

DRAFT
DOCUMENT OF ENVIRONMENTAL PROTECTION

ACTIVITY:
NAVY CONVENTIONAL PROMPT STRIKE WEAPON
SYSTEM FLIGHT TESTS

CONTROL NUMBER DEP-24-SMDC-01

February 2025

ACTIVITY LOCATION:
U.S. ARMY KWAJALEIN ATOLL / RONALD REAGAN BALLISTIC
MISSILE DEFENSE TEST SITE
REPUBLIC OF THE MARSHALL ISLANDS

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ACTIVITY: NAVY CONVENTIONAL PROMPT STRIKE WEAPON SYSTEM FLIGHT TESTS

Control Number: DEP-24-SMDC-01

Submitted By: United States Army Space and Missile Defense Command (USASMDC)

Date Submitted: 25 March 2024

Effective Date: TBD (Date of final signature)

Expiration Date: TBD (Five years after final signature)

Type of Activity

This Document of Environmental Protection (DEP) has been prepared for Department of the Navy (Navy) Conventional Prompt Strike (CPS) Weapon System Flight Tests activities within the Republic of the Marshall Islands (RMI). Navy CPS flight test activities in the RMI would consist of terminal impact of flight test payloads in the ocean and on land, as well as flight test support activities.

The Navy CPS Weapon System Flight Tests would consist of conducting Navy CPS weapon system (missile) flight tests in both Atlantic and Pacific Ocean regions. Testing would involve up to eight flight test launches per year from various sea-based launch locations conducted over a 10-year period. All flight tests would be at-sea missile tests launched from existing naval vessels operating in Pacific and Atlantic broad ocean areas (BOAs) outside of the RMI. After launch, flight test activities would include vehicle flight over the Pacific and/or Atlantic Oceans and would involve splashdown of spent boosters and fairings in Pacific and Atlantic BOAs. Navy CPS flight test payloads would impact at target sites in the BOAs and within the RMI.

Location of Activity

Within the RMI, the activity would be located at the Ronald Reagan Ballistic Missile Defense Test Site (RTS) within the United States Army Kwajalein Atoll (USAKA). Flight test payloads would impact at target sites within the deep-water Kwajalein Missile Impact Scoring System (KMISS) range and on Illeginni Islet. Flight test support activities such as vessel traffic and human activity would occur at RTS as well as travel routes between those test sites and Kwajalein Harbor at Kwajalein Islet.

Compliance Status

The Compact of Free Association between the RMI and the United States, as amended, at Section (§) 161(a)(i) requires all U.S. Government activities at U.S. Army Garrison–Kwajalein Atoll (USAG-KA) controlled sites (known as USAKA), where RTS is a tenant organization, to conform to specific compliance requirements, coordination procedures, and environmental standards identified in the *Environmental Standards and Procedures for United States Army Kwajalein Atoll (USAKA) Activities in the Republic of the Marshall Islands* (hereafter referred to as the UES), 17th Edition (USASMDC 2024). As specified in UES § 2-2, these standards also apply to all USAG-KA and RTS activities occurring elsewhere within the RMI, including the territorial waters of the RMI.

This DEP has been prepared to support USAG-KA, USASMDC, and Navy compliance requirements under the UES 17th edition (USASMDC 2024) according to standards of UES § 2-18.3.6. The Navy CPS activity would be conducted in compliance with this DEP and with all other applicable requirements of the UES as appropriate.

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Acronyms and Abbreviations

Acronym / Abbreviation	Definition
§	Section
BOA	Broad Ocean Area
CPS	Conventional Prompt Strike
DEP	Document of Environmental Protection
DON	Department of the Navy
EA	Environmental Assessment
KMISS	Kwajalein Missile Impact Scoring System
NMFS	National Marine Fisheries Service
NPA	Notice of Proposed Activity
OEA	Overseas Environmental Assessment
RMI	Republic of the Marshall Islands
RMIEPA	Republic of the Marshall Islands Environmental Protection Authority
RTS	Ronald Reagan Ballistic Missile Defense Test Site
UES	Environmental Standards and Procedures for United States Army Kwajalein Atoll (USAKA) Activities in the Republic of the Marshall Islands
U.S.	United States
USACE	United States Army Corps of Engineers
USAG-KA	United States Army Garrison – Kwajalein Atoll
USAKA	United States Army Kwajalein Atoll
USASMDC	United States Army Space and Missile Defense Command
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service

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1.0 Notice of Proposed Activity Information

The *Environmental Standards and Procedures for United States Army Kwajalein Atoll (USAKA) Activities in the Republic of the Marshall Islands* (hereafter referred to as the UES), 17th Edition (USASMDC 2024) Section (§) 2-18.3.6(a)(1) requires that a Document of Environmental Protection (DEP) include “(t)he relevant information required by Section 2-18.3.2 for an NPA” or Notice of Proposed Activity.

