate of form letter. Identical to Comment 5j.	See response to Comment 5j.
Public	Endria Richardson	N/A	50a	Scoping/ Alternatives	Duplicate of form letter. Identical to Comment 5a.	See response to Comment 5a.
Duplicate	Endria Richardson	N/A	50b	Biological Resources	Duplicate of form letter. Identical to Comment 5b.	See response to Comment 5b.
Duplicate	Endria Richardson	N/A	50c	Water Resources	Duplicate of form letter. Identical to Comment 5c.	See response to Comment 5c.
Duplicate	Endria Richardson	N/A	50d	HazMat	Duplicate of form letter. Identical to Comment 5d.	See response to Comment 5d.
Duplicate	Endria Richardson	N/A	50e	AQ/ Noise/ Water/ HazMat	Duplicate of form letter. Identical to Comment 5e.	See response to Comment 5e.
Duplicate	Endria Richardson	N/A	50f	Infrastructure/ Transportation/ Socioeconomics/ EJ	Duplicate of form letter. Identical to Comment 5f.	See response to Comment 5f.

Contact Type	Name	Organization	Comment ID	Theme(s)	Comment	Response
Duplicate	Endria Richardson	N/A	50g	Cultural Resources	Duplicate of form letter. Identical to Comment 5g.	See response to Comment 5g.
Duplicate	Endria Richardson	N/A	50h	HazMat	Duplicate of form letter. Identical to Comment 5h.	See response to Comment 5h.
Duplicate	Endria Richardson	N/A	50i	Military Presence	Duplicate of form letter. Identical to Comment 5i.	See response to Comment 5i.
Duplicate	Endria Richardson	N/A	50j	Cumulative	Duplicate of form letter. Identical to Comment 5j.	See response to Comment 5j.
Public	Mare Aquiningoc	N/A	51a	Scoping/ Alternatives	Duplicate of form letter. Identical to Comment 5a.	See response to Comment 5a.
Duplicate	Mare Aquiningoc	N/A	51b	Biological Resources	Duplicate of form letter. Identical to Comment 5b.	See response to Comment 5b.
Duplicate	Mare Aquiningoc	N/A	51c	Water Resources	Duplicate of form letter. Identical to Comment 5c.	See response to Comment 5c.
Duplicate	Mare Aquiningoc	N/A	51d	HazMat	Duplicate of form letter. Identical to Comment 5d.	See response to Comment 5d.
Duplicate	Mare Aquiningoc	N/A	51e	AQ/ Noise/ Water/ HazMat	Duplicate of form letter. Identical to Comment 5e.	See response to Comment 5e.
Duplicate	Mare Aquiningoc	N/A	51f	Infrastructure/ Transportation/ Socioeconomics/ EJ	Duplicate of form letter. Identical to Comment 5f.	See response to Comment 5f.
Duplicate	Mare Aquiningoc	N/A	51g	Cultural Resources	Duplicate of form letter. Identical to Comment 5g.	See response to Comment 5g.
Duplicate	Mare Aquiningoc	N/A	51h	HazMat	Duplicate of form letter. Identical to Comment 5h.	See response to Comment 5h.
Duplicate	Mare Aquiningoc	N/A	51i	Military Presence	Duplicate of form letter. Identical to Comment 5i.	See response to Comment 5i.
Duplicate	Mare Aquiningoc	N/A	51j	Cumulative	Duplicate of form letter. Identical to Comment 5j.	See response to Comment 5j.
Public	Danita Aquiningoc	N/A	52/53a	Scoping/ Alternatives	Duplicate of form letter. Identical to Comment 5a.	See response to Comment 5a.
Duplicate	Danita Aquiningoc	N/A	52/53b	Biological Resources	Duplicate of form letter. Identical to Comment 5b.	See response to Comment 5b.

Contact Type	Name	Organization	Comment ID	Theme(s)	Comment	Response
Duplicate	Danita Aquiningoc	N/A	52/53c	Water Resources	Duplicate of form letter. Identical to Comment 5c.	See response to Comment 5c.
Duplicate	Danita Aquiningoc	N/A	52/53d	HazMat	Duplicate of form letter. Identical to Comment 5d.	See response to Comment 5d.
Duplicate	Danita Aquiningoc	N/A	52/53e	AQ/ Noise/ Water/ HazMat	Duplicate of form letter. Identical to Comment 5e.	See response to Comment 5e.
Duplicate	Danita Aquiningoc	N/A	52/53f	Infrastructure/ Transportation/ Socioeconomics/ EJ	Duplicate of form letter. Identical to Comment 5f.	See response to Comment 5f.
Duplicate	Danita Aquiningoc	N/A	52/53g	Cultural Resources	Duplicate of form letter. Identical to Comment 5g.	See response to Comment 5g.
Duplicate	Danita Aquiningoc	N/A	52/53h	HazMat	Duplicate of form letter. Identical to Comment 5h.	See response to Comment 5h.
Duplicate	Danita Aquiningoc	N/A	52/53i	Military Presence	Duplicate of form letter. Identical to Comment 5i.	See response to Comment 5i.
Duplicate	Danita Aquiningoc	N/A	52/53j	Cumulative	Duplicate of form letter. Identical to Comment 5j.	See response to Comment 5j.
Public	Bean Yogi	N/A	54a	Scoping/ Alternatives	Duplicate of form letter. Identical to Comment 5a.	See response to Comment 5a.
Duplicate	Bean Yogi	N/A	54b	Biological Resources	Duplicate of form letter. Identical to Comment 5b.	See response to Comment 5b.
Duplicate	Bean Yogi	N/A	54c	Water Resources	Duplicate of form letter. Identical to Comment 5c.	See response to Comment 5c.
Duplicate	Bean Yogi	N/A	54d	HazMat	Duplicate of form letter. Identical to Comment 5d.	See response to Comment 5d.
Duplicate	Bean Yogi	N/A	54e	AQ/ Noise/ Water/ HazMat	Duplicate of form letter. Identical to Comment 5e.	See response to Comment 5e.
Duplicate	Bean Yogi	N/A	54f	Infrastructure/ Transportation/ Socioeconomics/ EJ	Duplicate of form letter. Identical to Comment 5f.	See response to Comment 5f.
Duplicate	Bean Yogi	N/A	54g	Cultural Resources	Duplicate of form letter. Identical to Comment 5g.	See response to Comment 5g.

Contact Type	Name	Organization	Comment ID	Theme(s)	Comment	Response
Duplicate	Bean Yogi	N/A	54h	HazMat	Duplicate of form letter. Identical to Comment 5h.	See response to Comment 5h.
Duplicate	Bean Yogi	N/A	54i	Military Presence	Duplicate of form letter. Identical to Comment 5i.	See response to Comment 5i.
Duplicate	Bean Yogi	N/A	54j	Cumulative	Duplicate of form letter. Identical to Comment 5j.	See response to Comment 5j.
Public	Ikaikaonalani James	N/A	55a	Scoping/ Alternatives	Duplicate of form letter. Identical to Comment 5a.	See response to Comment 5a.
Duplicate	Ikaikaonalani James	N/A	55b	Biological Resources	Duplicate of form letter. Identical to Comment 5b.	See response to Comment 5b.
Duplicate	Ikaikaonalani James	N/A	55c	Water Resources	Duplicate of form letter. Identical to Comment 5c.	See response to Comment 5c.
Duplicate	Ikaikaonalani James	N/A	55d	HazMat	Duplicate of form letter. Identical to Comment 5d.	See response to Comment 5d.
Duplicate	Ikaikaonalani James	N/A	55e	AQ/ Noise/ Water/ HazMat	Duplicate of form letter. Identical to Comment 5e.	See response to Comment 5e.
Duplicate	Ikaikaonalani James	N/A	55f	Infrastructure/ Transportation/ Socioeconomics/ EJ	Duplicate of form letter. Identical to Comment 5f.	See response to Comment 5f.
Duplicate	Ikaikaonalani James	N/A	55g	Cultural Resources	Duplicate of form letter. Identical to Comment 5g.	See response to Comment 5g.
Duplicate	Ikaikaonalani James	N/A	55h	HazMat	Duplicate of form letter. Identical to Comment 5h.	See response to Comment 5h.
Duplicate	Ikaikaonalani James	N/A	55i	Military Presence	Duplicate of form letter. Identical to Comment 5i.	See response to Comment 5i.
Duplicate	Ikaikaonalani James	N/A	55j	Cumulative	Duplicate of form letter. Identical to Comment 5j.	See response to Comment 5j.

Contact Type	Name	Organization	Comment ID	Theme(s)	Comment	Response
Local Agency	Lola E. Leon Guerrero	Bureau of Statistics and Plans	56	CZMA	SUBJECT: Agency Scoping Comments for the U.S. Department of the Air Force Proposed Environmental Impact Statement for F-15 Beddown and Infrastructure Upgrades at Andersen Air Force Base, Guam Hafa Adai! Coastal Zone Management Act of 1972 (CZMA) provides a framework for the effective management, beneficial use, protection, and development of the coastal zone. Since 1979, the Guam Coastal Management Program (GCMP) has been the approved coastal zone management program (CZMP) for Guam, applying its capacities towards preserving, protecting, developing, and where possible, restoration or enhancement of the resources of Guam. CZMA Section 307 provides a strong voice for approved state CZMPs in the process of federal decision-making when it comes to federal actions, including federal activities, federal development projects, federal approval of federal licenses and permits, and federal funding provided to state and local government. In accordance with 15 CFR §930.30 all Federal agency activities including development projects affecting any coastal use or resource will be undertaken in a manner consistent to the maximum extent practicable with the enforceable policies of approved management programs.	A consistency determination or negative determination will be prepared and provided at the time of the Draft EIS release. The Draft EIS will include information on the CZMA and GCMP.

Contact Type	Name	Organization	Comment ID	Theme(s)	Comment	Response
Duplicate	Lola E. Leon Guerrero	Bureau of Statistics and Plans	56	CZMA	As stated in 15 CFR §930.37, a federal agency may use its NEPA documents as a vehicle for its consistency determination or negative determination, but "the federal agency's federal consistency obligations under the [CZMA] are independent of those required under NEPA and are not necessarily fulfilled by the submission of a NEPA document." The section continues, "If a Federal agency includes its consistency determination or negative determination in a NEPA document, the Federal agency shall ensure that the NEPA document includes the information and adheres to the timeframes required by this subpart. Federal agencies and State agencies should mutually agree on how to best coordinate the requirements of NEPA and the [CZMA]." The Department of the Air Force's (DAF) proposed 1) beddown and mission support of 12 RSAF F-15 fighter aircraft, which includes airfield operations, an increase in installation personnel, and periodic training; and the 2) the development of 209 acres for the construction of infrastructure upgrades at Andersen Air Force Base that includes airfield pavements, aircraft hangar, maintenance and utilities buildings, fuel systems, fencing and utilities, roadways, parking and munitions storage will significantly impact natural resources, the limestone forest and its ecosystem; and the community. These actions shall be subject to federal consistency, especially for federal activities and federal development projects.	See response above.

Contact Type	Name	Organization	Comment ID	Theme(s)	Comment	Response
Duplicate	Lola E. Leon Guerrero	Bureau of Statistics and Plans	56	CZMA	The Bureau of Statistics and Plans Guam Coastal Management Program (BSP GCMP) takes the position that a consistency determination, supporting evaluation GCMP's enforceable policies with regard to the activity, and description of the included activities, associated facilities, and their coastal effects is best for the review of the various activities covered under the EIS. This would involve the submission of the consistency determination upon the completion of the draft EIS on the consistency of the overall activity and related development projects, which would ultimately be subject to the decision document, followed by other consistency determinations on specific activities or development projects as final decisions are intended to occur, subject to the timeline set forth in 15 CFR §930.36(b)(1) or a different requirement should there be mutual agreement as provided in 15 CFR §930.36(b)(2). The contents of a consistency determination are described in 15 CFR §930.39, subsection (a) of which reads: The consistency determination shall include a brief statement indicating whether the proposed activity will be undertaken in a manner consistent to the maximum extent practicable with the enforceable policies of the management program. The statement must be based upon an evaluation of the relevant enforceable policies of the management program.	See response above.

Contact Type	Name	Organization	Comment ID	Theme(s)	Comment	Response
Duplicate	Lola E. Leon Guerrero	Bureau of Statistics and Plans	56	CZMA	A description of this evaluation shall be included in the consistency determination, or provided to the State agency simultaneously with the consistency determination if the evaluation is contained in another document. Where a Federal agency is aware, prior to its submission of its consistency determination, that its activity is not fully consistent with a management program's enforceable policies, the Federal agency shall describe in its consistency determination the legal authority that prohibits full consistency as required by § 930.32(a)(2). Where the Federal agency is not aware of any inconsistency until after submission of its consistency determination, the Federal agency shall submit its description of the legal authority that prohibits full consistency to the State agency as soon as possible, or before the end of the 90-day period described in § 930.36(b)(1). The consistency determination shall also include a detailed description of the activity, its associated facilities, and their coastal effects, and comprehensive data and information sufficient to support the Federal agency's consistency statement. The amount of detail in the evaluation of the enforceable policies, activity description and supporting information shall be commensurate with the expected coastal effects of the activity. The Federal agency may submit the necessary information in any manner it chooses so long as the requirements of this subpart are satisfied.	See response above.

Contact Type	Name	Organization	Comment ID	Theme(s)	Comment	Response
Duplicate	Lola E. Leon Guerrero	Bureau of Statistics and Plans	56	CZMA	Impacts to Coastal Uses and Natural Resources The federal activities and federal development projects covered by the proposed EIS shall be undertaken in a manner consistent to the maximum extent practicable with the enforceable policies of the management program. As mentioned above, the consistency determination will require detailed description of the activity, its associated facilities, their coastal effects, and data to support the Department of the Air Force's consistency statement. Full consideration of the activities, facilities, and their coastal effects will require more detailed information that will likely be available for the draft EIS. In addressing consistency with GCMP, DAF will need to determine the coastal effects that the proposed activities and facilities will have upon GCMP's enforceable policies, which are the 18 policies adopted by Executive Order 78-37. For most of the proposed sites, which are located on federally-controlled property, DAF's evaluation of its proposed activities and facilities should address reasonably foreseeable effects on Guam's coastal zone. Reasonably foreseeable effects can be direct or indirect (cumulative and secondary) which result from the activity. In accordance with 15 CFR §930.11(g), "Indirect effects are effects resulting from the incremental impact of the federal action when added to other past, present, and reasonably foreseeable actions, regardless of what person(s) undertake(s) such actions." Coastal uses or resources are described in 15 CFR §930.11(b), which states:	See response above.

Contact Type	Name	Organization	Comment ID	Theme(s)	Comment	Response
Duplicate	Lola E. Leon Guerrero	Bureau of Statistics and Plans	56	CZMA	The phrase ‘‘any coastal use or resource’’ means any land or water use or natural resource of the coastal zone. Land and water uses, or coastal uses, are defined in sections 304(10) and (18) of the act, respectively, and include, but are not limited to, public access, recreation, fishing, historic or cultural preservation, development, hazards management, marinas and floodplain management, scenic and aesthetic enjoyment, and resource creation or restoration projects. Natural resources include biological or physical resources that are found within a State’s coastal zone on a regular or cyclical basis. Biological and physical resources include, but are not limited to, air, tidal and nontidal wetlands, ocean waters, estuaries, rivers, streams, lakes, aquifers, submerged aquatic vegetation, land, plants, trees, minerals, fish, shellfish, invertebrates, amphibians, birds, mammals, reptiles, and coastal resources of national significance. Coastal uses and resources also include uses and resources appropriately described in a management program. The following are issues that would likely be relevant in the review of federal consistency under GCMP’s enforceable policies including but not limited to: (1) Effects on air quality should be evaluated for both the construction phase and operational phase of the proposed development projects and activities covered under the EIS, including their effects on the coastal zone and GCMP’s enforceable policies.	See response above.

Contact Type	Name	Organization	Comment ID	Theme(s)	Comment	Response
Duplicate	Lola E. Leon Guerrero	Bureau of Statistics and Plans	56	CZMA	Appropriate best management practices (BMPs) should be included in plans reviewed by GCMP to minimize impacts to air quality in the coastal zone during both phases. (2) Effects to water quality should be evaluated for both the construction phase and operational phase of the proposed development projects and activities covered under the EIS, including their effects, on the coastal zone and GCMP's enforceable policies. Appropriate stormwater BMPs should be included in plans reviewed by GCMP to minimize impacts to water quality in the coastal zone in both phases. The proposed project sites are above the Northern Guam Lens Aquifer (NGLA), Guam's Sole Source Aquifer, and the source of about 85% of Guam's drinking water. Development above the NGLA has a reasonably foreseeable effect upon water quality, which should be addressed by appropriate permanent and temporary BMPs installed consistently with the CNMI and Guam Stormwater Management Manual. The beddown operations, and construction of the North Ramp Infrastructure Upgrades and the MSA-1 Upgrades describe actions that generate higher concentrations of hydrocarbons, trace metals, and other toxic chemicals. Storage and use of hazardous chemicals should be properly managed to prevent spills and should comply with Guam EPA's applicable regulations and permitting requirements in accordance with the Clean Water Act.	See response above.

Contact Type	Name	Organization	Comment ID	Theme(s)	Comment	Response
Duplicate	Lola E. Leon Guerrero	Bureau of Statistics and Plans	56	CZMA	Use of water and wastewater systems should comply with Guam Waterworks Authority's applicable regulations and permitting requirements. In addition, low impact development practices should be implemented. Some low impact development practices are identified in the Island Stormwater Practice Design Specifications, A Supplement to the 2006 CNMI & Guam Stormwater Design Manual. Effects to estuaries and reefs should also be considered and subject to strictly applied stormwater BMPs. (3) Direct and indirect impacts to fragile areas should be avoided, minimized, and mitigated appropriately, particularly historic and archaeological sites, wildlife habitats, pristine marine and terrestrial communities, limestone forests, and mangrove stands and other wetlands. Part of the protection of marine communities is managed through the marine preserves also known as the Marine Protected Areas. Destruction of habitats for endangered and threatened species should be avoided. Take of endangered or threatened species should not occur, with the implementation of appropriate measures to avoid intentional or inadvertent take. (4) Public access shall be ensured for beach areas, recreation areas, parks, scenic overlooks, conservation areas, other Government of Guam public lands and submerged lands. This also includes offshore uses such as fishing, including indigenous fishing, recreational water use, and traditional seafaring and related activities.	See response above.

Contact Type	Name	Organization	Comment ID	Theme(s)	Comment	Response
Duplicate	Lola E. Leon Guerrero	Bureau of Statistics and Plans	56	CZMA	(5) Impacts associated with hazards from aircraft carriers, air installations' crash and sound zones shall be evaluated in the EIS; and shall not pose unreasonable risks to the health, safety or welfare of the community and the environment. The foregoing should not be taken as an exhaustive list of considerations relevant to federal consistency with GCMP under the CZMA. In closing, I would like to encourage the U.S. Department of the Air Force to coordinate early and often with GCMP. Please do not hesitate to contact the GCMP Administrator, Mr. Edwin Reyes and or the Federal Consistency Planner, Ms. Esther Taitague by email at edwin.reyes@bsp.guam.gov or esther.taitague@bsp.guam.gov. Si Yu'os Ma'ase'. LOLA E. LEON GUERRERO	See response above.

Contact Type	Name	Organization	Comment ID	Theme(s)	Comment	Response
Local Agency	Ike Q. Peredo	Customs & Quarantine Agency	57a	Socioeconomics	Economic Impact Statement : Department of the Air Force F-15 beddown and infrastructure upgrades at AAFB With Guam outside the Customs Territory of the United States, the customs administration is carried out by the Government of Guam, further delegating these authorities and responsibilities to the Guam Customs & Quarantine Agency (CQA), carrying out customs controls and formalities at all ports of entry into the territory. CQA is charged with securing all of Guam's ports of entry, facilitating trade and commerce, performing inspections and clearances of all persons and conveyances arriving into Guam; preventing the spread of communicable diseases; interdiction of illicit contraband, terroristic implements and components; conduct criminal and administrative investigation related to customs violations and other centric border functions correlating with our collaboration with other local and federal agencies. As cooperator's for the U.S. Department of Agriculture's Animal Plant Inspection Service on Guam, CQA performs inspections and regulates the movement of agricultural commodities to prevent the introduction of invasive pests and animals or plant diseases. As of 2023, personnel resources include 142 Uniformed Officers and 18 Civilian Staff, executing customs border control missions and responsibilities at the Guam International Air Terminal, Air Cargo facility, Port Authority of Guam and marinas, Guam Main Facility, and on DoD installations in the U.S. Naval Station and Andersen Air Force Base (AAFB).	The Draft EIS will include the requested information and analysis on socioeconomic topics including construction workforce, and support personnel.

Contact Type	Name	Organization	Comment ID	Theme(s)	Comment	Response
Duplicate	Ike Q. Peredo	Customs & Quarantine Agency	57a	Socioeconomics	Customs service demands and personnel shortages at these locations is consistently an issue to optimize staffing and service these areas. To meet these goals and demands, the agency is pursuing recruitment to increase personnel and other allowable mechanisms to increase our operability at all our areas of responsibilities. The Department of the Air Force F-15 beddown and infrastructure upgrades at AAFB will increase demands for CQA services in our operations and roles we engage in protecting Guam's environment. The EIS should take in consideration any and all information directly related to the inspection of arriving passengers, crew, support personnel and freight in order for CQA to determine the requirements for its operations to meet the demands of increased activity at AAFB. Additionally, the information must also include the importation of equipment, tools, materials and contract skill labor force that will be used for the construction infrastructure upgrades anticipated in the harding or erecting of military facilities supporting the operation. This information is necessary in order for the agency to assess its operational needs at AAFB as well as at the GIAA and PAG.	See response above.

Contact Type	Name	Organization	Comment ID	Theme(s)	Comment	Response
Duplicate	Ike Q. Peredo	Customs & Quarantine Agency	57b	Other	The EIS should take in consideration the review of the current DoD Foreign Clearance Guide (FCG), specifically for customs clearances with CQA. Such a review is pertinent to the planned F-15 beddown and infrastructure upgrades at AAFB, as updating of the guide will memorialize CQA clearance processes, procedures and protocols necessary to prevent the introduction of pest, disease or other types of commodities detrimental to the environment.	Comment noted. Revisions to the DoD Foreign Clearance Guide are outside the scope of NEPA and the EIS. The DAF and partner nation forces at Andersen AFB will adhere to all applicable customs and clearance requirements. The Armed Forces Pest Management Board coordinates DoD activities to prevent and control the spread of invasive species, on, to, or from military bases. The DAF would require the construction contractor the implement a Hazard Analysis and Critical Control Point to ensure protocols are in place to prevent or minimize the introduction of diseases and invasive species to the project areas.

Contact Type	Name	Organization	Comment ID	Theme(s)	Comment	Response
Duplicate	Ike Q. Peredo	Customs & Quarantine Agency	57c	Biological Resources	The rate of introduction of invasive species in Guam has grown exponentially. One factor has been through their unintentional transport on military cargo and personnel transport, as well as on warships. The EIS should include any and all information pertaining to potential impacts from the introduction of invasive species due to the transportation of materials and conveyances in relation to the deployment and operation of the Republic of Singapore Air Force (RSAF) F-15 beddown and infrastructure upgrades at Andersen AFB. Additionally, the EIS should include the identification of resources, inclusive of funding, for assets and agreements for vigilance, mitigation, eradication, and management of invasive species as well as other threats. Invasive species have threatened native plants and animal populations that have been detrimental to the island's ecosystem. This has harmful consequences to Guam's traditional practices and food sources. The EIS should include an assessment of the potential for the transportation of invasive species and DoD's efforts to mitigate their introduction in Guam.	The Draft EIS will include the requested information and analysis on invasive species and the bio security measures that will be implemented at Andersen AFB to prevent their spread to the installation.
Duplicate	Ike Q. Peredo	Customs & Quarantine Agency	57d	Socioeconomics	To address the service demands of CQA during all phases the beddown and infrastructure upgrades will create, the EIS should include that DoD identify provisions permitting the inclusion into the budgets of military installations for reimbursement for CQA's services, such as those found in the Defense Transportation Regulations Part V-502-7 thru 9. Also to examine existing financial service programs in the government of Guam specifically for CQA services.	Comment noted. Military expenditures and funding of local agencies are outside the scope of NEPA and the EIS. The capacity of local agencies is an important topic that will be considered in the decision making process.

Contact Type	Name	Organization	Comment ID	Theme(s)	Comment	Response
Duplicate	Ike Q. Peredo	Customs & Quarantine Agency	57e	Other	EIS should also assess CQA's current processing and office space on AAFB, to determine its operability, capacity, functionality, serviceability and current mitigation measures for handling arrivals. This is necessary for proper containment, handling and prevention of commodities that serve as a means of conveyances of unwanted invasive species detrimental to the environment and fragile ecosystem. Finally, the Government of Guam would need additional support for the construction of its Customs Satellite Inspection Facility at the Port Authority of Guam. Once built, this facility will provide CQA with a controlled and sterile facility for inspections of imported commodities to include those that support the planned military activity within a location that can contain and minimize invasive species or diseases that will negatively impact the environment.	Comment noted. The funding of local agencies and local projects are outside the scope of NEPA and the EIS. The capacity of local agencies is an important topic that will be considered in the decision making process.

Contact Type	Name	Organization	Comment ID	Theme(s)	Comment	Response
Local Agency	Evangeline Lujan	Guam Waterworks Authority	58a	Infrastructure	The following are the comments from the Guam Waterworks Authority (GWA). The signed letter was mailed to ATTN: CEV (AAFB F-15 and Infrastructure EIS) Unit 14007 APO, AP 96543-4007 January 16, 2024 ATTN: CEV (AAFB F-15 and Infrastructure EIS) Unit 14007 APO, AP 96543-4007 Subject: Notice of Intent to Prepare an EIS and Conduct Public Scoping for Proposed F-15 Beddown and Infrastructure Upgrades at Andersen Air Force Base (AAFB), Guam Hafa Adai! Guam Waterworks Authority (GWA) appreciates the opportunity to provide comments in response to the Notice of Intent to prepare an Environmental Impact Statement (EIS) and conduct Public Scoping for Proposed F-15 Beddown and Infrastructure Upgrades at Andersen Air Force Base (AAFB), Guam. The following are GWA comments to be considered in your analysis of Guam's Water Resources in preparation of the Environmental Impact Statement (EIS) for the project: 1. The information provided in the Notice of Intent and the brief public information brochure provided does not provide sufficient information to have a suitable understanding of the impact to GWA's existing water and wastewater systems, or the impact to shared water resources of the Northern Guam Lens Aquifer (NGLA). Detail information on water and wastewater current and future demand will be required for the proposed project under consideration.	The Draft EIS will include information and analysis for the proposed water usage and source.

Contact Type	Name	Organization	Comment ID	Theme(s)	Comment	Response
Duplicate	Evangeline Lujan	Guam Waterworks Authority	58a	Infrastructure	2. The EIS should provide sufficient information on the likelihood or intent to connect to GWA water or wastewater services. Currently, GWA provides wastewater services to some Department of Defense (DOD) facilities including AAFB, and may have the ability to service the proposed facilities depending on projected flow rates. GWA currently accepts wastewater from Department of Defense facilities located in northern Guam via its collection system and treats it at the Northern District Wastewater Treatment Plant. Although GWA may have capacity at its current wastewater treatment facilities, upgrades to the existing collection lines, pump stations, etc. may be needed to accommodate the future demand. The EIS should include proposed alternative infrastructure routing (not through existing utility corridors) that may require new utility service. If wastewater from the improvements will be sent to GWA's wastewater facilities, ensure that detail information including project flow rates and sources of wastewater (restrooms, kitchens, industrial processes, washdowns, etc.) are included in the wastewater projections. 3. Eighty percent (80%) of Guam's drinking water comes from the Sole Source NGLA, this is a shared resource carefully managed by a team of technical experts, environmental regulators, and utility providers.	See response above.

Contact Type	Name	Organization	Comment ID	Theme(s)	Comment	Response
Duplicate	Evangeline Lujan	Guam Waterworks Authority	58a	Infrastructure	GWA has worked with the DOD, including AAFB as part of the One Guam Initiative, in an effort to improve water and wastewater service, to explore opportunities for inoperability between GWA and DOD infrastructure and to build resilient and reliable water and wastewater systems for the island. Continued support for this collaborative effort will ensure that the aquifer and surface water are properly managed. Impacts can be jointly managed under an appropriate mutual venue such as One Guam Water coordination. 4. The EIS should provide sufficient information on planned critical redundancies for the water requirements for the proposed activities. Local media has reported that there will be an increase of 240 support personnel and dependents stationed at AAFB and approximately 200 temporary support personnel twice a year. Please provide information on any additional facilitates that will be constructed to support the increase in populations that will be stationed at AAFB. Will the AAFB water wells be sufficient for existing and future water demand? If new water wells are proposed, detailed plans should be discussed with GWA as soon as possible. Will GWA be required to meet increase water demand for all the cumulative activities and/or redundant supply associated with the increase in military activities in Guam? Proposed interties and metering to GWA systems for water supplies for the proposed project should be adequately defined in the EIS.	See response above.

Contact Type	Name	Organization	Comment ID	Theme(s)	Comment	Response
Duplicate	Evangeline Lujan	Guam Waterworks Authority	58b	Water Resources	5. Water resources will need to be analyzed under this proposed EIS. It is difficult to fully understand the impact from the ongoing military buildup, specifically the impact to the aquifer from Camp Blaz and other ongoing military activity. Analysis on the cumulative impacts especially related to water withdrawal may be necessary to adequately assess the impact of overall remaining capacity of the NGLA from the increase in activities needed to support this project. DOD and GWA are working with USGS and with University of Guam's (UOG) Water and Environmental Research Institute (WERI) to monitor the health of the aquifer. The analysis must use the latest information collected from the newly expanded monitoring well system. Updated models used to determine sustainable yield must include climate change impacts including periodic draught that may cause reduction in water production.	Water resources will be fully analyzed in the Draft EIS. The Draft EIS also will include information and analysis regarding drinking water and climate change.

Contact Type	Name	Organization	Comment ID	Theme(s)	Comment	Response
Duplicate	Evangeline Lujan	Guam Waterworks Authority	58c	HazMat	6. Proposed infrastructure upgrades for parking, storing, maintaining, refueling, loading and unloading aircraft in addition to other support facilities may be located within Guam's EPA Groundwater Management Protection Zone. Please provide detailed information if new fuel lines, from "off base" are part of the proposed infrastructure upgrades. Certain activities may present a risk to groundwater quality and existing GWA production wells. The EIS should provide complete information on all chemicals and potential contaminants including oils, fuels, and other chemicals that may enter the NGLA due to the proposed activities. The EIS should provide sufficient detail on preventative measures to ensure that contaminants do not enter the groundwater. If wastewater from the proposed infrastructure upgrades and any industrial processes will be part of the waste stream, an Industrial Pretreatment Permit from GWA may be required. AAFB should consult with GWA's Source Control Manager for additional industrial wastewater pre-treatment requirements including flow diagrams and material safety data sheets. 7. If GWA's wastewater service will be used, stormwater is prohibited from being discharged into GWA's wastewater systems. The EIS should consider that separate stormwater systems are required and should be adequately sized to prevent illicit discharges into GWA's wastewater system. Runoff from proposed washdown areas must not enter GWA's wastewater system.	The Draft EIS will include the information and analysis requested regarding fuels infrastructure, stormwater runoff, and associated preventative measures.

Contact Type	Name	Organization	Comment ID	Theme(s)	Comment	Response
Duplicate	Evangeline Lujan	Guam Waterworks Authority	58c	HazMat	Thank you for the opportunity to provide comments, additional studies for utilities and infrastructure for potable water and wastewater for current and future capacity demands should be discussed with GWA at the earliest convenience. Sincerely, /s? Miguel C. Bordallo, P. E. General Manager cc: Thomas Cruz, P.E., AGM Operations Paul Kemp, M.S., AGM Compliance and Safety Jeanet Babauta, P.E., AGM Engineering Prudencio Aguon, Grants Administrator, Planning	See response above.
Public	Jessica	N/A	59	Not Substantive	No thanks we don't want anymore war machines on our island we've had enough. War remnants continue to contaminate our lands and resources we demand clean up. The us military continues to have ill affects on our resources our people and our social wellbeing as a whole. We're done being complicit and participate in your wars and ways. The us militarization in the Mariana islands is a plague.	Comment noted.

Contact Type	Name	Organization	Comment ID	Theme(s)	Comment	Response
Federal Agency	Karen Vitulano	U.S. Environmental Protection Agency, Region 9 Environmental Review Branch, Tribal, Intergovernmental and Policy Division	60		Hi David – Quick question about the supplemental scoping you are doing for the Andersen AFB Infrastructure upgrades and F-15 Beddown – the scoping materials don't indicate, but will you be needing to construct additional housing at AAFB? The scoping materials only say an increase in 240 support personnel and dependents stationed at Andersen AFB, Guam, but its not clear if there is sufficient space already there or if the project includes construction of new housing/support facilities at AAFB.	No new housing would be built on Andersen AFB as part of the Proposed Action. Personnel and dependents would utilize off base housing within the local community. Information and analysis will be included in the Draft EIS under the socioeconomics resource area.
Federal Agency	Karen Vitulano	U.S. Environmental Protection Agency, Region 9 Environmental Review Branch, Tribal, Intergovernmental and Policy Division	61a	Other	Subject: Scoping comments for the F-15 Beddown and Infrastructure Upgrades at Andersen Air Force Base, Guam Dear David Martin: The U.S. Environmental Protection Agency has reviewed the Notice of Intent (NOI) published on December 15, 2023 regarding the Department of the Air Force's decision to reopen the scoping period due to an expansion of the project previously scoped in 2021, specifically to include the beddown of 12 Republic of Singapore Air Force F–15 fighter aircraft, in addition to the proposed infrastructure upgrades at Andersen Air Force Base. We are attaching our scoping comments from 2021 on the infrastructure upgrades and our additional suggestions, primarily regarding the F-35 beddown component, are below. Our comments are provided pursuant to the National Environmental Policy Act, Council on Environmental Quality regulations (40 CFR Parts 1500-1508) and our NEPA review authority under Section 309 of the Clean Air Act.	The ground disturbance near the MSA-1 project area is part of a separate USMC action to construct 48 new Hayman-style earth covered magazines in MSA-1 at Andersen AFB. The Draft EIS will identify the present and reasonably foreseeable actions near the project areas and include an analysis of cumulative impacts.

Contact Type	Name	Organization	Comment ID	Theme(s)	Comment	Response
Duplicate	Karen Vitulano	U.S. Environmental Protection Agency, Region 9 Environmental Review Branch, Tribal, Intergovernmental and Policy Division	61a	Other	In addition to the attached 2021 EPA scoping comments, we have the following suggestions for your consideration when preparing the Draft Environmental Impact Statement (DEIS): <u>MSA-1 Upgrades</u> It appears land disturbance is already occuring to the south of C Avenue between 8th and 10th Streets. Scoping materials show the proposed location for MSA-1 upgrades to the north of C Avenue between 8th and 10th Streets. Indicate in the DEIS if this is disturbance is for the MSA-1 in a modified location, or if it is for another project. We recommend the Air Force minimize unnecessary land disturbance and ensure project actions do not occur until a Record of Decision or other decision document is signed.	See response above.
Duplicate	Karen Vitulano	U.S. Environmental Protection Agency, Region 9 Environmental Review Branch, Tribal, Intergovernmental and Policy Division	61b	HazMat	<u>North Ramp Upgrades</u> Please note our attached 2021 scoping comment regarding bulk fuel storage and distribution. In addition to a spill prevention, control and countermeasure (SPCC) plan, as indicated, a Facility Response Plan (FRP) will also likely be required. Please consult with Pete Reich in the EPA Region 9 Oil Program for technical guidance and compliance assistance as the project moves forward. Pete can be reached at 415-972-3052 or 415-961-4376 (cell) or by email at Reich.peter@epa.gov.	The Draft EIS will include the requested information on the proposed fuel systems and will identify the design and operations requirements that will be implemented for pipeline integrity and safety. The DAF would follow all requirements outlined in Andersen AFB's SPCC and Facility Response Plans and would develop and adhere to the provisions contained in a site-specific SPCC Plan.

Contact Type	Name	Organization	Comment ID	Theme(s)	Comment	Response
Duplicate	Karen Vitulano	U.S. Environmental Protection Agency, Region 9 Environmental Review Branch, Tribal, Intergovernmental and Policy Division	61c	Socioeconomics	F-15 Beddown *Facilities for support personnel and population increase* The scoping materials indicate that the project requires an additional 240 support personnel and dependents, with the further addition of 200 temporary personnel during training missions for 8 weeks per year. We understand that no new housing or facilities are proposed for this project and that personnel with dependents would utilize off base housing within the local community, which would be analyzed in the EIS under socioeconomic impacts.[1] [1] Email correspondence Karen Vitulano EPA and David Martin, Air Force, 1/3/24	The Draft EIS will include full analysis of the socioeconomic impacts from the Proposed Action.

Contact Type	Name	Organization	Comment ID	Theme(s)	Comment	Response
Duplicate	Karen Vitulano	U.S. Environmental Protection Agency, Region 9 Environmental Review Branch, Tribal, Intergovernmental and Policy Division	61d	Cumulative	While the increase in personnel is relatively minor, it would occur in the context of many other military projects which would increase the presence of both the military and nonmilitary workforce on the island, including the Guam missile defense planning that could include an additional population of up to 4,000 servicemembers, dependents, civilians, and contractors, and the population associated with Camp Blaz. The socioeconomic impact assessment should address all related impacts including impacts to the housing market,[2] local job markets, workloads and staffing of Guam EPA and other local government agencies. Efforts to mitigate socioeconomic effects should be identified, such as engaging local small businesses, assistance to local government to address increased workload and capacity, etc. The additive impacts to utility systems including water and wastewater, and power demand should be identified. Consistent with E.O. 14057 - Catalyzing Clean Energy Industries and Jobs Through Federal Sustainability, we recommend the project seek opportunities to use real property assets, such as rooftops, parking structures, and adjoining land to integrate carbon pollution-free electricity generation and energy storage capacity components into the project, which would help offset increased power demand from the project.	The socioeconomics section of the Draft EIS will include the requested information and analysis on local socioeconomic conditions.

Contact Type	Name	Organization	Comment ID	Theme(s)	Comment	Response
Duplicate	Karen Vitulano	U.S. Environmental Protection Agency, Region 9 Environmental Review Branch, Tribal, Intergovernmental and Policy Division	61d	Cumulative	[2] According to the Guam Economic Development Authority, the median home price increased from $245,000 from before the military realignment from Okinawa to Guam, to $430,000 in mid-2023. https://www.postguam.com/news/local/geda-missile-defense-raises-concerns-for-housing-employment-and-inequality/article_13326a00-4318-11ee-98b2-2310baea6a28.html	See response above.
Duplicate	Karen Vitulano	U.S. Environmental Protection Agency, Region 9 Environmental Review Branch, Tribal, Intergovernmental and Policy Division	61e	Water Resources	*Groundwater quality* In addition to additive impacts to the drinking water system utility, address the added demand and stressors on the Northern Guam Lens Aquifer, a Safe Drinking Water Act designated Sole Source Aquifer. This aquifer is a sensitive and irreplaceable source of drinking water for Guam. Address risk to water quality, PFAS contamination, and how the addition of 12 F-15's could increase the use of aqueous fire fighting foam at AAFB.	The Draft EIS will include the requested information and analysis on utilities, including potable water, and potential for aquifer water quality.
Duplicate	Karen Vitulano	U.S. Environmental Protection Agency, Region 9 Environmental Review Branch, Tribal, Intergovernmental and Policy Division	61f	Noise	*Training Impacts – Noise* The addition of 12 F-15 aircraft will contribute to noise impacts during training operations, and during the planned exercises that, according to the scoping materials, will occur twice a year for 4-weeks each. The DEIS should evaluate the increases in noise from the F-15 operations and planned exercises. When presenting noise contour maps, ensure it is clear to the reader whether noise from actions planned but that have yet occurred are included in the baseline contours.	The Draft EIS will include the requested noise information, including noise modeling results and analysis for the potential impacts on noise from the Proposed Action. Both the Annual Average Busy Day DNL contours (i.e., "exercise contours") will be included in the Draft EIS.

Contact Type	Name	Organization	Comment ID	Theme(s)	Comment	Response
Duplicate	Karen Vitulano	U.S. Environmental Protection Agency, Region 9 Environmental Review Branch, Tribal, Intergovernmental and Policy Division	61f	Noise	Impact Assessment Methodology: The noise impact assessment should be comprehensive and communicate noise impacts to the public in a manner that comports with their lived experience. We strongly recommend against the tactic used in the Revised Divert Activities EIS that similarly proposed 8 weeks of training. That EIS averaged the increased noise levels during the 8 weeks of training with 10 months of relative quiet to produce an average annual noise level that was much lower than what would be experienced by the public, and thus misrepresented project noise impacts. We recommend including metrics in addition to the averaging metric Day-Night Average Sound Level (DNL) when determining significance for noise impacts in the DEIS. Even if DNL is used more appropriately, such as for the Average Busy Day or for the 8 weeks per year of actual training exercises, it has limitations. The Government Accountability Office found that providing information on potential noise impacts grounded in DNL was not clear enough for communities to understand planned changes.[3]	See response above.