The United States Army Space and Missile Defense Command (USASMDC) assisted the Department of the Navy (Navy or DON) Strategic Systems Programs, the Action Proponent, in environmental compliance for the proposed Navy Conventional Prompt Strike (CPS) Weapon System Flight Tests program which includes activities at USAKA in the Republic of the Marshall Islands (RMI). The Action Proponent, in cooperation with USASMDC, determined that proposed activities at Kwajalein Atoll had the potential to affect the USAKA environment and would therefore require a DEP and an NPA under the UES.

USASMDC submitted an NPA for the Navy CPS Weapon System Flight Tests activity to UES Appropriate Agencies (i.e., RMI Environmental Protection Authority [RMIEPA], National Marine Fisheries Service [NMFS], U.S. Fish and Wildlife Service [USFWS], U.S. Environmental Protection Agency [USEPA], and U.S. Army Corps of Engineers [USACE]) on May 30, 2024. The Navy CPS NPA consisted of the *Navy CPS Weapon System Flight Tests Draft Environmental Assessment (EA) / Overseas Environmental Assessment (OEA)* and the *Navy CPS Weapon System Flight Tests Biological Assessment for Activities at Kwajalein Atoll*, which included all relevant information required by UES § 2-18.3.2. The Draft EA/OEA also served as a preliminary review and notification under UES § 3-4.6.3. The Navy CPS Weapon System Flight Tests Final EA/OEA is included in **Appendix A** of this DEP to meet requirements of UES § 2-18.3.6(a)(1) as detailed in **Table 1.0**.

The *Navy CPS Weapon System Flight Tests Biological Assessment for Activities at Kwajalein Atoll* (DON and USASMDC 2023) was submitted to USFWS and NMFS by USASMDC and the Navy with a request for initiation of consultation as required under UES § 3-4.5.3 on December 8, 2023. NMFS issued a Biological Opinion for the Navy CPS Weapon System Flight Tests action in November 2024 which fulfilled requirements of UES § 3-4.5. The Navy CPS Biological Assessment and Biological Opinion are available from USASMDC upon request.

As required under UES § 2-18.3.5, the UES Appropriate Agencies reviewed the NPA and provided environmental comments and recommendations within 90 days of receipt of the NPA. All environmental comments and recommendations received from UES Appropriate Agencies are provided in **Section 6.0** of this DEP.

Table 1.0. Details of NPA Information Requirements Fulfillment for the Proposed Activity

UES § 2-18.3.2 Part	Description of NPA Requirement	Status or Location in the Navy CPS Flight Tests Final EA/OEA		
		EA/OEA Volume	Section(s)	Page(s)
(a)	Type of activity.	Volume 1	2.1	2-1
(b)	Location of activity.	Volume 1	2.1.4.3 & 2.1.4.4	2-10 to 2-12
(c)	Technical description of the activity, including the chemical processes used.	Volume 1	2.1	2-1 to 2-16
(d)	Technical drawing of the activity, including schematics.	Volume 1	2.1	2-1 to 2-16
(e)	Environmental areas potentially affected by the activity (air, water, hazardous waste, pesticides, cultural resources, etc.).	Volume 1	1.6	1-7 to 1-10
(f)	Description of the environmental setting of the activity.	Volume 1	3.2	3-22 to 3-43
(g)	Analysis of the effect of the activity on the environmental area in the absence of environmental controls.	Volume 1	4.2.2 & 4.3.2.2	4-12 to 4-25, 4-31 to 4-36
		Volume 2	D.2	D-20 to D-30
(h)	Technical description and analysis of the environmental controls used in the activity.	Volume 2	Appendix C	C-1 to C-11
(i)	Dispersion model for modeling air sources.	Not Applicable – The proposed activity does not involve construction or operation of new or major stationary air pollution sources which would require dispersion modeling. Additional air quality impact analyses are found within the EA/OEA in:		
		Volume 1	4.2.2.1	4-12 to 4-13
(j)	Analysis of waste discharge for point-source waste discharges to water (UES § 3-2.7.1).	Not Applicable – The proposed activity does not involve point-source waste discharges as defined in the UES.		
(k)	Information required under UES § 3-6.5.3 and 3-6.5.7 for treatment, storage, or disposal facilities.	Volume 1	3.2.6.2 & 4.2.2.6	3-40, 4-21 to 4-23
(l)	Biological assessment [UES § 3-4.5.3(c)] if endangered resources may be affected.	<i>In the Navy CPS Weapon System Flight Tests Biological Assessment for Activities at Kwajalein Atoll, which was included in the NPA submission.</i>		
(m)	Information on receiving-water quality for water discharges.	Volume 1	4.2.2.5	4-20 to 4-21