Contact Type	Name	Organization	Comment ID	Theme(s)	Comment	Response
Duplicate	Karen Vitulano	U.S. Environmental Protection Agency, Region 9 Environmental Review Branch, Tribal, Intergovernmental and Policy Division	61f	Noise	In addition to the noise metrics chosen, we recommend presenting the change in noise level over the existing condition in the DEIS. Interpret this change in level for the reader, such as indicating that a 3 dB increase in noise is characterized as "a large change" in the level of noise exposure when the existing condition is below 65 dB, and that this increase can be perceived by people as a degradation of their noise environment. Also disclose that because decibels are on a logarithmic scale, an increase of 10 dBs is experienced as a subjective doubling of loudness.[4]	The change in sound levels from F-15 beddown will be included in the Draft EIS as before-and-after DNL contours on the same figure, and sound levels from individual aircraft overflights both with and without the Proposed Action. The interpretations relating to a 3 dBA and 10 dBA changes in level are not applicable to the DNL sound metric and will not be included.
Duplicate	Karen Vitulano	U.S. Environmental Protection Agency, Region 9 Environmental Review Branch, Tribal, Intergovernmental and Policy Division	61f	Noise	Incorporate recent information regarding annoyance levels obtained from FAA's Neighborhood Environmental Survey.	The DAF and other federal agencies, including the FAA, use the FICON dose-response curve (i.e., the modified Shultz Curve) and the 65 dBA DNL metric to assess the effects of noise for land use planning purposes; therefore, annoyance levels obtained from FAA's Neighborhood Environmental Survey will not be included in the Draft EIS.
Duplicate	Karen Vitulano	U.S. Environmental Protection Agency, Region 9 Environmental Review Branch, Tribal, Intergovernmental and Policy Division	61f	Noise	If flying procedures to reduce noise are incorporated into noise modeling, clearly disclose this, indicate how much noise reduction in the output is a result of these adjustments, and ensure the flying procedures used in the model are implemented via specifying in the project description or as committed mitigation measures.	No specific flying procedures to reduce noise are required or will be implemented; therefore, none will be incorporated into the noise modeling.

Contact Type	Name	Organization	Comment ID	Theme(s)	Comment	Response
Duplicate	Karen Vitulano	U.S. Environmental Protection Agency, Region 9 Environmental Review Branch, Tribal, Intergovernmental and Policy Division	61f	Noise	When supplying updated noise contours that would occur under the project, include the number of individuals that would experience each noise contour area, and not just the acreage that would experience the change.	The acreage, number of residences based on aerial counts, and number of individuals based on census data within the 65 dBA DNL noise contour both with and without the Proposed Action will be included in the EIS.
Duplicate	Karen Vitulano	U.S. Environmental Protection Agency, Region 9 Environmental Review Branch, Tribal, Intergovernmental and Policy Division	61f	Noise	If the noise impact assessment predicts levels at 80 DNL or above, assess the potential for hearing loss, consistent with DoD policy.	A discussion of hearing loss will be included in the EIS.

Contact Type	Name	Organization	Comment ID	Theme(s)	Comment	Response
Duplicate	Karen Vitulano	U.S. Environmental Protection Agency, Region 9 Environmental Review Branch, Tribal, Intergovernmental and Policy Division	61f	Noise	<u>Use of Supplemental Metrics, especially Sleep Interference</u> Communicating noise impacts using supplemental noise metrics such as speech interference and sleep disturbance improves public understanding of noise exposure and decision makers' ability to make better informed decisions (DoD Technical Bulletin Using Supplemental Noise Metrics and Analysis Tools, 2009). Noise-induced sleep disturbance is considered the most deleterious non-auditory effect of environmental noise exposure.[5] We recommend the DEIS include supplemental metrics, including sleep disturbance if training will occur at night. [3] See https://www.gao.gov/assets/gao-22-105844.pdf [4] Federal Interagency Committee on Noise (FICON), August 1992. Federal Agency Review of Selected Airport Noise Analysis Issues. p. 3-5. Available: https://fican1.files.wordpress.com/2015/10/reports_noise_analysis.pdf [5] Aviation Noise Impacts: State of the Science. Available: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5437751/?report=printable	Supplemental noise metrics will be included in the EIS to assess the effect of aircraft noise on both sleep and speech, and specifically the potential for speech interference in nearby schools.

Contact Type	Name	Organization	Comment ID	Theme(s)	Comment	Response
Duplicate	Karen Vitulano	U.S. Environmental Protection Agency, Region 9 Environmental Review Branch, Tribal, Intergovernmental and Policy Division	61g	EJ	Noise Impacts on Communities with Environmental Justice Concerns Consistent with Executive Order 12898 - Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (February 16, 1994), Executive Order 13985 - Advancing Racial Equity and Support for Underserved Communities Through the Federal Government (January 20, 2021) and others, the DEIS should identify minority and low-income census block groups among the population that would experience increased noise impacts and indicate whether these would disproportionately affect low income or minority populations. In the EJ analysis, identify how populations with EJ concerns may be more vulnerable to noise impacts. Identify the specific outreach that was conducted for these populations, including efforts to address non-English speaking residents such as providing information in Chamorro and/or Carolinian, and what efforts were done to accommodate the public and address barriers to participation. Clear communication of noise impacts that comports with lived experience is essential (see Impact Assessment Methodology comment above).	The Draft EIS will include the requested information and analysis regarding environmental justice populations, schools, and related noise impacts, The EIS will identify the regulations that will be followed and the permit requirements that will be implemented as part of the project.

Contact Type	Name	Organization	Comment ID	Theme(s)	Comment	Response
Duplicate	Karen Vitulano	U.S. Environmental Protection Agency, Region 9 Environmental Review Branch, Tribal, Intergovernmental and Policy Division	61g	EJ	<u>Noise Impacts to Children's Learning</u> The DEIS should acknowledge Executive Order 13045, Protection of Children from Environmental Health Risks and Safety Risks and disclose that children are vulnerable populations that may suffer more disproportionately from environmental health and safety risks than adults. Short-term exposure to elevated environmental noise can interfere with classroom learning due to increased difficulty in speech intelligibility, and long-term exposure has been correlated to decreased reading comprehension and reduced learning motivation. According to the National Academy of Sciences and the Transportation Research Board, reading, motivation, language and speech, and memory are affected by elevated noise.[6] These represent acoustical barriers to learning, especially for young children since they are more susceptible than adults to the effects of background noise on spoken communication. The DEIS should identify all schools and daycare centers that could be impacted by noise increases and identify the noise levels from the proposed action and alternatives predicted to classroom interiors, which considers the most common local building construction materials for sound level attenuation and modeled to estimate interior noise levels with windows open and closed.	See response above.

Contact Type	Name	Organization	Comment ID	Theme(s)	Comment	Response
Duplicate	Karen Vitulano	U.S. Environmental Protection Agency, Region 9 Environmental Review Branch, Tribal, Intergovernmental and Policy Division	61g	EJ	Discuss these predicted noise levels in the context of the American National Standards Institute (ANSI) standard (ANSI S12.60-2002, Acoustical Performance Criteria, Design Requirements, and Guidelines for Schools). The guidelines are keyed to the acoustical qualities needed to achieve a high degree of speech intelligibility in learning spaces. The standard recommends that core learning spaces having enclosed volumes not greater than 20,000 cubic feet not be exposed to greater than 40 dB of A-weighted unsteady background noise from transportation noise sources for more than 10% of the noisiest hour; for core learning spaces having enclosed volumes greater than 20,000 cubic feet, this level of exposure should not exceed 45 dB for more than 10% of the noisiest hour. Discuss potential mitigation for schools and daycare centers, including no fly zones over schools. All reasonable mitigation measures should be identified, including a discussion of retrofitting impacted schools with appropriate measures such as adding insulation, adding a second windowpane 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. Identify mitigation for off-base schools now available through DoD's Community Noise Mitigation program. 6 http://onlinepubs.trb.org/onlinepubs/acrp/acrp_webdoc_034EducatorsHandbook.pdf	See response above.

Contact Type	Name	Organization	Comment ID	Theme(s)	Comment	Response
Duplicate	Karen Vitulano	U.S. Environmental Protection Agency, Region 9 Environmental Review Branch, Tribal, Intergovernmental and Policy Division	61h	Cumulative	<u>Cumulative effects</u> The cumulative effects analysis is important considering the number of military projects and construction occurring and being planned for Guam. Identify how resources, ecosystems and human communities of concern have already been affected by past or present activities in the project areas. Characterize these resources in terms of their response to change and capacity to withstand stressors. Trends data should be used to establish a baseline for the affected resources, to evaluate the significance of historical degradation, and to predict the environmental effects of the project components. While all resource areas should consider the cumulative impacts that have already occurred or are occurring, we highlight the iterative loss of primary and secondary limestone forest at AAFB and the island and the effects of this on wildlife species. Detailed discussion is also recommended for the cumulative effects of all military projects to the Northern Guam Lens Aquifer. Cumulative impacts to historical and cultural resources should discuss the large impacts from the construction of Camp Blaz. Cumulative socioeconomic effects and effects on utilities and on GovGuam's and other public services should be discussed. Potential mitigation for cumulative effects is appropriate, especially for areas where DoD's past contributions were significant.	The Draft EIS will include the requested information and analysis of present and reasonably foreseeable projects and the associated cumulative impacts.

Contact Type	Name	Organization	Comment ID	Theme(s)	Comment	Response
Duplicate	Karen Vitulano	U.S. Environmental Protection Agency, Region 9 Environmental Review Branch, Tribal, Intergovernmental and Policy Division	61i	Not substantive	The EPA appreciates the opportunity to comment on preparation of this DEIS. When the DEIS is released for public review, please send an electronic copy to me at vitulano.karen@epa.gov. If you have questions, please contact me at (415) 947-4178 or by email.	Comment noted.

Contact Type	Name	Organization	Comment ID	Theme(s)	Comment	Response
Federal Agency	Jacqueline Flores	USFWS	62a	Biological Resources	Subject: Scoping Comments for F-15 Beddown and Infrastructure Upgrades at Andersen Air Force Base, Guam Dear 36th Civil Engineer Squadron: We provide the following information for your use preparing scoping comments on the proposed beddown and support of 12 Republic of Singapore Air Force (RSAF) F–15 fighter aircraft, and construction of infrastructure upgrades at Andersen Air Force Base, Guam (Figure 1). The project is led by the U.S. Department of the Air Force (DAF), and the U.S. Department of the Navy is a cooperating agency. We have been coordinating, pursuant to the Endangered Species Act (ESA) of 1973 [16 U.S.C. 1531-1544 et seq.], as amended, with these Department of Defense agencies regarding this project. The project would entail an increase in annual airfield operations, increase in personnel, and new infrastructure upgrades adjacent to the northwest corner of the airfield and within the munitions storage area at Andersen Air Force Base. Construction would take place over approximately 3 to 7 years and would include airfield pavements, an aircraft hangar, maintenance and utilities buildings, fuel systems, fencing and utilities, roadways and parking, stormwater management infrastructure, and earth covered magazines. Approximately 209 total acres (85 hectares) would be needed for construction.	The Draft EIS will include the requested information and analysis regarding biological resources including vegetation and wildlife and associated impacts. The Draft EIS also will include the results of biological surveys conducted in 2024 to assess the biological conditions of the project areas following Typhoon Mawar. The DAF is conducting ESA Section 7 consultation with USFWS. A summary of the Biological Opinion and a list of all required mitigation measures will be included in the EIS once consultation is complete. All existing plans and procedures for the management of natural resources, such as the Integrated Natural Resources Management Plan and USFWS recovery plans, will be followed during construction and operation of the Proposed Action.

Contact Type	Name	Organization	Comment ID	Theme(s)	Comment	Response
Federal Agency	Jacqueline Flores	USFWS	62a	Biological Resources	We recommend the project sites be selected and the components be situated and operated in a manner that minimizes disturbance to Guam's native plant and animal species and their habitats, including designated critical habitat. We further recommend any unavoidable impacts to threatened and endangered species or their habitat be offset with native plant and animal conservation projects such that the baseline status of the species is not reduced as a result of the project. We recommend the project avoid disturbing any native limestone forest by restricting all construction to previously developed areas and areas that have been converted by disturbance to non-native or grassy vegetation. Assess the effects of the project that may occur from construction, maintenance, and operational use of the proposed facilities. Off-site conservation actions should be developed and conducted prior to project construction, to ensure the status of threatened and endangered species is not, even temporarily, reduced as a result of the project. We recommend you incorporate the enclosed January 10, 2024, DRAFT U.S. Fish and Wildlife Service Recommended Measures to Minimize Potential Project Impacts to Threatened and Endangered Species and Critical Habitats in the Mariana Islands into the project's planning and development.	See response above.

Contact Type	Name	Organization	Comment ID	Theme(s)	Comment	Response
Federal Agency	Jacqueline Flores	USFWS	62a	Biological Resources	Below we provide refined noise and nighttime lighting recommendations specific to this type of project activity. Please thoroughly address and offset any unavoidable impacts of project-related sound and nighttime light disturbance to Guam's native wildlife and please ensure the project does not result in movement of invasive species. Project-Specific Noise: Map areas where project-related sound greater than 60 dB (audible (dBA) and low-frequency (0.5-20 Hz)) may occur. Specify sound intensity zones and detail the timing and duration different areas of the landscape may be exposed to project-related sound. Adjust the project to avoid exposing native wildlife to project-related sound. Where project sound may unavoidably impact native wildlife, detail the manner in which it may adversely affect native wildlife. Ensure the project incorporates conservation actions that offset project impacts to all native wildlife species such that the status of native species in Guam is not reduced as a result of the proposed action.	See response above.

Contact Type	Name	Organization	Comment ID	Theme(s)	Comment	Response
Federal Agency	Jacqueline Flores	USFWS	62b	Biological Resources	Minimize nighttime light disturbance to listed species and their habitat: Minimize nighttime lighting in forested and beach areas. Direct temporary lighting away from forest habitat. When installing new or replacing existing permanent lights, use downward-facing, full cut-off lens lights (with the lowest lumens necessary). Fully shield all outdoor lights so the bulb can only be seen from below bulb height and only use when necessary. Install automatic motion sensor switches and controls on all outdoor lights or turn off lights when human activity is not occurring in the lighted area. When activities must be conducted in forested areas where Mariana fruit bats may be roosting or foraging, use red light filtered flashlights and headlamps.	The Draft EIS will include the requested information and analysis of the impacts on listed species from nighttime light disturbance. The Draft EIS will identify all management measures to reduce such impacts.
Federal Agency	Jacqueline Flores	USFWS	62c	Biological Resources	Invasive Species: Develop and incorporate strict biosecurity protocols including aircraft sanitation and inspections to ensure project-related aircraft do not introduce pests to Guam or move the brown treesnake or other pests from Guam to other areas occupied by native wildlife. Thank you for your ongoing coordination with us regarding this project. If you have any questions concerning these recommendations, please contact me at jacqueline_flores@fws.gov.	The Draft EIS will include the requested information on bio security measures. The Armed Forces Pest Management Board coordinates DoD activities to prevent and control the spread of invasive species, on, to, or from military bases. The DAF would require the construction contractor the implement a Hazard Analysis and Critical Control Point to ensure protocols are in place to prevent or minimize the introduction of invasive species to the project areas.

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APPENDICES

Appendix B: Biological Resources Analysis Supporting Documentation

ENVIRONMENTAL IMPACT STATEMENT for
F-15 BEDDOWN and INFRASTRUCTURE UPGRADES
at ANDERSEN AIR FORCE BASE, GUAM

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Appendix B: Biological Resources Analysis Supporting Documentation

B-1. Endangered Species Act Section 7 Consultation Summary

Table B-1 provides a summary of Section 7 consultation.

Table B-1. Summary of Consultation Actions with U.S. Fish and Wildlife Services under Section 7 of the Endangered Species Act

Date	Consultation Action
4/20/2021	The DAF issued a Notice of Intent (Vol. 86, No. 74 Federal Register, 20487, April 20, 2021) to prepare an *EIS for Infrastructure Upgrades at Andersen AFB*.
7/6/2021 through 9/17/2021	The DAF completed a biological resources survey from July 6 through September 17, 2021 (ChST), within the MSA-1 and North Ramp construction footprints to support the initial *EIS for Infrastructure Upgrades at Andersen AFB.*
12/4/2023	The DAF submitted a meeting request for early coordination for anticipated formal Section 7 consultation to the USFWS Pacific Islands Fish and Wildlife Office.
12/14/2023	The USFWS, DAF, and JRM held an initial coordination meeting and discussed the project overview, natural resources survey plan, formal consultation process, and species to be addressed in the Biological Assessment.
12/15/2023	The DAF issued a Notice of Intent (Vol. 88, No. 240 Federal Register 27166, December 15, 2023) to prepare an *EIS for F-15 Beddown and Infrastructure Upgrades at Andersen AFB*.
12/18/2023 through 3/21/2024	The DAF completed a biological resources survey from December 18, 2023, through March 21, 2024 (ChST), within the MSA-1 and North Ramp construction footprints, to confirm the presence of federally listed plants and assess general health following Typhoon Mawar in May 2023.
3/13/2024	The USFWS, DAF, and JRM attended an in-person coordination meeting on Oahu to provide a high-level review of the key points in the draft Biological Assessment and gather USFWS input.
4/19/2024	The DAF submitted the draft Biological Assessment to USFWS.

Key: AFB = Air Force Base; ChST = Chamorro Standard Time; DAF = Department of the Air Force; EIS = Environmental Impact Statement; JRM = Joint Region Marianas; MSA-1 = Munitions Storage Area 1; USFWS = U.S. Fish and Wildlife Service

B-2. Biological Resources Reports

Biological Survey Reports, and the Biological Assessment prepared pursuant to Section 7 of the Endangered Species Act (16 United States Code 1536[c]) in support of the Environmental Impact Statement (EIS) have not been included to reduce the encyclopedic nature of the EIS. All reports have been included in the Administrative Record for the EIS and can be provided upon request.

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APPENDICES
Appendix C: Cultural Resources Analysis Supporting Documentation

ENVIRONMENTAL IMPACT STATEMENT for
F-15 BEDDOWN and INFRASTRUCTURE UPGRADES
at ANDERSEN AIR FORCE BASE, GUAM

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Appendix C: Cultural Resources Analysis Supporting Documentation

C-1. National Historic Preservation Act Section 106 Compliance Summary

Table C- 1 provides a summary of compliance actions coordinated with the Guam State Historic Preservation Officer.

Table C- 1. Summary of Compliance Actions with the Guam State Historic Preservation Officer under Section 106 of the National Historic Preservation Act

Date	Compliance Action
5/20/2020	The DAF held an initial Section 106 coordination meeting with the Guam SHPO to discuss the Proposed Action, discuss previous surveys that may be relevant to the Proposed Action, and identify an approach for additional survey efforts within the MSA-1 and North Ramp project areas.
2/2/2021	The DAF held a Section 106 coordination meeting with the Guam SHPO to discuss the survey approach and Work Plan.
3/22/2021	The DAF submitted a formal request to initiate consultation with the Guam SHPO under Section 106 of the National Historic Preservation Act.
4/20/2021	The DAF issued a Notice of Intent (Vol. 86, No. 74, *Federal Register*, 20487, April 20, 2021) to prepare an *EIS for Infrastructure Upgrades at Andersen AFB*.
4/20/2021	The DAF submitted the *Work Plan for the Archaeological Investigations of the Proposed Infrastructure Upgrades at Andersen Air Force Base, Guam* to the Guam SHPO for review.
5/7/2021	The Guam SHPO submitted comments on the Proposed Action and the Work Plan during the initial scoping period.
6/2/2021	The DAF responded to comments received from the Guam SHPO and submitted a revised *Final Work Plan for the Archaeological Investigations of the Proposed Infrastructure Upgrades at Andersen Air Force Base, Guam*.
5/8/2021 through 6/8/2021	The DAF completed an archaeological investigation from May 8 through June 8, 2021 (ChST), within the MSA-1 and North Ramp project areas, to support the initial *EIS for Infrastructure Upgrades at Andersen AFB.*
10/21/2021	The DAF submitted the *Draft – Final Archaeological Investigations Report of the Proposed Infrastructure Upgrades at the North Ramp and MSA_1 Areas, Andersen Air Force Base, Guam, Mariana Islands* to the Guam SHPO for review and comment. The DAF also requested concurrence with the preliminary NRHP eligibility determinations for historic properties within the APE.
11/23/2021	The Guam SHPO provided a response to the preliminary NRHP eligibility determinations and comments regarding the Draft Archaeological Investigations Report.
12/1/2021	The DAF held a meeting with the Guam SHPO to discuss comments received on the *Draft Final Archaeological Investigations Report* and the preliminary NRHP eligibility determinations. The Guam SHPO recommended submitting eligibility determinations to the Keeper of the NRHP.

Date	Compliance Action
7/26/2022	The DAF submitted the *National Register of Historic Places Eligibility Determination Request for 13 Archaeological Sites associated with Archaeological Investigations of Proposed Infrastructure Upgrades at Andersen Air Force Base, Guam, Mariana Islands* to the Keeper of the NRHP. The DAF issued a courtesy notice to the Guam SHPO of submission of the eligibility determination request to the Keeper of the NRHP.
8/3/2022	The DAF submitted the *Final Archaeological Investigations Report of the Proposed Infrastructure Upgrades at the North Ramp and MSA-1 Areas, Andersen Air Force Base, Guam, Mariana Islands* to the Guam SHPO.
8/26/2022	The Guam SHPO submitted a response to the DAF's courtesy notice that was sent to notify the Guam SHPO of submission of the eligibility determination request to the Keeper of the NRHP.
9/14/22	The Keeper of the NRHP provided final determinations of eligibility on 11 of 13 sites submitted in July for its determination, 2 sites had insufficient data for final determinations.
10/27/2022	The DAF submitted a meeting request to the Guam SHPO to discuss the preliminary NRHP eligibility determinations in the request sent to the Keeper of the NRHP.
5/2/2024	JRM submitted a letter to SHPO confirming that archaeological Work Plans would be submitted under Stipulation VII.B.1(a)and VII.B.1(b)of the 2008 Programmatic Agreement.
5/13/2024	The Guam SHPO confirmed receipt of the letter documenting the future submittal of the Work Plans under Stipulation VII.B.1(a)and VII.B.1(b)of the 2008 Programmatic Agreement.

Key: AFB = Air Force Base; APE = Area of Potential Effect; DAF = Department of the Air Force; EIS = Environmental Impact Statement; MSA-1 = Munitions Storage Area 1; NRHP = National Register of Historic Places; SHPO = State Historic Preservation Officer

C-2. Cultural Resources Reports

The Final Archaeological Investigations Report prepared pursuant to Section 106 of the National Historic Preservation Act (36 Code of Federal Regulations Part 800, Subpart B) in support of the Environmental Impact Statement (EIS) has not been included to reduce the encyclopedic nature of the EIS. All reports have been included in the Administrative Record for the EIS and can be provided upon request.

APPENDICES
Appendix D: Coastal Zone Management Act Negative Determination

ENVIRONMENTAL IMPACT STATEMENT for
F-15 BEDDOWN and INFRASTRUCTURE UPGRADES
at ANDERSEN AIR FORCE BASE, GUAM

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Appendix D: Coastal Zone Management Act Compliance

[[Preparer's Note: A signed copy of the CZMA Negative Determination will be included in this Appendix prior to distribution of the Draft EIS.]]

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DEPARTMENT OF THE AIR FORCE
PACIFIC AIR FORCES

Colonel Ethan A. Rutell, USAF
Chief, Futures Division
25 E. St, Suite B-210
JBPHH, HI, 96853

Ms. Lola L. Guerrero, Director
Guam Coastal Management Program
Bureau of Statistics and Plans
P.O. Box 2950
Hagåtña, Guam 96932

Subject: Negative Determination for the Proposed F-15 Beddown and Infrastructure Upgrades at Andersen Air Force Base (AFB), Guam

Dear Ms. Guerrero,

The Department of the Air Force (DAF) proposes to construct facilities and have up to 12 Republic of Singapore Air Force F-15 fighter aircraft operate at Andersen AFB, Guam. The use of these facilities will be consistent with the types of operations currently occurring on the installation. The DAF determined that the proposed federal activity is a development project outside of Guam's defined coastal zone. This letter provides documentation that the DAF has determined that the proposed activity would not have foreseeable coastal effects to Guam's defined coastal zone per 15 CFR 930, Section 930.35.

The aircraft are anticipated to start flying operations in 2029 which includes takeoffs and landings to and from training areas over the ocean. Andersen AFB will also host additional aircraft periodically in support of training mission requirements. The aircraft beddown will include an increase in 240 personnel, on a permanent basis, and an additional 200 personnel on a temporary basis for occasional events.

Infrastructure upgrades will be adjacent to the northwest corner of the main airfield and within Munitions Storage Area-1. Upgrades to the infrastructure incorporate airfield pavements, hangar, flightline maintenance facility, utility buildings, jet fuel systems and storage, fencing, utility extensions, roadways, parking, stormwater management infrastructure, and earth-covered munitions storage structures. Construction will begin in 2025 and take place over three to seven years. Approximately 209 acres on Andersen AFB will be disturbed during construction, which will either result in developed land or will be returned to maintained vegetation areas.

The purpose of the proposed action is to provide critical infrastructure that enhances U.S. posture west of the International Date Line. Additionally, the proposed action provides the Republic of Singapore a location to conduct enhanced aircraft training. Improving the airfield and munitions infrastructure will address capability gaps and allow for greater efficiencies.

The DAF reviewed requirements for strategic capabilities within the Indo-Pacific region and identified Andersen AFB for this initiative, dismissing five other potential locations. Once Andersen AFB was identified, several areas on the installation were considered. Only the proposed action was determined to meet the selection standards for infrastructure upgrades.

The DAF is releasing a Draft Environmental Impact Statement (EIS) for proposed F-15 Beddown and Infrastructure Upgrades at Andersen AFB, Guam. We invite you to review and provide comments on the Draft EIS. To ensure the DAF has sufficient time to consider your input, please submit comments by July 29, 2024 by the methods mentioned in the last paragraph.

The DAF has completed an "effects" test per 15 CFR Part 930 Section 930.33(a)(1). The DAF assessed cumulative effects on Guam's coastal use and resources, reviewed relevant management program enforceable policies, and determined that the project does not have foreseeable effects on Guam's defined coastal zone per 15 CFR 930, Section 930.35. The summary assessment of potential impacts relative to each enforceable policy is attached and provided in Appendix D, Table D-1 of the Draft EIS. This notification of negative determination is based on the following:

- The proposed federal activity is located entirely within federal property that by definition is excluded from Guam's coastal zone per 15 CFR 923, Section 923.33(a), and would not result in spillover effects extending into Guam's coastal zone per 15 CFR 923, Section 923(b).
- The proposed federal activities at both the airfield and the MSA-1 are located on a plateau approximately 500 feet above sea level, and a minimum of approximately 1.55 miles from the nearest coastal zone. None of the proposed federal activities would spill-over to adjacent parcels of nonfederal property.
- The proposed federal development projects are consistent with existing uses as military mission support and are entirely within areas on Andersen AFB currently used for or adjacent to airfield operations and munitions storage.
- Site-specific stormwater management infrastructure and implementation of the Stormwater Pollution Prevention Plan would avoid and minimize potential environmental effects.
- The proposed activities are similar to previous DAF activities that have been determined to have no coastal effects.

Notification of the availability of the Draft EIS will appear in the Federal Register. We invite you to review and comment. Additional information about the Proposed Action is provided in the attached Brochure. The Draft EIS is available online for review and for download at the project website, **www.aafbinfraandf15eis.com** and is also available for review at the following libraries:

- **Nieves M. Flores Memorial Library**, 254 Martyr Street, Hagatña, GU 96910; and
- **University of Guam Robert F. Kennedy Memorial Library**, Government Documents, Tan Siu Lin Building, UOG Station, 303 University Drive, Mangilao, GU 96923.

The DAF will hold public meetings in Guam to seek input on the Proposed Action. We invite you to participate. Dates, times, and locations of the meetings are included in the attached Meeting Flyer. This flyer may be reproduced and distributed. Both meetings will follow an open house format. Additional information is available on the project website. Specific materials may be requested at the addresses provided in the last paragraph.

Public, agency, and stakeholder comments provided during the public meetings, through email, via postal mail, and/or on the project website will be considered in preparation of the Final EIS. Substantive comments will be responded to in the Final EIS. The DAF also welcomes comments under Section 106 of the National Historic Preservation Act (36 CFR Part 800) regarding the identification of or effects on historic properties. To ensure the DAF has sufficient time to consider your input on the Draft EIS and Section 106 process, please submit your comments by July 29, 2024.

Regarding the Negative Determination per 15 CFR 930, Section 930.35, we are hopeful that a response from the Bureau of Statistics and Plans can occur within 30 days or less from receipt of this package. However, if no response is received from your office within 60 days, the DAF shall presume concurrence with the negative determination per 16 CFR Section 930.35(c).

If you have comments or questions on this project, or materials requests, please submit them by visiting the project website, **www.AAFBInfraAndF15EIS.com/provide-comments**. Additionally, you may provide verbal or written comments during the public meetings; or contact the project team point of contact, Mr. David Martin, via e-mail at afcec.aafb.infrasandf-15eis@us.af.mil or via US Postal Service mail at HQ AFCEC/CIE, Attn: Mr. David Martin, Bldg. 171, 2261 Hughes Ave., Ste. 155, JBSA Lackland AFB, TX 78236-9853.

Sincerely,

RUTELL.ETHAN.A.1256102249
Digitally signed by RUTELL.ETHAN.A.1256102249
Date: 2024.05.21 16:44:02 -10'00'

ETHAN A. RUTELL, Colonel, USAF
Chief, Futures Division

Attachments:
Brochure - Draft EIS for the F-15 Beddown and Infrastructure Upgrades at Andersen AFB
Meeting Flyer - Draft EIS for F-15 Beddown and Infrastructure Upgrades at Andersen AFB

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Table D-1. Summary Assessment of Effects on Guam's Coastal Zone Resources

CZMP Enforceable Policy	Policy Objective	Assessment
Development Policies		
Shore Area Development	Only those uses shall be located within the Seashore Reserve that enhance, are compatible with or do not generally detract from the surrounding coastal area's aesthetic and environmental quality and beach accessibility; or can demonstrate dependence on such a location and the lack of feasible alternative sites. *Intent:* To ensure environmental aesthetic compatibility of shore area land uses	Not applicable. There is no planned development or activity in the Seashore Reserve or in any near shore areas. All development is within federal property at Andersen AFB; therefore, areas being developed are not included in the Guam coastal zone. The new munitions igloos and airfield infrastructure would be constructed and operated in areas of the installation already providing or adjacent to those mission support land uses. Therefore, the projects would be consistent with existing land uses and would not appreciably change the existing shore aesthetic.
Urban Development	Commercial, multi-family, industrial and resort-hotel zone uses and uses requiring high levels of support facilities shall be concentrated within appropriate zone as outlined on the Guam Zoning Code. *Intent:* Cluster high impact uses such that coherent community design, function, infrastructure support and environmental compatibility are assured.	Not applicable. The project does not include plans for urban development, and all project locations are on federal property.
Rural Development	Rural districts shall be designated in which only low density residential and agricultural uses will be acceptable. Minimum lot size for these uses should be one-half acre until adequate infrastructure including functional sewering is provided. *Intent:* Provide a development pattern compatible with environmental and infrastructure support suitability and which can permit traditional lifestyle patterns to continue to the extent practicable.	Not applicable. The project locations are entirely within federal property and do not affect rural lands.

CZMP Enforceable Policy	Policy Objective	Assessment
Major Facility Siting	In evaluating the consistency of proposed major facilities with the goals, policies, and standards of the Comprehensive Development and Coastal Management Plans, Guam shall recognize the national interest in the siting of such facilities, including those associated with electric power production and transmission, petroleum refining and transmission, port and air installations, solid waste disposal, sewage treatment, and major reservoir sites. *Intent:* Include the national interest in the siting proposals for major utilities, fuel, and transport facilities.	Not applicable. The project does not include plans to site, construct, or operate any major utilities, fuel, or transport facilities. The proposed project would expand existing utility and field infrastructure to support the proposed facilities at the airfield and MSA-1 within federal property.
Hazardous Areas	Identified hazardous lands, including flood plains, erosion-prone areas, air installations' crash and sound zones and major fault lines shall be developed only to the extent that such development does not pose unreasonable risks to the health, safety or welfare of the people of Guam, and complies with the land use regulations. *Intent:* Development in hazardous areas will be governed by the degree of hazard and the land use regulations.	Not applicable. The Proposed Action would be contained within federal property. Construction activities would comply with applicable building standards for seismic risks and sinkholes associated with limestone karst. Should unexploded munitions be encountered as part of the grading and construction activities, workers would cease activities, in accordance with federal regulations, and immediately report the finding to the appropriate installation safety personnel. Storage of munitions in the proposed igloos would not result in appreciable changes to the existing federally required explosive safety quantity distances for MSA-1. The proposed facilities are sited into areas on the installation that already provide munitions storage and airfield infrastructure, and do not include proposed development in hazardous areas outside of the installation.

CZMP Enforceable Policy	Policy Objective	Assessment
Housing	The government shall encourage efficient design of residential areas, restrict such development in areas highly susceptible to natural and human-made hazards, and recognize the limitations of the island's resources to support historical patterns of residential development. *Intent:* Promote efficient community design placed where the resources can support it.	Not applicable. There is no planned residential development.
Transportation	Guam shall develop an efficient and safe transportation system, while limiting adverse environmental impacts on primary aquifers, beaches, estuaries, coral reefs, and other coastal resources. *Intent:* Provide transportation systems while protecting potentially impacted resources.	Not applicable. All transportation infrastructure for this project would be contained within federal property. Expansion of the airfield to include the new infrastructure would include construction and use of additional aprons and taxiways to support safe transit of aircraft to and from hangars and the airfield. These would not be used for general vehicle transit.
Erosion and Siltation	Development shall be limited in areas of 15% or greater slope by requiring strict compliance with erosion, sedimentation, and land use regulations, as well as other related land use guidelines for such areas. *Intent:* Control Development where erosion and siltation damage are likely to occur.	Not applicable. The Proposed Action would be implemented entirely within federal property and outside the Guam coastal zone. Site-specific stormwater management infrastructure and implementation of the Stormwater Pollution Prevention Plan would avoid and minimize potential environmental effects. Because the new facilities at the airfield and within MSA-1 would exceed 5,000 square feet (465 square meters) in total area of ground disturbance, the planning, design, and construction of the facilities would incorporate a low-impact development LID approach in accordance with United Facilities Criteria (UFC) 3-210-10 *Low Impact Development* and the *Technical Guidance on Implementing Stormwater Runoff Requirements for Federal Projects under Section 438 of the Energy Independence and Security Act*. Additionally, new stormwater basins and injection wells would be installed to manage runoff.

CZMP Enforceable Policy	Policy Objective	Assessment
Resources Policies:		
Air Quality	All activities and uses shall comply with all local air pollution regulations and all appropriate Federal air quality standards in order to ensure the maintenance of Guam's relatively high air quality. *Intent:* To control activities to ensure good air quality.	Not applicable. Emissions from infrastructure upgrades generated by equipment and vehicles would be intermittent and localized to MSA-1 and airfield project areas during different phases of construction. The F-15 beddown would not: (1) exceed the PSD major source thresholds in the AQCR 246 attainment area; nor (2) contribute to a violation of any federal, state, or local air regulation.
Water Quality	Safe drinking water shall be assured, and aquatic recreation sites shall be protected through the regulation of uses and discharges that pose a pollution threat to Guam's waters, particularly in estuaries, reef, and aquifer areas. *Intent:* To control activities that may degrade Guam's drinking, recreational, and ecologically sensitive waters.	Not applicable. The project would be entirely within federal property, and there are no surface waters on or near the MSA-1 or airfield that would be affected to potentially contribute to downstream coastal zone effects. A site-specific Stormwater Pollution Prevention Plan and Spill Prevention, Control, and Countermeasure Plan minimize potential for groundwater contamination from leaks and spills from stored fuels, motor pool wastes, and other materials used during operations.
Fragile Areas	Development in the following types of fragile areas including Guam's Marine Protected Areas (MPA) shall be regulated to protect their unique character: • historical and archeological sites • wildlife habitats • pristine marine and terrestrial communities • limestone forests • mangrove stands and other wetlands • coral reefs *Intent:* To protect significant cultural areas, and natural marine and terrestrial wildlife and plant habitats.	Not applicable. The project would be implemented and affect resources entirely within federal property. No mangrove stands, wetlands, MPA, coral reefs, or other marine communities would be affected by the Proposed Action site preparation, construction, or operational activities. During Section 7 and Section 106 consultations, the DAF will request concurrence with the conclusions in the EIS regarding potential effects on protected species and cultural resources on the installation, respectively.

CZMP Enforceable Policy	Policy Objective	Assessment
Living Marine Resources	All living resources within the waters of Guam, particularly fish, shall be protected from over harvesting and, in the case of corals, sea turtles and marine mammals, from any taking whatsoever. *Intent:* To protect marine resources in Guam's waters.	Not applicable. No marine resources or near shore areas would be affected by the Proposed Action site preparation, construction, or operational activities.
Visual Quality	Preservation and enhancement of, and respect for the island's scenic resources shall be encouraged through increased enforcement of and compliance with sign, litter, zoning, subdivision, building and related land-use laws. Visually objectionable uses shall be located to the maximum extent practicable so as not to degrade significant views from scenic overlooks, highways, and trails. *Intent:* To protect the quality of Guam's natural scenic beauty.	Not applicable. The planned development and activities would occur entirely within the military installation, and would not be visible from scenic overlooks, highways, trails, or other public areas. The new munitions igloos and airfield infrastructure would be constructed and operated in areas of the installation already providing those mission support land uses. Therefore, the projects would be consistent with existing land uses and would not appreciably change the existing aesthetic.
Recreation Areas	The Government of Guam shall encourage development of varied types of recreational facilities located and maintained so as to be compatible with the surrounding environment and land uses, adequately serve community centers and urban areas and protect beaches and such passive recreational areas as wildlife, marine conservation and marine protected areas, scenic overlooks, parks, and historical sites. Developments, activities and uses shall comply with the Guam Recreational Water Use Management Plan (RWUMP). *Intent:* To encourage environmentally compatible recreational development.	Not applicable. There is no planned development outside the military installation or in recreational areas, and no recreational areas would be affected by proposed activities.

CZMP Enforceable Policy	Policy Objective	Assessment
Public Access	The public's right of unrestricted access shall be ensured to all non-federally owned beach areas and all Guam recreation areas, parks, scenic overlooks, designated conservation areas and their public lands. Agreements shall be encouraged with the owners of private and federal property for the provision of releasable access to and use of resources of public nature located on such land. *Intent:* To ensure the right of public access.	Not Applicable. None of the planned development and activities would affect public access to beaches, shore areas, parks, or other public lands.
Agricultural Lands	Critical agricultural land shall be preserved and maintained for agricultural use. *Intent:* To stop urban types of development on agricultural land.	Not Applicable. There is no planned development outside the military installation or on agricultural lands.

APPENDICES

Appendix E: Socioeconomics Analysis Supporting Documentation

ENVIRONMENTAL IMPACT STATEMENT for
F-15 BEDDOWN and INFRASTRUCTURE UPGRADES
at ANDERSEN AIR FORCE BASE, GUAM

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Appendix E: Socioeconomics Analysis Supporting Documentation

Tables

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E-1. Economic Impact Analysis of Construction Spending

Economic impact analyses are often performed using commercial software such as IMPLAN®. IMPLAN® uses United States (U.S.) business transaction data and industry sector classifications to determine how spending in one sector leads to purchases of goods and services from all other sectors, including households. IMPLAN® summarizes the total amount and type of transactions as "multipliers." These economic multipliers are multiplicative factors derived from input-output (I-O) tables that can be used to assess how expenditures in one sector led to wider economic activity across other sectors. Analytically, the product of a multiplier and a spending level can produce estimates of total "direct" (within-sector impacts), "indirect" (across-sector impacts), and "induced" (household spending impacts).

IMPLAN® accounts for business transactions for several types of construction, as defined by the U.S. Census. Using IMPLAN® involves determining which of its sectors provides a reasonable approximation to purchases of the project being analyzed. The closest construction sector in IMPLAN® to the Proposed Action is assumed to be sector 54 – Construction of New Highways and Streets, for several reasons. First, similar to road construction, the Proposed Action is likely to involve significant amounts of horizontal concrete construction and stormwater management. It is also assumed that the Proposed Action will require similar types of goods and services from design and environmental services, materials, transportation, and other sectors.

IMPLAN® data are also customizable in a multitude of ways and can be adjusted so that the ratio of construction spending to employment more directly correlates with the project rather than be based solely on the local industry data. Recognizing that IMPLAN® sector 54 differs from the Proposed Action, the IMPLAN® data on that sector was adjusted to reflect differences in labor demand expected for the Proposed Action. Only the labor demand data were adjusted, and data on wages and other labor factors were assumed to be the same. Note also that all dollar values were adjusted, as appropriate, to account for inflation.[1]

The Proposed Action was estimated to cost approximately $1 billion dollars (in 2021 dollars) and require approximately 5 years to complete. The Department of the Air Force (DAF) estimated that 500 workers would be required per year for the Proposed Action. Therefore, the project would require an approximate annual spending level of $200 million and an estimated labor demand of 25 workers per $10 million. Additionally, based on DAF review of construction worker demand to support current and ongoing development projects on the installation and projections for completion of those projects, it is expected that the required 500 workers would already be present on the island and available to support the Proposed Action at its start in 2024. These estimates are consistent with recent Department of Defense (DoD) proposals for project efforts on Guam and recently collected data from the Guam Government Department of Labor (GuamGov DOL).

[1] Note that the analysis was initially conducted in IMPLAN® and was updated in 2023. As a part of the update, the analysis results were inflated to 2023 dollars using the Gross Domestic Product deflator from the U.S. Bureau of Economic Analysis Table 1.1.9. Implicit Price Deflators for Gross Domestic Product.

GuamGov DOL provided totals for construction workers currently on Guam, the number of H-2B visa construction workers on the island and their countries of origin.[2]

Based on similar project requirements, this analysis assumed a total of approximately 30 percent of positions were anticipated to be held by Guam residents. Guam faces challenges associated with obtaining materials, equipment, and labor locally.