UES § 2-18.3.2 Part	Description of NPA Requirement	Status or Location in the Navy CPS Flight Tests Final EA/OEA		
		EA/OEA Volume	Section(s)	Page(s)
(n)	Information on marine life, currents, and other characteristics of an ocean disposal site (UES §§ 3-4 and 3-5).	Not Applicable – The proposed activity does not include direct or secondary ocean disposal of wastes. Material and debris resulting from routine tests conducted at or near USAG-KA are not considered ocean disposal under the standards of UES §3-5.5.5(a)(3). Similarly, routine discharges of effluent incidental to the propulsion of vessels or the operation of motor-driven equipment on vessels is not considered ocean disposal under the standards of UES §3-5.5.5(a)(1).		
(o)	Information on marine life and environment in areas where dredging or filling will take place (UES §§ 3-2, 3-4, and 3-5).	Not Applicable – No ocean dredging or filling will take place for proposed test flight activities.		
(p)	Species and numbers of migratory birds and other wildlife species and habitats that may be affected (UES § 3-4.6.3(c), UES Appendix 3-4C and UES Appendix 3-4D).	Volume 1	3.2.3 & 4.2.2.3	3-24 to 3-35, 4-13 to 4-18
		Volume 2	D.2	D-20 to D-30
(q)	Analysis of climate change and its potential impacts on the activity, and a description of related limitations and requirements.	Volume 1	3.2.1, 4.2.2.1, & 4.3.2.2	3-22 to 3-23, 4-12 to 4-13, 4-31 to 4-36
		Additional analysis of the cumulative effects of climate change on biological resources can be found in Section 5.0, pages 61 to 65 of the <i>Navy CPS Weapon System Flight Tests Biological Assessment for Activities at Kwajalein Atoll</i> , which was included in the NPA submission.		
(r)	Analysis of the effect of the proposed activity and associated mitigation measures on communities with environmental justice concerns, including Indigenous communities, and a description of related limitations and requirements.	Volume 1	3.2.7, 4.2.2.7, & 4.3.2.2	3-41 to 3-42, 4-24, & 4-36

Acronyms and Abbreviations:

CPS = Conventional Prompt Strike, EA/OEA = Environmental Assessment / Overseas Environmental Assessment, NPA = Notice of Proposed Activity, UES = USAKA Environmental Standards, USAG-KA = United States Army Garrison-Kwajalein Atoll

2.0 Requirements and Limitations

UES § 2-18.3.6(a)(4) requires that a DEP include a description of any specific limitations or requirements in the UES standards that are applicable to the activity. This section includes best management practices and standard operating procedures which would be implemented as part of the Navy CPS Weapon System Flight Tests activity to ensure safe operations, protection of the environment, and compliance with UES standards. This section does not include required monitoring procedures (see **Section 3.0**), notification and reporting procedures (see **Section 4.0**), or recordkeeping procedures (see **Section 5.0**) as these requirements are detailed elsewhere in the document.

Responsible parties for requirements include the Defense Program (Navy), USASMDC Office of the Deputy Chief of Staff, Engineer Environmental Division (ENV), USASMDC Ronald Reagan Ballistic Missile Defense Test Site (RTS), and the United States Army Garrison – Kwajalein Atoll (USAG-KA).

2.1 General Requirements and Limitations

General requirements and limitations for all Navy CPS Flight Tests activities at Kwajalein Atoll are listed in **Table 2.1**. This table also indicates the timeframe of the requirement as well as the responsible party.

Table 2.1. General Requirements and Limitations

Number	Requirement or Limitation	Timeframe	Responsible Party
2.1(a)	Test personnel would be briefed on Best Management Practices and requirements and the requirement to adhere to them during test activities.	Prior to flight test activities	USASMDC RTS
2.1(b)	Prior to flight testing, the Action Proponents would prepare a detailed cleanup plan that satisfies human health and safety requirements and incorporates measures to minimize ocean pollution.	Prior to flight test activities at USAKA	Defense Program
2.1(c)	Equipment and packages/materials shipped from the United States to RTS shall be inspected and washed if necessary to prevent the introduction of animals, plants, and seeds.	Prior to equipment transport to RTS	Defense Program & USASMDC RTS
2.1(d)	Publish Notices to Air Missions (NOTAM) and Notices to Mariners (NTM) to clear commercial, private, and non-mission military vessel and aircraft traffic from caution areas ahead of any flight test.	Prior to flight test	USASMDC RTS
2.1(e)	Nonessential personnel would be evacuated from the Mid-Atoll Corridor as necessary, and the area would be monitored for unauthorized access.	Prior to flight test event	USASMDC RTS
2.1(f)	All materials or equipment placed in the water for temporary use would be removed as soon as possible after use or at the end of proposed activities.	After a flight test	Defense Program & USASMDC RTS