Note that any potential difference in economic impacts between a resident worker and a foreign worker could relate to whether a foreign worker sends some earnings back to their home country. IMPLAN® data would capture this potential difference because it tracks all household spending within the economy, relative to income earned there. Accordingly, the only difference in resident and foreign worker economic impacts relates to the percentage share that each contributes to all Proposed Action jobs.

Table E-1 summarizes the main data inputs used in the IMPLAN® analysis to account for project- specific parameters and the Guam workforce.

Table E-1. Summary of Assumptions

Assumption	Assumed Value[a]	Source of Rationale[b,c]
Annual Construction Spending	Approximately $200M per year ($2021)	HDR
Construction Implementation Duration	5 years	HDR
Worker Requirement Factor (Adjustment to IMPLAN Sector 54)	25 Workers per $10M in Spending ($2021)	DAF and GuamGov DOL
Percentage of Construction Jobs Held by Guam Residents (determines Guam resident economic contribution to total impact)	30%	DAF and GuamGov DOL

Notes: M – million
[a] All dollar values are estimates.
[b] Assumptions were based on recently completed DoD NEPA and proposals for construction efforts in Guam.
[c] Per email from G. Massey (GuamGov DOL) to HDR regarding construction worker and H-2B Visa workers. July 20, 2021.

Several forms of economic impacts, presented below, are produced from IMPLAN® multipliers such as jobs, labor income, and gross island product (GIP; i.e., the total impact of spending on the economy). For each economic impact metric, several stages of spending are presented, and the sum of all three types of spending is equal to the total impact.

Considering employment first, **Table E-2** shows the following results:

- **Direct impacts** account for the effects of construction spending within the construction sector that remain on the island. Under the Proposed Action, the direct impact of construction spending involving 500 construction employees over 5 years, and approximately 30 percent of those employees would be come from Guam.
- **Indirect impacts** represent the number of ancillary employees in Guam that would be involved in providing the goods and services associated with approximately $200 million

[2] Per email from G. Massey (GuamGov DOL) to HDR regarding construction worker and H-2B Visa workers. July 20, 2021.

in construction spending per year. **Table E-2** indicates that approximately 286 such employees would be hired because of the Proposed Action; over 5 years, this amounts to a total of 1,432 job-years.

- **Induced impacts** are associated with the increase in spending by households that occur because of all direct and indirect jobs created by the $200 million in construction spending per year. **Table E-2** indicates that an additional 106 jobs would be created each year by household spending.

Table E-2. Impact on Employment Demand

Type of Impact	Annual	Total (5-Years)	Guam Resident Contribution to Total	Foreign Worker Contribution to Total
Direct Impact	500	2,500	750	1,750
Indirect Impact	286	1,423	429	1,002
Induced Impact	106	529	159	370
Total Impact	**892**	**4,460**	**1,338**	**3,122**

IMPLAN® computes the incomes earned from additional jobs using average wages for jobs in each sector. For instance, the $23.2 million in direct income is based on the average wage for all workers in IMPLAN® sector 54 (see **Table E-3**). Indirect and induced annual income payments of $12.9 million and $4.0 million, respectively, would be generated across a wide range of sectors where jobs and spending occur. Those additional income payments are computed the same way as direct income: the product of numbers of new jobs in each impacted sector and average wages per sector, respectively.

As summarized in **Table E-3**, over the 5-year construction period, labor income in Guam would increase by $200.1 million across all sectors of the economy. Approximately $60 million would be directly attributable to Guam resident earnings and spending. Income paid to foreign construction workers would amount to approximately $81.1 million (if indeed they occupy 70 percent of positions). Foreign worker spending on Guam over that time would likely add approximately $45.1 million (indirect impact) and $13.8 million (induced impact) to incomes in non-construction sector spending across the island.

Table E-3. Impact on Labor Income (in millions of 2023 dollars)

Type of Impact	Annual	Total (5-Years)	Guam Resident Contribution to Total	Foreign Worker Contribution to Total
Direct Impact	$23.2	$115.8	$34.7	$81.1
Indirect Impact	$12.9	$64.5	$19.3	$45.1
Induced Impact	$4.0	$19.8	$5.9	$13.8
Total Impact	**$40.0**	**$200.1**	**$60.0**	**$140.0**

GIP is an overall measure of economic impact because it accounts for the net contribution to the economy from spending on all goods and services. GIP for Guam is analogous to gross domestic product, which is measured on a national scale. The direct, indirect, and induced GIP impacts are shown in **Table E-4** for the Proposed Action. Results indicate that the total

economic impact of the Proposed Action would exceed $72 million per year and $361 million over the 5-year construction period.

Table E-4. Impact on Gross Island Product (in millions of 2023 dollars)

Type of Impact	Annual	Total (5-Years)	Guam Resident Contribution to Total	Foreign Worker Contribution to Total
Direct Impact	$40.9	$204.7	$61.4	$143.3
Indirect Impact	$22.6	$112.9	$33.9	$79.0
Induced Impact	$8.8	$43.9	$13.2	$30.7
Total Impact	**$72.3**	**$361.4**	**$108.4**	**$253.0**

E-2. Economic Impact Analysis of Additional Personnel

The Proposed Action also includes the beddown of up to 12 Republic of Singapore Air Force F-15 fighter aircraft at Andersen Air Force Base (AFB), and would include airfield operations, supporting aircraft operations, and personnel to support the F-15 squadron's mission requirements. The F-15 beddown is anticipated to begin in 2029 and would not be wholly dependent upon completion of the infrastructure upgrade construction. Approximately 205 personnel[3] would be required, which would include DAF and/or partner nation personnel (officer, enlisted, and civilian) and contractor support.

As of March 2023, IMPLAN® no longer provided economic data for Guam.[4] Therefore, the results of an economic assessment of the Marine Corps Base (MCB) Hawaii[5] were used to estimate the impacts of additional personnel on the Guam economy. More specifically, the results of the analysis of MCB Hawaii personnel on neighboring communities were used.[6] The original job multiplier was updated to account for productivity improvements using historical data on labor productivity for private nonfarm business sector in Hawaii from the U.S. Bureau of Labor Statistics, Office of Productivity and Technology.

As shown in **Table E-5**, additional military and civilian personnel at Andersen AFB could generate a total GIP of $60.1 million per year. In addition to the 205 personnel at the base, 29 jobs could be created in the rest of the economy as a result of household spending (induced effect). Overall, the total labor impact is estimated at $45.4 million per year.

[3] The corresponding payroll is estimated at $40.3 million (in 2023 dollars) based on an average payroll per employee of $189,760 (in 2022 dollars) (Andersen AFB. 36th Wing Economic Impact Statement 2022.).
[4] Similarly, the US. Bureau of Economic Analysis Regional Input-Output Modeling System (RIMS II) does not provide economic multipliers for any of the U.S. territories, including Guam.
[5] MCB Hawaii. Economic Impact Analysis of Marine Corps Base Hawaii. Final report prepared by Marstel-Day, LLC and HDR Engineering, Inc. May 2014.
[6] Neighboring communities consist of ZIP Codes 96701 (Aiea), 96734 (Kailua), 96744 (Kaneohe), 96795 (Waimanalo) and 96863 (MCBH Kaneohe Bay). As of 2022, the population in these ZIP codes totaled 162,251, according to the U.S. Census Bureau. By comparison, the population of Guam was estimated at 168,801.

Table E-5. Annual Impacts of Additional Personnel (in millions of 2023 dollars)

Impact Metric	Direct Impact	Indirect Impact	Induced Impact	Total Impact
GIP	$50.9	$0.0	$9.3	$60.1
Labor Income	$40.3	$0.0	$5.2	$45.4
Employment	205	0	29	234

Note that no indirect effect is associated with additional personnel because a military installation does not produce goods or services like other sectors of the economy (i.e., there is no production function). Also, the effects of personnel are a function of total payroll, regardless of the type of personnel (military versus civilian).

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APPENDICES
Appendix F: Air Quality Analysis Supporting Documentation

ENVIRONMENTAL IMPACT STATEMENT for
F-15 BEDDOWN and INFRASTRUCTURE UPGRADES
at ANDERSEN AIR FORCE BASE, GUAM

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Appendix F: Air Quality Analysis Supporting Documentation

F-1. Detailed Air Conformity Applicability Model Report

1. General Information

1. General Information

- Action Location

Base: ANDERSEN AFB
State: Guam
County(s): Guam
Regulatory Area(s): NOT IN A REGULATORY AREA

- Action Title: North Ramp Upgrades and F-15 Beddown at Andersen AFB

- Project Number/s (if applicable):

- Projected Action Start Date: 1 / 2025

- Action Purpose and Need:

The purpose of the Proposed Action is to provide critical infrastructure that enhances U.S. posture west of the International Date Line. Additionally, the purpose of the Proposed Action is to beddown and operate Republic of Singapore Air Force (RSAF) fighter aircraft at Andersen AFB to support training requirements. The Proposed Action is needed to enhance DAF capability to support U.S. and partner nation forces within the Indo-Pacific region and strengthen the U.S.'s ability to respond regionally and worldwide, through construction of infrastructure upgrades and increased support of fighter aircraft, in alignment with evolving DAF and DoD strategies and initiatives for the region. Increasing and improving airfield and munitions infrastructure would address capability gaps and allow for greater efficiencies and agility in the way ground operations are conducted.

- Action Description:

The DAF proposes to beddown and support the mission requirements of 12 RSAF F-15 fighter aircraft, and construct infrastructure upgrades at Andersen AFB, Guam, in support of DAF and DoD strategies and initiatives for the Indo-Pacific. Once construction is completed, the use of this infrastructure would be consistent with the types of operations currently occurring on the installation. The proposed infrastructure would have multiple uses, and could support both the F-15 beddown and other DAF, service component, and partner nation aircraft or missions operating from Andersen AFB now or in the future. The infrastructure would provide options for parking, storing, maintaining, refueling, loading, and unloading the F-15s and other aircraft on the installation, as well as storing munitions, which would improve upon current strategic capabilities and posture with regard to ground maneuverability. The F-15 beddown and proposed infrastructure each have standalone value for supporting the defense of U.S. interests in the Indo-Pacific region, in accordance with the Pacific Deterrence Initiative and as described in Purpose and Need for the Proposed Action.

- Point of Contact

Name: x
Title: x
Organization: x
Email: x

Phone Number: x

Report generated with ACAM version: 5.0.23a

- Activity List:

No.	Activity Type	Activity Title
2.	Construction / Demolition	North Ramp Construction
3.	Emergency Generator	Backup Generators
4.	Tanks	Jet Fuel
5.	Degreaser	Degreasers
6.	Personnel	Personnel
7.	Aircraft	F-15 LTO Operations
8.	Aircraft	F-15 TGO Operations
9.	Aircraft	Rotational KC-135 LTO Operations
10.	Aircraft	Rotational KC-135 TGO Operations
11.	Aircraft	F-15 Destination Operations
12.	Aircraft	KC-135 Destination GHG Emissions

Emission factors and air emission estimating methods come from the United States Air Force's Air Emissions Guide for Air Force Stationary Sources, Air Emissions Guide for Air Force Mobile Sources, and Air Emissions Guide for Air Force Transitory Sources.

2. Construction / Demolition

2.1 General Information & Timeline Assumptions

- Activity Location
County: Guam
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: North Ramp Construction

- Activity Description:
North Ramp Construction

- Activity Start Date
Start Month: 1
Start Month: 2025

- Activity End Date
Indefinite: False
End Month: 12
End Month: 2025

- Activity Emissions:

Pollutant	Total Emissions (TONs)	Pollutant	Total Emissions (TONs)
VOC	4.892785	PM 10	7.062782
SO_x	0.027840	PM 2.5	0.492798
NO_x	15.273637	Pb	0.000000
CO	15.769050	NH_3	0.168705

- Activity Emissions of GHG:

Pollutant	Total Emissions (TONs)	Pollutant	Total Emissions (TONs)
CH_4	0.141087	CO2	4868.191224
N_2O	0.385084	CO2e	4986.469098

- Global Scale Activity Emissions for SCGHG:

Pollutant	Total Emissions (TONs)	Pollutant	Total Emissions (TONs)
CH^4	0.141087	CO2	4868.191224
N_2O	0.385084	CO2e	4986.469098

2.1 Site Grading Phase

2.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2025

- Phase Duration
Number of Month: 12
Number of Days: 0

2.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 39621
Amount of Material to be Hauled On-Site (yd^3): 2000000
Amount of Material to be Hauled Off-Site (yd^3): 0

- Site Grading Default Settings
Default Settings Used: No
Average Day(s) worked per week: 6

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Excavators Composite	2	8
Graders Composite	2	8
Off-Highway Trucks Composite	2	0
Other Construction Equipment Composite	2	8
Rubber Tired Dozers Composite	2	8
Scrapers Composite	2	0
Tractors/Loaders/Backhoes Composite	3	8

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20
Average Hauling Truck Round Trip Commute (mile): 20

- Vehicle Exhaust Vehicle Mixture (%)

Category	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 20

- Worker Trips Vehicle Mixture (%)

Category	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

2.1.3 Site Grading Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour)

Factor	VOC	SOx	NOx	CO	PM 10	PM 2.5
Excavators Composite [HP: 36] [LF: 0.38]						
Emission Factors	0.40191	0.00542	3.44643	4.21104	0.10704	0.09848
Graders Composite [HP: 148] [LF: 0.41]						
Emission Factors	0.33951	0.00490	2.85858	3.41896	0.15910	0.14637
Off-Highway Trucks Composite [HP: 376] [LF: 0.38]						
Emission Factors	0.17748	0.00488	1.08595	1.17415	0.03850	0.03542
Other Construction Equipment Composite [HP: 82] [LF: 0.42]						
Emission Factors	0.29762	0.00487	2.89075	3.51214	0.17229	0.15851
Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]						
Emission Factors	0.37086	0.00491	3.50629	2.90209	0.15396	0.14165
Scrapers Composite [HP: 423] [LF: 0.48]						
Emission Factors	0.20447	0.00489	1.90932	1.57611	0.07394	0.06803
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
Emission Factors	0.19600	0.00489	2.00960	3.48168	0.07738	0.07119

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour)

Factor	CH4	N2O	CO2	CO2e
Excavators Composite [HP: 36] [LF: 0.38]				
Emission Factors	0.02382	0.00476	587.13772	589.15263
Graders Composite [HP: 148] [LF: 0.41]				
Emission Factors	0.02155	0.00431	531.19419	533.01712
Off-Highway Trucks Composite [HP: 376] [LF: 0.38]				
Emission Factors	0.02144	0.00429	528.58735	530.40133
Other Construction Equipment Composite [HP: 82] [LF: 0.42]				
Emission Factors	0.02141	0.00428	527.74261	529.55369

Factor	CH4	N2O	CO2	CO2e
Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]				
Emission Factors	0.02159	0.00432	532.17175	533.99803
Scrapers Composite [HP: 423] [LF: 0.48]				
Emission Factors	0.02146	0.00429	528.94235	530.75755
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
Emission Factors	0.02149	0.00430	529.86270	531.68105

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

Factor	VOC	SOx	NOx	CO	PM 10	PM 2.5	NH3
LDGV	0.26952	0.00154	0.14103	3.84122	0.00441	0.00390	0.05145
LDGT	0.22481	0.00192	0.18918	3.46257	0.00510	0.00451	0.04317
HDGV	0.78167	0.00430	0.65797	10.65810	0.02143	0.01896	0.09228
LDDV	0.10644	0.00125	0.15141	5.33268	0.00349	0.00321	0.01636
LDDT	0.21012	0.00143	0.48470	5.15564	0.00569	0.00524	0.01737
HDDV	0.12457	0.00427	2.47637	1.51837	0.05028	0.04626	0.06568
MC	2.63976	0.00182	0.67831	12.51787	0.02253	0.01993	0.05364

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

Factor	CH4	N2O	CO2	CO2e
LDGV	0.01539	0.00507	325.63146	327.52624
LDGT	0.01543	0.00713	404.10371	406.61141
HDGV	0.05371	0.02608	905.72567	914.83256
LDDV	0.05264	0.00067	370.74398	372.26042
LDDT	0.04013	0.00098	421.66823	422.96444
HDDV	0.02658	0.16189	1270.04904	1318.95535
MC	0.11135	0.00299	394.07840	397.75399

2.1.4 Site Grading Phase Formula(s)

- Fugitive Dust Emissions per Phase
$PM10_{FD}$ = (20 * ACRE * WD) / 2000

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase
CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL}* 0.002205) / 2000

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)

HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase

$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

2.2 Trenching/Excavating Phase

2.2.1 Trenching / Excavating Phase Timeline Assumptions

- Phase Start Date

Start Month: 1
Start Quarter: 1
Start Year: 2025

- Phase Duration

Number of Month: 12
Number of Days: 0

2.2.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information

Area of Site to be Trenched/Excavated (ft^2): 5943
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- Trenching Default Settings

Default Settings Used: No
Average Day(s) worked per week: 6

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Excavators Composite	2	8
Other General Industrial Equipment Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8

- Vehicle Exhaust

Average Hauling Truck Capacity (yd^3): 20
Average Hauling Truck Round Trip Commute (mile): 20

- Vehicle Exhaust Vehicle Mixture (%)

Category	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 20

- Worker Trips Vehicle Mixture (%)

Category	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

2.2.3 Trenching / Excavating Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour)

Factor	VOC	SOx	NOx	CO	PM 10	PM 2.5
Excavators Composite [HP: 36] [LF: 0.38]						
Emission Factors	0.40191	0.00542	3.44643	4.21104	0.10704	0.09848
Other General Industrial Equipment Composite [HP: 35] [LF: 0.34]						
Emission Factors	0.49122	0.00542	3.71341	4.67487	0.13603	0.12515
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
Emission Factors	0.19600	0.00489	2.00960	3.48168	0.07738	0.07119

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour)

Factor	CH_4	N_2O	CO_2	CO_2e
Excavators Composite [HP: 36] [LF: 0.38]				
Emission Factors	0.02382	0.00476	587.13772	589.15263
Other General Industrial Equipment Composite [HP: 35] [LF: 0.34]				
Emission Factors	0.02385	0.00477	588.02637	590.04433
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
Emission Factors	0.02149	0.00430	529.86270	531.68105

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

Factor	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.26952	0.00154	0.14103	3.84122	0.00441	0.00390	0.05145
LDGT	0.22481	0.00192	0.18918	3.46257	0.00510	0.00451	0.04317
HDGV	0.78167	0.00430	0.65797	10.65810	0.02143	0.01896	0.09228
LDDV	0.10644	0.00125	0.15141	5.33268	0.00349	0.00321	0.01636
LDDT	0.21012	0.00143	0.48470	5.15564	0.00569	0.00524	0.01737
HDDV	0.12457	0.00427	2.47637	1.51837	0.05028	0.04626	0.06568
MC	2.63976	0.00182	0.67831	12.51787	0.02253	0.01993	0.05364

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

Factor	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01539	0.00507	325.63146	327.52624
LDGT	0.01543	0.00713	404.10371	406.61141
HDGV	0.05371	0.02608	905.72567	914.83256
LDDV	0.05264	0.00067	370.74398	372.26042
LDDT	0.04013	0.00098	421.66823	422.96444
HDDV	0.02658	0.16189	1270.04904	1318.95535
MC	0.11135	0.00299	394.07840	397.75399

2.2.4 Trenching / Excavating Phase Formula(s)

- Fugitive Dust Emissions per Phase
$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)

H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase

$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

2.3 Building Construction Phase

2.3.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2025

- Phase Duration
Number of Month: 12

Number of Days: 0

2.3.2 Building Construction Phase Assumptions

- General Building Construction Information

Building Category: Office or Industrial
Area of Building (ft^2): 297160
Height of Building (ft): 12
Number of Units: N/A

- Building Construction Default Settings

Default Settings Used: No
Average Day(s) worked per week: 6

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Cement and Mortar Mixers Composite	1	0
Concrete/Industrial Saws Composite	1	0
Cranes Composite	2	7
Forklifts Composite	2	7
Generator Sets Composite	2	8
Other Construction Equipment Composite	1	0
Other General Industrial Equipment Composite	1	0
Other Material Handling Equipment Composite	1	0
Plate Compactors Composite	1	0
Pressure Washers Composite	1	0
Rough Terrain Forklifts Composite	1	0
Tractors/Loaders/Backhoes Composite	2	8
Welders Composite	3	8

- Vehicle Exhaust

Average Hauling Truck Round Trip Commute (mile): 20

- Vehicle Exhaust Vehicle Mixture (%)

Category	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 20

- Worker Trips Vehicle Mixture (%)

Category	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

- Vendor Trips

Average Vendor Round Trip Commute (mile): 40

- Vendor Trips Vehicle Mixture (%)

Category	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

2.3.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour)

Factor	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Cement and Mortar Mixers Composite [HP: 10] [LF: 0.56]						
Emission Factors	0.55317	0.00854	4.19957	3.25548	0.16367	0.15057
Concrete/Industrial Saws Composite [HP: 33] [LF: 0.73]						
Emission Factors	0.43930	0.00743	3.63468	4.34820	0.10060	0.09255
Cranes Composite [HP: 367] [LF: 0.29]						
Emission Factors	0.20113	0.00487	1.94968	1.66287	0.07909	0.07277
Forklifts Composite [HP: 82] [LF: 0.2]						
Emission Factors	0.26944	0.00487	2.55142	3.59881	0.13498	0.12418
Generator Sets Composite [HP: 14] [LF: 0.74]						
Emission Factors	0.54223	0.00793	4.34662	2.86938	0.17681	0.16267
Other Construction Equipment Composite [HP: 82] [LF: 0.42]						
Emission Factors	0.29762	0.00487	2.89075	3.51214	0.17229	0.15851
Other General Industrial Equipment Composite [HP: 35] [LF: 0.34]						
Emission Factors	0.49122	0.00542	3.71341	4.67487	0.13603	0.12515
Other Material Handling Equipment Composite [HP: 93] [LF: 0.4]						
Emission Factors	0.18284	0.00488	1.95728	3.45611	0.06558	0.06033
Plate Compactors Composite [HP: 8] [LF: 0.43]						
Emission Factors	0.54682	0.00884	4.14353	3.47065	0.16191	0.14896
Pressure Washers Composite [HP: 14] [LF: 0.3]						
Emission Factors	0.52906	0.00857	4.37688	3.26192	0.18062	0.16617
Rough Terrain Forklifts Composite [HP: 96] [LF: 0.4]						
Emission Factors	0.11845	0.00489	1.69423	3.22091	0.03622	0.03332
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
Emission Factors	0.19600	0.00489	2.00960	3.48168	0.07738	0.07119
Welders Composite [HP: 46] [LF: 0.45]						
Emission Factors	0.49757	0.00735	3.67618	4.52476	0.11274	0.10373

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour)

Factor	CH4	N2O	CO2	CO2e
Cement and Mortar Mixers Composite [HP: 10] [LF: 0.56]				
Emission Factors	0.02313	0.00463	570.17504	572.13174

Factor	CH4	N2O	CO2	CO2e
Concrete/Industrial Saws Composite [HP: 33] [LF: 0.73]				
Emission Factors	0.02333	0.00467	575.01338	576.98668
Cranes Composite [HP: 367] [LF: 0.29]				
Emission Factors	0.02140	0.00428	527.58451	529.39505
Forklifts Composite [HP: 82] [LF: 0.2]				
Emission Factors	0.02138	0.00428	527.10822	528.91712
Generator Sets Composite [HP: 14] [LF: 0.74]				
Emission Factors	0.02305	0.00461	568.32220	570.27253
Other Construction Equipment Composite [HP: 82] [LF: 0.42]				
Emission Factors	0.02141	0.00428	527.74261	529.55369
Other General Industrial Equipment Composite [HP: 35] [LF: 0.34]				
Emission Factors	0.02385	0.00477	588.02637	590.04433
Other Material Handling Equipment Composite [HP: 93] [LF: 0.4]				
Emission Factors	0.02145	0.00429	528.77815	530.59278
Plate Compactors Composite [HP: 8] [LF: 0.43]				
Emission Factors	0.02306	0.00461	568.40604	570.35666
Pressure Washers Composite [HP: 14] [LF: 0.3]				
Emission Factors	0.02344	0.00469	577.82852	579.81148
Rough Terrain Forklifts Composite [HP: 96] [LF: 0.4]				
Emission Factors	0.02145	0.00429	528.72612	530.54057
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
Emission Factors	0.02149	0.00430	529.86270	531.68105
Welders Composite [HP: 46] [LF: 0.45]				
Emission Factors	0.02305	0.00461	568.30078	570.25105

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

Factor	VOC	SOx	NOx	CO	PM 10	PM 2.5	NH3
LDGV	0.26952	0.00154	0.14103	3.84122	0.00441	0.00390	0.05145
LDGT	0.22481	0.00192	0.18918	3.46257	0.00510	0.00451	0.04317
HDGV	0.78167	0.00430	0.65797	10.65810	0.02143	0.01896	0.09228
LDDV	0.10644	0.00125	0.15141	5.33268	0.00349	0.00321	0.01636
LDDT	0.21012	0.00143	0.48470	5.15564	0.00569	0.00524	0.01737
HDDV	0.12457	0.00427	2.47637	1.51837	0.05028	0.04626	0.06568
MC	2.63976	0.00182	0.67831	12.51787	0.02253	0.01993	0.05364

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

Factor	CH4	N2O	CO2	CO2e
LDGV	0.01539	0.00507	325.63146	327.52624

Factor	CH4	N2O	CO2	CO2e
LDGT	0.01543	0.00713	404.10371	406.61141
HDGV	0.05371	0.02608	905.72567	914.83256
LDDV	0.05264	0.00067	370.74398	372.26042
LDDT	0.04013	0.00098	421.66823	422.96444
HDDV	0.02658	0.16189	1270.04904	1318.95535
MC	0.11135	0.00299	394.07840	397.75399

2.3.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = BA * BH * (0.42 / 1000) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.42 / 1000): Conversion Factor ft^3 to trips (0.42 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Vender Trips Emissions per Phase
$VMT_{VT} = BA * BH * (0.38 / 1000) * HT$

VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.38 / 1000): Conversion Factor ft^3 to trips (0.38 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

2.4 Architectural Coatings Phase

2.4.1 Architectural Coatings Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2025

- Phase Duration
Number of Month: 12
Number of Days: 0

2.4.2 Architectural Coatings Phase Assumptions

- General Architectural Coatings Information
Building Category: Non-Residential
Total Square Footage (ft^2): 297160
Number of Units: N/A

- Architectural Coatings Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

Category	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

2.4.3 Architectural Coatings Phase Emission Factor(s)

- Worker Trips Criteria Pollutant Emission Factors (grams/mile)

Factor	VOC	SOx	NOx	CO	PM 10	PM 2.5	NH3
LDGV	0.26952	0.00154	0.14103	3.84122	0.00441	0.00390	0.05145
LDGT	0.22481	0.00192	0.18918	3.46257	0.00510	0.00451	0.04317
HDGV	0.78167	0.00430	0.65797	10.65810	0.02143	0.01896	0.09228
LDDV	0.10644	0.00125	0.15141	5.33268	0.00349	0.00321	0.01636
LDDT	0.21012	0.00143	0.48470	5.15564	0.00569	0.00524	0.01737
HDDV	0.12457	0.00427	2.47637	1.51837	0.05028	0.04626	0.06568
MC	2.63976	0.00182	0.67831	12.51787	0.02253	0.01993	0.05364

- Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

Factor	CH4	N2O	CO2	CO2e
LDGV	0.01539	0.00507	325.63146	327.52624
LDGT	0.01543	0.00713	404.10371	406.61141
HDGV	0.05371	0.02608	905.72567	914.83256
LDDV	0.05264	0.00067	370.74398	372.26042
LDDT	0.04013	0.00098	421.66823	422.96444
HDDV	0.02658	0.16189	1270.04904	1318.95535
MC	0.11135	0.00299	394.07840	397.75399

2.4.4 Architectural Coatings Phase Formula(s)

- Worker Trips Emissions per Phase
$VMT_{WT} = (1 * WT * PA) / 800$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
1: Conversion Factor man days to trips (1 trip / 1 man * day)
WT: Average Worker Round Trip Commute (mile)
PA: Paint Area (ft^2)
800: Conversion Factor square feet to man days (1 ft^2 / 1 man * day)

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Off-Gassing Emissions per Phase
$VOC_{AC} = (AB * 2.0 * 0.0116) / 2000.0$

VOC_{AC}: Architectural Coating VOC Emissions (TONs)
BA: Area of Building (ft^2)
2.0: Conversion Factor total area to coated area (2.0 ft^2 coated area / total area)
0.0116: Emission Factor (lb/ft^2)

2000: Conversion Factor pounds to tons

2.5 Paving Phase

2.5.1 Paving Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2025

- Phase Duration
Number of Month: 12
Number of Days: 0

2.5.2 Paving Phase Assumptions

- General Paving Information
Paving Area (ft^2): 328900

- Paving Default Settings
Default Settings Used: No
Average Day(s) worked per week: 6

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Pavers Composite	2	8
Paving Equipment Composite	4	6
Rollers Composite	4	6

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20

- Vehicle Exhaust Vehicle Mixture (%)

Category	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20

- Worker Trips Vehicle Mixture (%)

Category	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

2.5.3 Paving Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour)

Factor	VOC	SOx	NOx	CO	PM 10	PM 2.5
Pavers Composite [HP: 81] [LF: 0.42]						
Emission Factors	0.24787	0.00486	2.64574	3.44523	0.13933	0.12819
Paving Equipment Composite [HP: 89] [LF: 0.36]						
Emission Factors	0.20238	0.00487	2.21583	3.41771	0.08945	0.08229
Rollers Composite [HP: 36] [LF: 0.38]						
Emission Factors	0.56682	0.00541	3.67816	4.11298	0.16639	0.15308

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour)

Factor	CH4	N2O	CO2	CO2e
Pavers Composite [HP: 81] [LF: 0.42]				
Emission Factors	0.02136	0.00427	526.53742	528.34436
Paving Equipment Composite [HP: 89] [LF: 0.36]				
Emission Factors	0.02141	0.00428	527.68636	529.49724
Rollers Composite [HP: 36] [LF: 0.38]				
Emission Factors	0.02381	0.00476	586.90234	588.91644

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

Factor	VOC	SOx	NOx	CO	PM 10	PM 2.5	NH3
LDGV	0.26952	0.00154	0.14103	3.84122	0.00441	0.00390	0.05145
LDGT	0.22481	0.00192	0.18918	3.46257	0.00510	0.00451	0.04317
HDGV	0.78167	0.00430	0.65797	10.65810	0.02143	0.01896	0.09228
LDDV	0.10644	0.00125	0.15141	5.33268	0.00349	0.00321	0.01636
LDDT	0.21012	0.00143	0.48470	5.15564	0.00569	0.00524	0.01737
HDDV	0.12457	0.00427	2.47637	1.51837	0.05028	0.04626	0.06568
MC	2.63976	0.00182	0.67831	12.51787	0.02253	0.01993	0.05364

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

Factor	CH4	N2O	CO2	CO2e
LDGV	0.01539	0.00507	325.63146	327.52624
LDGT	0.01543	0.00713	404.10371	406.61141
HDGV	0.05371	0.02608	905.72567	914.83256
LDDV	0.05264	0.00067	370.74398	372.26042
LDDT	0.04013	0.00098	421.66823	422.96444
HDDV	0.02658	0.16189	1270.04904	1318.95535
MC	0.11135	0.00299	394.07840	397.75399

2.5.4 Paving Phase Formula(s)

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = PA * 0.25 * (1 / 27) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
PA: Paving Area (ft^2)
0.25: Thickness of Paving Area (ft)
(1 / 27): Conversion Factor cubic feet to cubic yards (1 yd^3 / 27 ft^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Off-Gassing Emissions per Phase
VOC_P = (2.62 * PA) / 43560 / 2000

VOC_P: Paving VOC Emissions (TONs)
2.62: Emission Factor (lb/acre)
PA: Paving Area (ft^2)
43560: Conversion Factor square feet to acre (43560 ft2 / acre)^2 / acre)
2000: Conversion Factor square pounds to TONs (2000 lb / TON)

3. Emergency Generator

3.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Guam
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Backup Generators

- Activity Description:
Backup Generators

- Activity Start Date
Start Month: 1
Start Year: 2026

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)	Pollutant	Emissions Per Year (TONs)
VOC	0.016949	PM 10	0.015248
SOx	0.014276	PM 2.5	0.015248
NOx	0.069863	Pb	0.000000
CO	0.046656	NH3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)	Pollutant	Emissions Per Year (TONs)
CH4	0.000281	CO2	6.986250
N2O	0.000056	CO2e	8.079750

3.2 Emergency Generator Assumptions

- Emergency Generator
Type of Fuel used in Emergency Generator: Diesel

Number of Emergency Generators: 3

- Default Settings Used: Yes

- Emergency Generators Consumption
Emergency Generator's Horsepower: 135 (default)
Average Operating Hours Per Year (hours): 30 (default)

3.3 Emergency Generator Emission Factor(s)

- Emergency Generators Criteria Pollutant Emission Factor (lb/hp-hr)

VOC	SOx	NOx	CO	PM 10	PM 2.5	Pb	NH3
0.00279	0.00235	0.0115	0.00768	0.00251	0.00251	—	—

- Emergency Generators Greenhouse Gasses Pollutant Emission Factor (lb/hp-hr)

CH4	N2O	CO2	CO2e
0.000046297	0.000009259	1.15	1.33

3.4 Emergency Generator Formula(s)

- Emergency Generator Emissions per Year
AE_{POL}= (NGEN * HP * OT * EF_{POL}) / 2000

AE_{POL}: Activity Emissions (TONs per Year)
NGEN: Number of Emergency Generators
HP: Emergency Generator's Horsepower (hp)
OT: Average Operating Hours Per Year (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hp-hr)

4. Tanks

4.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Guam
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Jet Fuel

- Activity Description:
Jet Fuel

- Activity Start Date
Start Month: 1
Start Year: 2026

- Activity End Date
Indefinite: Yes
End Month: N/A

End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)	Pollutant	Emissions Per Year (TONs)
VOC	0.298118	PM 10	0.000000
SOx	0.000000	PM 2.5	0.000000
NOx	0.000000	Pb	0.000000
CO	0.000000	NH3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)	Pollutant	Emissions Per Year (TONs)
CH4	0.000000	CO2	0.000000
N2O	0.000000	CO2e	0.000000

4.2 Tanks Assumptions

- Chemical

Chemical Name: Jet kerosene (JP-5, JP-8 or Jet-A)
Chemical Category: Petroleum Distillates
Chemical Density: 7
Vapor Molecular Weight (lb/lb-mole): 130
Stock Vapor Density (lb/ft^3): 0.000170775135930213
Vapor Pressure: 0.00725
Vapor Space Expansion Factor (dimensionless): 0.068

- Tank

Type of Tank: Horizontal Tank
Tank Length (ft): 20
Tank Diameter (ft): 35
Annual Net Throughput (gallon/year): 2960000

4.3 Tank Formula(s)

- Vapor Space Volume

$VSV = (PI / 4) * D^2 * L / 2$

VSV: Vapor Space Volume (ft^3)
PI: PI Math Constant
D^2: Tank Diameter (ft)
L: Tank Length (ft)
2: Conversion Factor (Vapor Space Volume is assumed to be one-half of the tank volume)

- Vented Vapor Saturation Factor

$VVSF = 1 / (1 + (0.053 * VP * L / 2))$

VVSF: Vented Vapor Saturation Factor (dimensionless)
0.053: Constant
VP: Vapor Pressure (psia)
L: Tank Length (ft)

- Standing Storage Loss per Year

$SSL_{VOC} = 365 * VSV * SVD * VSEF * VVSF / 2000$

SSL_{VOC}: Standing Storage Loss Emissions (TONs)
365: Number of Daily Events in a Year (Constant)
VSV: Vapor Space Volume (ft^3)
SVD: Stock Vapor Density (lb/ft^3)
VSEF: Vapor Space Expansion Factor (dimensionless)
VVSF: Vented Vapor Saturation Factor (dimensionless)
2000: Conversion Factor pounds to tons

- Number of Turnovers per Year
NT = (7.48 * ANT) / ((PI / 4.0) * D * L)

NT: Number of Turnovers per Year
7.48: Constant
ANT: Annual Net Throughput
PI: PI Math Constant
D^2: Tank Diameter (ft)
L: Tank Length (ft)

- Working Loss Turnover (Saturation) Factor per Year
WLSF = (18 + NT) / (6 * NT)

WLSF: Working Loss Turnover (Saturation) Factor per Year
18: Constant
NT: Number of Turnovers per Year
6: Constant

- Working Loss per Year
WL_{VOC} = 0.0010 * VMW * VP * ANT * WLSF / 2000

0.0010: Constant
VMW: Vapor Molecular Weight (lb/lb-mole)
VP: Vapor Pressure (psia)
ANT: Annual Net Throughput
WLSF: Working Loss Turnover (Saturation) Factor
2000: Conversion Factor pounds to tons

5. Degreaser

5.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Guam
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Degreasers

- Activity Description:
Degreasers

- Activity Start Date
Start Month: 1

Start Year: 2026

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)	Pollutant	Emissions Per Year (TONs)
VOC	3.256500	PM 10	0.000000
SOx	0.000000	PM 2.5	0.000000
NOx	0.000000	Pb	0.000000
CO	0.000000	NH3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)	Pollutant	Emissions Per Year (TONs)
CH4	0.000000	CO2	0.000000
N2O	0.000000	CO2e	0.000000

5.2 Degreaser Assumptions

- Degreaser
Net solvent usage (total less recycle) (gallons/year): 1000

- Default Settings Used: Yes

- Degreaser Consumption
Solvent used: Mineral Spirits CAS#64475-85-0 (default)
Specific gravity of solvent: 0.78 (default)
Solvent VOC content (%): 100 (default)
Efficiency of control device (%): 0 (default)

5.3 Degreaser Formula(s)

- Degreaser Emissions per Year
DE_{VOC}= (VOC / 100) * NS * SG * 8.35 * (1 - (CD / 100)) / 2000

DE_{VOC}: Degreaser VOC Emissions (TONs per Year)
VOC: Solvent VOC content (%)
(VOC / 100): Conversion Factor percent to decimal
NS: Net solvent usage (total less recycle) (gallons/year)
SG: Specific gravity of solvent
8.35: Conversion Factor the density of water
CD: Efficiency of control device (%)
(1 - (CD / 100)): Conversion Factor percent to decimal (Not effected by control device)
2000: Conversion Factor pounds to tons

6. Personnel

6.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Guam
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Personnel

- Activity Description:
Personnel

- Activity Start Date
Start Month: 1
Start Year: 2026

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)	Pollutant	Emissions Per Year (TONs)
VOC	0.382400	PM 10	0.007429
SOx	0.002547	PM 2.5	0.006573
NOx	0.221167	Pb	0.000000
CO	5.184852	NH3	0.065633

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)	Pollutant	Emissions Per Year (TONs)
CH4	0.022573	CO2	538.324717
N2O	0.008793	CO2e	541.505471

6.2 Personnel Assumptions

- Number of Personnel
Active Duty Personnel: 205
Civilian Personnel: 50
Support Contractor Personnel: 0
Air National Guard (ANG) Personnel: 0
Reserve Personnel: 0

- Default Settings Used: Yes

- Average Personnel Round Trip Commute (mile): 20 (default)

- Personnel Work Schedule
Active Duty Personnel: 5 Days Per Week (default)
Civilian Personnel: 5 Days Per Week (default)
Support Contractor Personnel: 5 Days Per Week (default)
Air National Guard (ANG) Personnel: 4 Days Per Week (default)
Reserve Personnel: 4 Days Per Month (default)

6.3 Personnel On Road Vehicle Mixture

- On Road Vehicle Mixture (%)

Category	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	37.55	60.32	0	0.03	0.2	0	1.9
GOVs	54.49	37.73	4.67	0	0	3.11	0

6.4 Personnel Emission Factor(s)

- On Road Vehicle Criteria Pollutant Emission Factors (grams/mile)

Factor	VOC	SOx	NOx	CO	PM 10	PM 2.5	NH3
LDGV	0.24066	0.00152	0.12188	3.67987	0.00436	0.00385	0.04956
LDGT	0.20033	0.00188	0.15216	3.18088	0.00498	0.00441	0.04181
HDGV	0.70246	0.00431	0.58267	9.91727	0.02015	0.01783	0.09128
LDDV	0.10429	0.00124	0.14961	5.44568	0.00362	0.00333	0.01648
LDDT	0.16176	0.00141	0.42024	4.73661	0.00570	0.00524	0.01701
HDDV	0.11245	0.00420	2.33871	1.47151	0.04331	0.03984	0.06634
MC	2.63225	0.00182	0.67640	12.36904	0.02253	0.01993	0.05402

- On Road Vehicle Greenhouse Gasses Emission Factors (grams/mile)

Factor	CH4	N2O	CO2	CO2e
LDGV	0.01395	0.00489	320.84361	322.64634
LDGT	0.01330	0.00683	396.75609	399.12151
HDGV	0.05013	0.02628	909.14528	918.22168
LDDV	0.05272	0.00067	368.45987	369.97807
LDDT	0.03926	0.00099	416.19151	417.46714
HDDV	0.02632	0.16334	1251.47197	1300.80653
MC	0.10977	0.00298	394.18945	397.82058

6.5 Personnel Formula(s)

- Personnel Vehicle Miles Travel for Work Days per Year
$VMT_P = NP * WD * AC$

VMT_P: Personnel Vehicle Miles Travel (miles/year)
NP: Number of Personnel
WD: Work Days per Year
AC: Average Commute (miles)

- Total Vehicle Miles Travel per Year
$VMT_{Total} = VMT_{AD} + VMT_C + VMT_{SC} + VMT_{ANG} + VMT_{AFRC}$

VMT_{Total}: Total Vehicle Miles Travel (miles)
VMT_{AD}: Active Duty Personnel Vehicle Miles Travel (miles)
VMT_C: Civilian Personnel Vehicle Miles Travel (miles)
VMT_{SC}: Support Contractor Personnel Vehicle Miles Travel (miles)
VMT_{ANG}: Air National Guard Personnel Vehicle Miles Travel (miles)

VMT_{AFRC}: Reserve Personnel Vehicle Miles Travel (miles)

- Vehicle Emissions per Year
$V_{POL} = (VMT_{Total} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{Total}: Total Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Personnel On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

7. Aircraft

7.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Guam
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: F-15 LTO Operations

- Activity Description:
F-15s were conservatively used for all rotational aircraft. which could be either F-15s or F16s.

- Activity Start Date
Start Month: 1
Start Year: 2025

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)	Pollutant	Emissions Per Year (TONs)
VOC	19.693265	PM 10	2.390680
SOx	3.721025	PM 2.5	2.149092
NOx	39.260943	Pb	0.000000
CO	69.272537	NH3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)	Pollutant	Emissions Per Year (TONs)
CH4	0.468432	CO2	11140.263224
N2O	0.091391	CO2e	11179.212275

- Activity Emissions of Criteria Pollutants [LTO Flight Operations (includes Trim Test & APU) part]:

Pollutant	Emissions Per Year (TONs)	Pollutant	Emissions Per Year (TONs)
VOC	19.693265	PM 10	2.390680
SOx	3.721025	PM 2.5	2.149092
NOx	39.260943	Pb	0.000000
CO	69.272537	NH3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LTO Flight Operations (includes Trim Test & APU) part]:

Pollutant	Emissions Per Year (TONs)	Pollutant	Emissions Per Year (TONs)
CH4	0.468432	CO2	11140.263224
N2O	0.091391	CO2e	11179.212275

7.2 Aircraft & Engines

7.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: F-15E
Engine Model: F100-PW-220
Primary Function: Combat
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

7.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

Factor	Fuel Flow	VOC	SOx	NOx	CO	PM 10	PM 2.5
Idle	2084.00	7.94	1.07	4.61	35.32	0.67	0.60
Approach	3837.00	5.12	1.07	12.50	1.92	0.70	0.63
Intermediate	5770.00	2.89	1.07	22.20	0.86	0.70	0.63
Military	9679.00	2.08	1.07	29.60	0.86	0.91	0.82
After Burn	41682.00	1.60	1.07	8.20	11.87	0.38	0.35

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

Factor	Fuel Flow	CH4	N2O	CO2	CO2e
Idle	2084.00	0.13	0.03	3203.44	3214.64
Approach	3837.00	0.13	0.03	3203.44	3214.64
Intermediate	5770.00	0.13	0.03	3203.44	3214.64
Military	9679.00	0.13	0.03	3203.44	3214.64
After Burn	41682.00	0.13	0.03	3203.44	3214.64

7.3 Flight Operations

7.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		12
Flight Operation Cycle Type:	LTO (Landing and Takeoff)	
Number of Annual Flight Operation Cycles for all Aircraft:		2376
Number of Annual Trim Test(s) per Aircraft:		12

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	21.2
Approach [Approach] (mins):	2.21
Climb Out [Intermediate] (mins):	0.66
Takeoff [Military] (mins):	0.78
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	12
Approach (mins):	27
Intermediate (mins):	9
Military (mins):	9
AfterBurn (mins):	3

7.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE\_IN} + AEM_{IDLE\_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL}$ = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

7.4 Auxiliary Power Unit (APU)

7.4.1 Auxiliary Power Unit (APU) Assumptions

- Default Settings Used: Yes

- Auxiliary Power Unit (APU) (default)

Number of APU per Aircraft	Operation Hours for Each LTO	Exempt Source?	Designation	Manufacturer
—	—	—	—	—

7.4.2 Auxiliary Power Unit (APU) Emission Factor(s)

- Auxiliary Power Unit (APU) Criteria Pollutant Emission Factors (lb/hr)

Designation	Fuel Flow	VOC	SOx	NOx	CO	PM 10	PM 2.5
—	—	—	—	—	—	—	—

- Auxiliary Power Unit (APU) Greenhouse Gasses Emission Factors (lb/hr)

Designation	Fuel Flow	CH4	N2O	CO2	CO2e
—	—	—	—	—	—

7.4.3 Auxiliary Power Unit (APU) Formula(s)

- Auxiliary Power Unit (APU) Emissions per Year
$APU_{POL} = APU * OH * LTO * EF_{POL} / 2000$

APU_{POL}: Auxiliary Power Unit (APU) Emissions per Pollutant (TONs)
APU: Number of Auxiliary Power Units

OH: Operation Hours for Each LTO (hour)
LTO: Number of LTOs
EF_{POL}: Emission Factor for Pollutant (lb/hr)
2000: Conversion Factor pounds to tons

8. Aircraft

8.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Guam
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: F-15 TGO Operations

- Activity Description:
F-15s were conservatively used for all rotational aircraft. which could be either F-15s or F16s.

- Activity Start Date
Start Month: 1
Start Year: 2025

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)	Pollutant	Emissions Per Year (TONs)
VOC	1.804366	PM 10	0.371628
SOx	0.536685	PM 2.5	0.334563
NOx	9.970511	Pb	0.000000
CO	0.637642	NH3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)	Pollutant	Emissions Per Year (TONs)
CH4	0.067562	CO2	1606.766166
N2O	0.013181	CO2e	1612.383809

- Activity Emissions of Criteria Pollutants [CP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)	Pollutant	Emissions Per Year (TONs)
VOC	1.804366	PM 10	0.371628
SOx	0.536685	PM 2.5	0.334563
NOx	9.970511	Pb	0.000000
CO	0.637642	NH3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [CP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)	Pollutant	Emissions Per Year (TONs)
CH4	0.067562	CO2	1606.766166
N2O	0.013181	CO2e	1612.383809

8.2 Aircraft & Engines

8.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: F-15E
Engine Model: F100-PW-220
Primary Function: Combat
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

8.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

Factor	Fuel Flow	VOC	SOx	NOx	CO	PM 10	PM 2.5
Idle	2084.00	7.94	1.07	4.61	35.32	0.67	0.60
Approach	3837.00	5.12	1.07	12.50	1.92	0.70	0.63
Intermediate	5770.00	2.89	1.07	22.20	0.86	0.70	0.63
Military	9679.00	2.08	1.07	29.60	0.86	0.91	0.82
After Burn	41682.00	1.60	1.07	8.20	11.87	0.38	0.35

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

Factor	Fuel Flow	CH4	N2O	CO2	CO2e
Idle	2084.00	0.13	0.03	3203.44	3214.64
Approach	3837.00	0.13	0.03	3203.44	3214.64
Intermediate	5770.00	0.13	0.03	3203.44	3214.64
Military	9679.00	0.13	0.03	3203.44	3214.64
After Burn	41682.00	0.13	0.03	3203.44	3214.64

8.3 Flight Operations

8.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 12
Flight Operation Cycle Type: CP (Close Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 1377
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	2.21
Climb Out [Intermediate] (mins):	1.58
Takeoff [Military] (mins):	0.44
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

8.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE\_IN} + AEM_{IDLE\_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines

NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

9. Aircraft

9.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Guam
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Rotational KC-135 LTO Operations

- Activity Description:
Rotational KC-135 LTO Operations

- Activity Start Date
Start Month: 1
Start Year: 2025

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)	Pollutant	Emissions Per Year (TONs)
VOC	0.007109	PM 10	0.162895
SOx	0.120875	PM 2.5	0.146574
NOx	0.976044	Pb	0.000000
CO	0.767367	NH3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)	Pollutant	Emissions Per Year (TONs)
CH4	0.015217	CO2	361.884331
N2O	0.002969	CO2e	363.149566

- Activity Emissions of Criteria Pollutants [LTO Flight Operations (includes Trim Test & APU) part]:

Pollutant	Emissions Per Year (TONs)	Pollutant	Emissions Per Year (TONs)
VOC	0.007109	PM 10	0.162895
SOx	0.120875	PM 2.5	0.146574
NOx	0.976044	Pb	0.000000
CO	0.767367	NH3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LTO Flight Operations (includes Trim Test & APU) part]:

Pollutant	Emissions Per Year (TONs)	Pollutant	Emissions Per Year (TONs)
CH4	0.015217	CO2	361.884331
N2O	0.002969	CO2e	363.149566

9.2 Aircraft & Engines

9.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: KC-135R
Engine Model: F108-CF-100
Primary Function: Transport - Bomber
Aircraft has After burn: No
Number of Engines: 4

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

9.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

Factor	Fuel Flow	VOC	SOx	NOx	CO	PM 10	PM 2.5
Idle	1136.00	0.19	1.07	3.88	23.65	2.07	1.86
Approach	2547.00	0.06	1.07	5.73	8.57	1.55	1.40
Intermediate	5650.00	0.03	1.07	11.04	2.32	0.65	0.58
Military	6458.00	0.03	1.07	12.05	0.36	1.59	1.43
After Burn	0.00	0.00	0.00	0.00	0.00	0.00	0.00

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

Factor	Fuel Flow	CH4	N2O	CO2	CO2e
Idle	1136.00	0.13	0.03	3203.44	3214.64
Approach	2547.00	0.13	0.03	3203.44	3214.64
Intermediate	5650.00	0.13	0.03	3203.44	3214.64
Military	6458.00	0.13	0.03	3203.44	3214.64
After Burn	0.00	0.13	0.03	3203.44	3214.64

9.3 Flight Operations

9.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		1
Flight Operation Cycle Type:	LTO (Landing and Takeoff)	
Number of Annual Flight Operation Cycles for all Aircraft:		20
Number of Annual Trim Test(s) per Aircraft:		12

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	14.7
Approach [Approach] (mins):	4.74
Climb Out [Intermediate] (mins):	1.17
Takeoff [Military] (mins):	1.18
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	12
Approach (mins):	27
Intermediate (mins):	9
Military (mins):	12
AfterBurn (mins):	0

9.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE\_IN} + AEM_{IDLE\_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL}$ = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

9.4 Auxiliary Power Unit (APU)

9.4.1 Auxiliary Power Unit (APU) Assumptions

- Default Settings Used: Yes

- Auxiliary Power Unit (APU) (default)

Number of APU per Aircraft	Operation Hours for Each LTO	Exempt Source?	Designation	Manufacturer
—	—	—	—	—

9.4.2 Auxiliary Power Unit (APU) Emission Factor(s)

- Auxiliary Power Unit (APU) Criteria Pollutant Emission Factors (lb/hr)

Designation	Fuel Flow	VOC	SOx	NOx	CO	PM 10	PM 2.5
—	—	—	—	—	—	—	—

- Auxiliary Power Unit (APU) Greenhouse Gasses Emission Factors (lb/hr)

Designation	Fuel Flow	CH4	N2O	CO2	CO2e
—	—	—	—	—	—

9.4.3 Auxiliary Power Unit (APU) Formula(s)

- Auxiliary Power Unit (APU) Emissions per Year
APU_{POL} = APU * OH * LTO * EF_{POL} / 2000

APU_{POL}: Auxiliary Power Unit (APU) Emissions per Pollutant (TONs)
APU: Number of Auxiliary Power Units

OH: Operation Hours for Each LTO (hour)
LTO: Number of LTOs
EF_{POL}: Emission Factor for Pollutant (lb/hr)
2000: Conversion Factor pounds to tons

10. Aircraft

10.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Guam
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Rotational KC-135 TGO Operations

- Activity Description:
Rotational KC-135 TGO Operations

- Activity Start Date
Start Month: 1
Start Year: 2025

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)	Pollutant	Emissions Per Year (TONs)
VOC	0.000795	PM 10	0.020509
SOx	0.020872	PM 2.5	0.018437
NOx	0.179765	Pb	0.000000
CO	0.085890	NH3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)	Pollutant	Emissions Per Year (TONs)
CH4	0.002627	CO2	62.487206
N2O	0.000513	CO2e	62.705677

- Activity Emissions of Criteria Pollutants [CP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)	Pollutant	Emissions Per Year (TONs)
VOC	0.000795	PM 10	0.020509
SOx	0.020872	PM 2.5	0.018437
NOx	0.179765	Pb	0.000000
CO	0.085890	NH3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [CP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)	Pollutant	Emissions Per Year (TONs)
CH4	0.002627	CO2	62.487206
N2O	0.000513	CO2e	62.705677

10.2 Aircraft & Engines

10.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: KC-135R
Engine Model: F108-CF-100
Primary Function: Transport - Bomber
Aircraft has After burn: No
Number of Engines: 4

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

10.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

Factor	Fuel Flow	VOC	SOx	NOx	CO	PM 10	PM 2.5
Idle	1136.00	0.19	1.07	3.88	23.65	2.07	1.86
Approach	2547.00	0.06	1.07	5.73	8.57	1.55	1.40
Intermediate	5650.00	0.03	1.07	11.04	2.32	0.65	0.58
Military	6458.00	0.03	1.07	12.05	0.36	1.59	1.43
After Burn	0.00	0.00	0.00	0.00	0.00	0.00	0.00

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

Factor	Fuel Flow	CH4	N2O	CO2	CO2e
Idle	1136.00	0.13	0.03	3203.44	3214.64
Approach	2547.00	0.13	0.03	3203.44	3214.64
Intermediate	5650.00	0.13	0.03	3203.44	3214.64
Military	6458.00	0.13	0.03	3203.44	3214.64
After Burn	0.00	0.13	0.03	3203.44	3214.64

10.3 Flight Operations

10.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 1
Flight Operation Cycle Type: CP (Close Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 16
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	0
Approach [Approach] (mins):	5.16
Climb Out [Intermediate] (mins):	3.61
Takeoff [Military] (mins):	0.47
Takeoff [After Burn] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

10.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE\_IN} + AEM_{IDLE\_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines

NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

11. Aircraft

11.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Guam
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: F-15 Destination Operations

- Activity Description:
F-15s were conservatively used for all rotational aircraft. which could be either F-15s or F16s.

- Activity Start Date
Start Month: 1
Start Year: 2026

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)	Pollutant	Emissions Per Year (TONs)
VOC	0.000000	PM 10	0.000000
SOx	0.000000	PM 2.5	0.000000
NOx	0.000000	Pb	0.000000
CO	0.000000	NH3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)	Pollutant	Emissions Per Year (TONs)
CH4	3185.970413	CO2	58016.836270
N2O	3184.114591	CO2e	58208.546283

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)	Pollutant	Emissions Per Year (TONs)
VOC	0.000000	PM 10	0.000000
SOx	0.000000	PM 2.5	0.000000
NOx	0.000000	Pb	0.000000
CO	0.000000	NH3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)	Pollutant	Emissions Per Year (TONs)
CH4	3185.970413	CO2	58016.836270
N2O	3184.114591	CO2e	58208.546283

11.2 Aircraft & Engines

11.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: F-15E
Engine Model: F100-PW-220
Primary Function: Combat
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

11.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

Factor	Fuel Flow	VOC	SOx	NOx	CO	PM 10	PM 2.5
Idle	2084.00	7.94	1.07	4.61	35.32	0.67	0.60
Approach	3837.00	5.12	1.07	12.50	1.92	0.70	0.63
Intermediate	5770.00	2.89	1.07	22.20	0.86	0.70	0.63
Military	9679.00	2.08	1.07	29.60	0.86	0.91	0.82
After Burn	41682.00	1.60	1.07	8.20	11.87	0.38	0.35

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

Factor	Fuel Flow	CH4	N2O	CO2	CO2e
Idle	2084.00	0.13	0.03	3203.44	3214.64
Approach	3837.00	0.13	0.03	3203.44	3214.64
Intermediate	5770.00	0.13	0.03	3203.44	3214.64
Military	9679.00	0.13	0.03	3203.44	3214.64
After Burn	41682.00	0.13	0.03	3203.44	3214.64

11.3 Flight Operations

11.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft:		12
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for all Aircraft:		2376
Number of Annual Trim Test(s) per Aircraft:		0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins):	36
Approach [Approach] (mins):	69
Climb Out [Intermediate] (mins):	12
Takeoff [Military] (mins):	2.4
Takeoff [After Burn] (mins):	0.6

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

11.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE\_IN} + AEM_{IDLE\_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL}$ = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

12. Aircraft

12.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Guam
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: KC-135 Destination GHG Emissions

- Activity Description:
KC-135 Destination GHG Emissions

- Activity Start Date
Start Month: 1
Start Year: 2026

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)	Pollutant	Emissions Per Year (TONs)
VOC	0.000000	PM 10	0.000000
SOx	0.000000	PM 2.5	0.000000

Pollutant	Emissions Per Year (TONs)	Pollutant	Emissions Per Year (TONs)
NOx	0.000000	Pb	0.000000
CO	0.000000	NH3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)	Pollutant	Emissions Per Year (TONs)
CH4	0.026954	CO2	641.028846
N2O	0.005259	CO2e	643.270038

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)	Pollutant	Emissions Per Year (TONs)
VOC	0.000000	PM 10	0.000000
SOx	0.000000	PM 2.5	0.000000
NOx	0.000000	Pb	0.000000
CO	0.000000	NH3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)	Pollutant	Emissions Per Year (TONs)
CH4	0.026954	CO2	641.028846
N2O	0.005259	CO2e	643.270038

12.2 Aircraft & Engines

12.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine

Aircraft Designation: KC-135R
Engine Model: F108-CF-100
Primary Function: Transport - Bomber
Aircraft has After burn: No
Number of Engines: 4

- Aircraft & Engine Surrogate

Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

12.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

Factor	Fuel Flow	VOC	SOx	NOx	CO	PM 10	PM 2.5
Idle	1136.00	0.19	1.07	3.88	23.65	2.07	1.86
Approach	2547.00	0.06	1.07	5.73	8.57	1.55	1.40
Intermediate	5650.00	0.03	1.07	11.04	2.32	0.65	0.58
Military	6458.00	0.03	1.07	12.05	0.36	1.59	1.43
After Burn	0.00	0.00	0.00	0.00	0.00	0.00	0.00

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

Factor	Fuel Flow	CH4	N2O	CO2	CO2e
Idle	1136.00	0.13	0.03	3203.44	3214.64
Approach	2547.00	0.13	0.03	3203.44	3214.64
Intermediate	5650.00	0.13	0.03	3203.44	3214.64
Military	6458.00	0.13	0.03	3203.44	3214.64
After Burn	0.00	0.13	0.03	3203.44	3214.64

12.3 Flight Operations

12.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft: 12
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 20
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins): 33.6
Approach [Approach] (mins): 73.2
Climb Out [Intermediate] (mins): 12
Takeoff [Military] (mins): 1.2
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

12.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$AE_{FOC} = AEM_{IDLE\_IN} + AEM_{IDLE\_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

F-2. Air Conformity Applicability Model Report Record of Air Analysis

1. General Information: The Air Force's Air Conformity Applicability Model (ACAM) was used to perform a net change in emissions analysis to assess the potential air quality impact/s associated with the action. The analysis was performed in accordance with the Air Force Manual 32-7002, *Environmental Compliance and Pollution Prevention*; the *Environmental Impact Analysis Process* (EIAP, 32 CFR 989); the *General Conformity Rule* (GCR, 40 CFR 93 Subpart B); and the *USAF Air Quality Environmental Impact Analysis Process (EIAP) Guide*. This report provides a summary of the ACAM analysis. Report generated with ACAM version: 5.0.23a

a. Action Location:
Base: ANDERSEN AFB
State: Guam
County(s): Guam
Regulatory Area(s): NOT IN A REGULATORY AREA

b. Action Title: North Ramp Upgrades and F-15 Beddown at Andersen AFB

c. Project Number/s (if applicable):

d. Projected Action Start Date: 1 / 2025

e. Action Description:

The DAF proposes to beddown and support the mission requirements of 12 RSAF F-15 fighter aircraft, and construct infrastructure upgrades at Andersen AFB, Guam, in support of DAF and DoD strategies and initiatives for the Indo-Pacific. Once construction is completed, the use of this infrastructure would be consistent with the types of operations currently occurring on the installation. The proposed infrastructure would have multiple uses, and could support both the F-15 beddown and other DAF, service component, and partner nation aircraft or missions operating from Andersen AFB now or in the future. The infrastructure would provide options for parking, storing, maintaining, refueling, loading, and unloading the F-15s and other aircraft on the installation, as well as storing munitions, which would improve upon current strategic capabilities and posture with regard to ground maneuverability. The F-15 beddown and proposed infrastructure each have standalone value for supporting the defense of U.S. interests in the Indo-Pacific region, in accordance with the Pacific Deterrence Initiative and as described in Purpose and Need for the Proposed Action.

2. Air Impact Analysis: Based on the attainment status at the action location, the requirements of the GCR are not applicable.

Total reasonably foreseeable net direct and indirect emissions associated with the action were estimated through ACAM on a calendar-year basis for the start of the action through achieving "steady state" (hsba.e., no net gain/loss in emission stabilized and the action is fully implemented) emissions. The ACAM analysis uses the latest and most accurate emission estimation techniques available; all algorithms, emission factors, and methodologies used are described in detail in the *USAF Air Emissions Guide for Air Force Stationary Sources*, the *USAF Air Emissions Guide for Air Force Mobile Sources*, and the *USAF Air Emissions Guide for Air Force Transitory Sources*.

"Insignificance Indicators" were used in the analysis to provide an indication of the significance of the proposed Action's potential impacts to local air quality. The insignificance indicators are trivial (de minimis) rate thresholds that have been demonstrated to have little to no impact to air quality. These insignificance indicators are the 250 ton/yr Prevention of Significant Deterioration (PSD) major source threshold and 25 ton/yr for lead for actions occurring in areas that are "Attainment" (hsba.e., not exceeding any National Ambient Air Quality Standard (NAAQS)). These indicators do not define a significant impact; however, they do provide a threshold to identify actions that are insignificant. Any action with net emissions below the insignificance indicators for all criteria

pollutants is considered so insignificant that the action will not cause or contribute to an exceedance on one or more NAAQS. For further detail on insignificance indicators, refer to *Level II, Air Quality Quantitative Assessment, Insignificance Indicators*.

The action's net emissions for every year through achieving steady state were compared against the Insignificance Indicators and are summarized below.

Construction Emissions (Compressed into a single year) NOT IN A REGULATORY AREA

Pollutant	Action Emissions (ton/yr)	INSIGNIFICANCE INDICATOR	
		Indicator (ton/yr)	Exceedance (Yes or No)
VOC	26.990	250	No
NOx	85.821	250	No
CO	91.152	250	No
SOx	4.437	250	No
PM 10	50.438	250	No
PM 2.5	3.879	250	No
Pb	0.000	25	No
NH3	0.169	250	No

Note: Includes concrete batch plant emissions.

Operational Emissions (Steady State) NOT IN A REGULATORY AREA

Pollutant	Action Emissions (ton/yr)	INSIGNIFICANCE INDICATOR	
		Indicator (ton/yr)	Exceedance (Yes or No)
VOC	25.460	250	No
NOx	50.678	250	No
CO	75.995	250	No
SOx	4.416	250	No
PM 10	2.968	250	No
PM 2.5	2.670	250	No
Pb	0.000	25	No
NH3	0.066	250	No

None of the estimated annual net emissions associated with this action are above the insignificance indicators; therefore, the action will not cause or contribute to an exceedance of one or more NAAQSs and will have an insignificant impact on air quality. No further air assessment is needed.

F-3. Air Conformity Applicability Model Report Greenhouse Gas 9GHG) Emissions

1. General Information: The Air Force's Air Conformity Applicability Model (ACAM) was used to perform an analysis to estimate GHG emissions and assess the theoretical Social Cost of Greenhouse Gases (SC GHG) associated with the action. The analysis was performed in accordance with the Air Force Manual 32-7002, Environmental Compliance and Pollution Prevention; the Environmental Impact Analysis Process (EIAP, 32 CFR 989); and the *USAF Air Quality Environmental Impact Analysis Process (EIAP) Guide*. This report provides a summary of GHG emissions and SC GHG analysis.

Report generated with ACAM version: 5.0.23a

a. Action Location:
Base: ANDERSEN AFB
State: Guam
County(s): Guam
Regulatory Area(s): NOT IN A REGULATORY AREA

b. Action Title: North Ramp Upgrades and F-15 Beddown at Andersen AFB

c. Project Number/s (if applicable):

d. Projected Action Start Date: 1 / 2025

e. Action Description:

The DAF proposes to beddown and support the mission requirements of 12 RSAF F-15 fighter aircraft, and construct infrastructure upgrades at Andersen AFB, Guam, in support of DAF and DoD strategies and initiatives for the Indo-Pacific. Once construction is completed, the use of this infrastructure would be consistent with the types of operations currently occurring on the installation. The proposed infrastructure would have multiple uses, and could support both the F-15 beddown and other DAF, service component, and partner nation aircraft or missions operating from Andersen AFB now or in the future. The infrastructure would provide options for parking, storing, maintaining, refueling, loading, and unloading the F-15s and other aircraft on the installation, as well as storing munitions, which would improve upon current strategic capabilities and posture with regard to ground maneuverability. The F-15 beddown and proposed infrastructure each have standalone value for supporting the defense of U.S. interests in the Indo-Pacific region, in accordance with the Pacific Deterrence Initiative and as described in Purpose and Need for the Proposed Action.

2. Analysis: Total combined direct and indirect GHG emissions associated with the action were estimated through ACAM on a calendar-year basis from the action start through the expected life cycle of the action. The life cycle for Air Force actions with "steady state" emissions (SS, net gain/loss in emission stabilized and the action is fully implemented) is assumed to be 10 years beyond the SS emissions year or 20 years beyond SS emissions year for aircraft operations related actions.

GHG Emissions Analysis Summary:

GHGs produced by fossil-fuel combustion are primarily carbon dioxide (CO2), methane (CH4), and nitrous oxide (NO2). These three GHGs represent more than 97 percent of all U.S. GHG emissions. Emissions of GHGs are typically quantified and regulated in units of CO2 equivalents (CO2e). The CO2e takes into account the global warming potential (GWP) of each GHG. The GWP is the measure of a particular GHG's ability to absorb solar radiation as well as its residence time within the atmosphere. The GWP allows comparison of global warming impacts between different gases; the higher the GWP, the more that gas contributes to climate change in comparison to CO2. All GHG emissions estimates were derived from various emission sources using the methods, algorithms,

emission factors, and GWPs from the most current Air Emissions Guide for Air Force Stationary Sources, Air Emissions Guide for Air Force Mobile Sources, and/or Air Emissions Guide for Air Force Transitory Sources.

The Air Force has adopted the Prevention of Significant Deterioration (PSD) threshold for GHG of 75,000 ton per year (ton/yr) of CO2e (or 68,039 metric ton per year [mton/yr]) as an indicator or "threshold of insignificance" for NEPA air quality impacts in all areas. This indicator does not define a significant impact; however, it provides a threshold to identify actions that are insignificant (de minimis, too trivial or minor to merit consideration). Actions with a net change in GHG (CO2e) emissions below the insignificance indicator (threshold) are considered too insignificant on a global scale to warrant any further analysis. Note that actions with a net change in GHG (CO2e) emissions above the insignificance indicator (threshold) are only considered potentially significant and require further assessment to determine if the action poses a significant impact. For further detail on insignificance indicators see Level II, Air Quality Quantitative Assessment, Insignificance Indicators (April 2023).

The following table summarizes the action-related GHG emissions on a calendar-year basis through the projected life cycle of the action. The following U.S. and State's GHG emissions estimates (next two tables) are based on a five-year average (2016 through 2020) of individual state-reported GHG emissions (Reference: State Climate Summaries 2022, NOAA National Centers for Environmental Information, National Oceanic and Atmospheric Administration. https://statesummaries.ncics.org/downloads/).

Action-Related Annual GHG Emissions (mton/yr)

YEAR	CO2	CH4	N2O	CO2e	Threshold	Exceedance
2025	16,365	0.63042558	0.44736762	16,514	68,039	No
2026-2047	65,657	2890.81218845	2888.69181942	65,879	68,039	No

State's Annual GHG Emissions (mton/yr)

YEAR	CO2	CH4	N2O	CO2e
2025	100,714,788	502,488	28,860	101,246,136
2026-2047	100,714,788	502,488	28,860	101,246,136

U.S. Annual GHG Emissions (mton/yr)

YEAR	CO2	CH4	N2O	CO2e
2025	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2026-2047	5,136,454,179	25,626,912	1,500,708	5,163,581,798

GHG Relative Significance Assessment:

A Relative Significance Assessment uses the rule of reason and the concept of proportionality along with the consideration of the affected area (yGba.e., global, national, and regional) and the degree (intensity) of the proposed action's effects. The Relative Significance Assessment provides real-world context and allows for a reasoned choice against alternatives through a relative comparison analysis. The analysis weighs each alternative's annual net change in GHG emissions proportionally against (or relative to) global, national, and regional emissions.

The action's surroundings, circumstances, environment, and background (context associated with an action) provide the setting for evaluating the GHG intensity (impact significance). From an air quality perspective, context of an action is the local area's ambient air quality relative to meeting the NAAQSs, expressed as attainment, nonattainment, or maintenance areas (this designation is considered the attainment status). GHGs are non-hazardous to health at normal ambient concentrations and, at a cumulative global scale, action-related GHG emissions can only potentially cause warming of the climatic system. Therefore, the action-related GHGs generally have an insignificant impact to local air quality.

However, the affected area (context) of GHG/climate change is global. Therefore, the intensity or degree of the proposed action's GHG/climate change effects are gauged through the quantity of GHG associated with the action as compared to a baseline of the state, U.S., and global GHG inventories. Each action (or alternative) has significance, based on their annual net change in GHG emissions, in relation to or proportionally to the global, national, and regional annual GHG emissions.

To provide real-world context to the GHG and climate change effects on a global scale, an action's net change in GHG emissions is compared relative to the state (where action will occur) and U.S. annual emissions. The following table provides a relative comparison of an action's net change in GHG emissions vs. state and U.S. projected GHG emissions for the same time period.

Total GHG Relative Significance (mton)

Year	Category	CO2	CH4	N2O	CO2e
2025–2047	State Total	2,316,440,124	11,557,235	663,775	2,328,661,133
2025–2047	U.S. Total	118,138,446,117	589,418,969	34,516,276	118,762,381,361
2025–2047	Action	1,460,822	63598.498571	63551.667395	1,465,846
—	Percent of State Totals	0.06306324%	0.55029166%	9.57428530%	0.06294804%
—	Percent of U.S. Totals	0.00123653%	0.01079003%	0.18412087%	0.00123427%

From a global context, the action's total GHG percentage of total global GHG for the same time period is: 0.00016539%.*

* Global value based on the U.S. emits 13.4% of all global GHG annual emissions (2018 Emissions Data, Center for Climate and Energy Solutions, accessed 7-6-2023, https://www.c2es.org/content/international-emissions).

Climate Change Assessment (as SC GHG):

On a global scale, the potential climate change effects of an action are indirectly addressed and put into context through providing the theoretical SC GHG associated with an action. The SC GHG is an administrative and theoretical tool intended to provide additional context to a GHG's potential impacts through approximating the long-term monetary damage that may result from GHG emissions effect on climate change. It is important to note that the SC GHG is a monetary quantification, in 2020 U.S. dollars, of the theoretical economic damages that could result from emitting GHGs into the atmosphere.

The SC GHG estimates are derived using the methodology and discount factors in the "Technical Support Document: Social Cost of Carbon, Methane, and Nitrous Oxide Interim Estimates under Executive Order 13990," released by the Interagency Working Group on Social Cost of Greenhouse Gases (IWG SC GHGs) in February 2021.

The speciated IWG Annual SC GHG Emission associated with an action (or alternative) are first estimated as annual unit cost (cost per metric ton, $/mton). Results of the annual IWG Annual SC GHG Emission Assessments are tabulated in the IWG Annual SC GHG Cost per Metric Ton Table below:

IWG SC GHG Discount Factor: 2.5%

IWG Annual SC GHG Cost per Metric Ton ($/mton [In 2020 $])

YEAR	CO2	CH4	N2O
2025	$83.00	$2,200.00	$30,000.00
2026	$84.00	$2,300.00	$30,000.00

YEAR	CO2	CH4	N2O
2027 [SS Year]	$86.00	$2,300.00	$31,000.00
2028	$87.00	$2,400.00	$32,000.00
2029	$88.00	$2,500.00	$32,000.00
2030	$89.00	$2,500.00	$33,000.00
2031	$91.00	$2,600.00	$33,000.00
2032	$92.00	$2,600.00	$34,000.00
2033	$94.00	$2,700.00	$35,000.00
2034	$95.00	$2,800.00	$35,000.00
2035	$96.00	$2,800.00	$36,000.00
2036	$98.00	$2,900.00	$36,000.00
2037	$99.00	$3,000.00	$37,000.00
2038	$100.00	$3,000.00	$38,000.00
2039	$102.00	$3,100.00	$38,000.00
2040	$103.00	$3,100.00	$39,000.00
2041	$104.00	$3,200.00	$39,000.00
2042	$106.00	$3,300.00	$40,000.00
2043	$107.00	$3,300.00	$41,000.00
2044	$108.00	$3,400.00	$41,000.00
2045	$110.00	$3,500.00	$42,000.00
2046	$111.00	$3,500.00	$43,000.00
2047	$112.00	$3,600.00	$43,000.00

Action-related SC GHG were estimated by calendar-year for the projected action's lifecycle. Annual estimates were found by multiplying the annual emission for a given year by the corresponding IWG Annual SC GHG Emission value (see table above).

Action-Related Annual SC GHG ($K/yr [In 2020 $])

YEAR	CO2	CH4	N2O	GHG
2025	$1,358.32	$1.39	$13.42	$1,373.12
2026	$5,515.20	$6,648.87	$86,660.75	$98,824.82
2027 [SS Year]	$5,646.51	$6,648.87	$89,549.45	$101,844.83
2028	$5,712.17	$6,937.95	$92,438.14	$105,088.26
2029	$5,777.83	$7,227.03	$92,438.14	$105,443.00
2030	$5,843.48	$7,227.03	$95,326.83	$108,397.35
2031	$5,974.80	$7,516.11	$95,326.83	$108,817.74
2032	$6,040.46	$7,516.11	$98,215.52	$111,772.09
2033	$6,171.77	$7,805.19	$101,104.21	$115,081.18
2034	$6,237.43	$8,094.27	$101,104.21	$115,435.92
2035	$6,303.08	$8,094.27	$103,992.91	$118,390.26
2036	$6,434.40	$8,383.36	$103,992.91	$118,810.66
2037	$6,500.06	$8,672.44	$106,881.60	$122,054.09
2038	$6,565.71	$8,672.44	$109,770.29	$125,008.44
2039	$6,697.03	$8,961.52	$109,770.29	$125,428.83

YEAR	CO2	CH4	N2O	GHG
2040	$6,762.68	$8,961.52	$112,658.98	$128,383.18
2041	$6,828.34	$9,250.60	$112,658.98	$128,737.92
2042	$6,959.66	$9,539.68	$115,547.67	$132,047.01
2043	$7,025.31	$9,539.68	$118,436.36	$135,001.36
2044	$7,090.97	$9,828.76	$118,436.36	$135,356.10
2045	$7,222.28	$10,117.84	$121,325.06	$138,665.18
2046	$7,287.94	$10,117.84	$124,213.75	$141,619.53
2047	$7,353.60	$10,406.92	$124,213.75	$141,974.27

The following two tables summarize the U.S. and State's Annual SC GHG by calendar-year. The U.S. and State's Annual SC GHG are in 2020 dollars and were estimated by each year for the projected action lifecycle. Annual SC GHG estimates were found by multiplying the U.S. and State's annual five-year average GHG emissions for a given year by the corresponding IWG Annual SC GHG Cost per Metric Ton value.

State's Annual SC GHG ($K/yr [In 2020 $])

YEAR	CO2	CH4	N2O	GHG
2025	$8,359,327.40	$1,105,474.62	$865,792.87	$10,330,594.89
2026	$8,460,042.19	$1,155,723.47	$865,792.87	$10,481,558.53
2027 [SS Year]	$8,661,471.77	$1,155,723.47	$894,652.63	$10,711,847.87
2028	$8,762,186.56	$1,205,972.31	$923,512.39	$10,891,671.26
2029	$8,862,901.34	$1,256,221.16	$923,512.39	$11,042,634.90
2030	$8,963,616.13	$1,256,221.16	$952,372.15	$11,172,209.45
2031	$9,165,045.71	$1,306,470.01	$952,372.15	$11,423,887.87
2032	$9,265,760.50	$1,306,470.01	$981,231.92	$11,553,462.42
2033	$9,467,190.07	$1,356,718.85	$1,010,091.68	$11,834,000.60
2034	$9,567,904.86	$1,406,967.70	$1,010,091.68	$11,984,964.24
2035	$9,668,619.65	$1,406,967.70	$1,038,951.44	$12,114,538.79
2036	$9,870,049.22	$1,457,216.55	$1,038,951.44	$12,366,217.21
2037	$9,970,764.01	$1,507,465.39	$1,067,811.20	$12,546,040.61
2038	$10,071,478.80	$1,507,465.39	$1,096,670.96	$12,675,615.16
2039	$10,272,908.38	$1,557,714.24	$1,096,670.96	$12,927,293.58
2040	$10,373,623.16	$1,557,714.24	$1,125,530.73	$13,056,868.13
2041	$10,474,337.95	$1,607,963.09	$1,125,530.73	$13,207,831.76
2042	$10,675,767.53	$1,658,211.93	$1,154,390.49	$13,488,369.95
2043	$10,776,482.32	$1,658,211.93	$1,183,250.25	$13,617,944.50
2044	$10,877,197.10	$1,708,460.78	$1,183,250.25	$13,768,908.13
2045	$11,078,626.68	$1,758,709.63	$1,212,110.01	$14,049,446.32
2046	$11,179,341.47	$1,758,709.63	$1,240,969.78	$14,179,020.87
2047	$11,280,056.26	$1,808,958.47	$1,240,969.78	$14,329,984.50

U.S. Annual SC GHG ($K/yr [In 2020 $])

YEAR	CO2	CH4	N2O	GHG
2025	$426,325,696.86	$56,379,205.70	$45,021,229.08	$527,726,131.63
2026	$431,462,151.04	$58,941,896.86	$45,021,229.08	$535,425,276.98
2027 [SS Year]	$441,735,059.39	$58,941,896.86	$46,521,936.72	$547,198,892.97
2028	$446,871,513.57	$61,504,588.03	$48,022,644.35	$556,398,745.96
2029	$452,007,967.75	$64,067,279.20	$48,022,644.35	$564,097,891.30
2030	$457,144,421.93	$64,067,279.20	$49,523,351.99	$570,735,053.12
2031	$467,417,330.29	$66,629,970.37	$49,523,351.99	$583,570,652.65
2032	$472,553,784.47	$66,629,970.37	$51,024,059.62	$590,207,814.46
2033	$482,826,692.83	$69,192,661.54	$52,524,767.26	$604,544,121.62
2034	$487,963,147.01	$71,755,352.70	$52,524,767.26	$612,243,266.97
2035	$493,099,601.18	$71,755,352.70	$54,025,474.90	$618,880,428.78
2036	$503,372,509.54	$74,318,043.87	$54,025,474.90	$631,716,028.31
2037	$508,508,963.72	$76,880,735.04	$55,526,182.53	$640,915,881.29
2038	$513,645,417.90	$76,880,735.04	$57,026,890.17	$647,553,043.11
2039	$523,918,326.26	$79,443,426.21	$57,026,890.17	$660,388,642.63
2040	$529,054,780.44	$79,443,426.21	$58,527,597.80	$667,025,804.45
2041	$534,191,234.62	$82,006,117.38	$58,527,597.80	$674,724,949.80
2042	$544,464,142.97	$84,568,808.54	$60,028,305.44	$689,061,256.96
2043	$549,600,597.15	$84,568,808.54	$61,529,013.08	$695,698,418.77
2044	$554,737,051.33	$87,131,499.71	$61,529,013.08	$703,397,564.12
2045	$565,009,959.69	$89,694,190.88	$63,029,720.71	$717,733,871.28
2046	$570,146,413.87	$89,694,190.88	$64,530,428.35	$724,371,033.10
2047	$575,282,868.05	$92,256,882.05	$64,530,428.35	$732,070,178.44

Relative Comparison of SC GHG:

To provide additional real-world context to the potential climate change impact associate with an action, a Relative Comparison of SC GHG Assessment is also performed. While the SC GHG estimates capture an indirect approximation of global climate damages, the Relative Comparison of SC GHG Assessment provides a better perspective from a regional and global scale.

The Relative Comparison of SC GHG Assessment uses the rule of reason and the concept of proportionality along with the consideration of the affected area (yGba.e., global, national, and regional) and the SC GHG as the degree (intensity) of the proposed action's effects. The Relative Comparison Assessment provides real-world context and allows for a reasoned choice among alternatives through a relative contrast analysis which weighs each alternative's SC GHG proportionally against (or relative to) existing global, national, and regional SC GHG. The below table provides a relative comparison between an action's SC GHG vs. state and U.S. projected SC GHG for the same time period:

Total SC-GHG ($K [In 2020 $])

		CO2	CH4	N2O	GHG
2025–2047	State Total	$226,104,699.06	$33,465,731.72	$24,184,480.75	$283,754,911.53
2025–2047	U.S. Total	$11,531,339,631.86	$1,706,752,317.89	$1,257,592,998.97	$14,495,684,948.71
2025–2047	Action	$143,309.03	$186,169.69	$2,334,076.41	$2,663,555.13
—	Percent of State Totals	0.06338171%	0.55629948%	9.65113304%	0.93868160%
—	Percent of U.S. Totals	0.00124278%	0.01090783%	0.18559871%	0.01837481%

From a global context, the action's total SC GHG percentage of total global SC GHG for the same time period is: 0.00246223%.*

* Global value based on the U.S. emits 13.4% of all global GHG annual emissions (2018 Emissions Data, Center for Climate and Energy Solutions, accessed 7-6-2023, https://www.c2es.org/content/international-emissions).

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