Number	Requirement or Limitation	Timeframe	Responsible Party
2.1(g)	Following a flight test, visible debris on the surface of the water would be recovered and properly disposed of according to UES § 3-6 standards and the currently effective Solid Waste Disposal DEP (USAG-KA 2019).	After a flight test	Defense Program & USASMDC RTS
2.1(h)	Prior to returning the test support equipment and materials to the United States, the equipment would be inspected and washed, if necessary, to ensure that it does not contain any animals, plants, or seeds. If washing takes place on Illeginni Islet, personnel would be judicious and not overwater, to ensure the freshwater would evaporate in place and not flow into the lagoon. This would prevent possible contamination from entering the marine environment.	After flight test and prior to material shipment to United States	Defense Program, & USASMDC RTS
2.1(i)	If previously unidentified cultural features, significant artifacts, or human remains are discovered during the activities, work shall cease, and the USAG-KA Environmental Office shall be notified as required in UES § 3-7.5.7(a) and according to procedures in the currently effective Protection of Cultural Resources DEP (USAG-KA 2022).	During all activities	Defense Program, & USASMDC RTS
2.1(j)	Any necessary dredge and fill activities would be carried out only after consultations with UES Appropriate Agencies and USAG-KA and in accordance with requirements and best management practices specified in UES § 3-2.7.2 and the currently effective USAG-KA Dredge and Fill DEP.	Conditional – in the event dredging and filling were required	USASMDC RTS
2.1(k)	Reinitiation of consultation with the NMFS is required if: <ul style="list-style-type: none"> • The amount or extent of incidental take of UES or ESA-listed species exceeds those specified in Section 8.1 of the NMFS Biological Opinion (NMFS 2024); • New information reveals effects of the activity that may affect listed species or critical habitat in a manner or to an extent not previously considered; • The activity is modified in a manner that causes an effect to listed species or critical habitat that was not considered in the NMFS Biological Opinion (NMFS 2024); or • A new species is listed or critical habitat is designated that may be affected by the activity. 	Conditional, During all activities	USASMDC ENV

Acronyms and Abbreviations:

DEP = Document of Environmental Protection, ENV = Environmental, NMFS = National Marine Fisheries Service, RTS = Ronald Reagan Ballistic Missile Defense Test Site, UES = USAKA Environmental Standards, USAG-KA = United States Army Garrison–Kwajalein Atoll, USAKA = United States Army Kwajalein Atoll, USASMDC = United States Army Space and Missile Defense Command

2.2 Vessel and Equipment Operations Requirements and Limitations

Requirements and limitations for Navy CPS Flight Test-related vessel, aircraft, and equipment operations at Kwajalein Atoll are listed in **Table 2.2**.

Table 2.2. Vessel and Equipment Operations Requirements and Limitations

Number	Requirement or Limitation	Timeframe	Responsible Party
2.2(a)	Vessel and heavy equipment operators would inspect and clean equipment for fuel or fluid leaks prior to use or transport and would not intentionally discharge fuels or waste materials into terrestrial or marine environments.	Prior to vessel and equipment use or transport	USASMDC RTS & USAG-KA
2.2(b)	During travel to and from payload impact zones, including Illeginni Islet, ship personnel would monitor for marine mammals and sea turtles to avoid potential ship strikes. Vessel operators would adjust speed or raft deployment based on the presence of special-status species and on lighting and turbidity conditions. Any opportunistic marine mammal or sea turtle sighting, or lack of observations, would be recorded and reported according to procedures in Monitoring Requirement 3.1(e) and Reporting Requirements 4.0(a) and 4.0(b) .	During all test-related vessel operations	USASMDC RTS, & USAG-KA
2.2(c)	Any accidental spills from support equipment operations would be contained and cleaned up and all waste materials would be transported to Kwajalein Islet for proper disposal.	During all test-related activities	Defense Program, USASMDC RTS, & USAG-KA
2.2(d)	Response to releases of oil, fuels, and lubricants into the USAKA environment would be in accordance with the <i>Kwajalein Environmental Emergency Plan</i> (UES § 3 6.5.8).	During all test-related activities	USASMDC RTS & USAG-KA

Acronyms and Abbreviations:

RTS = Ronald Reagan Ballistic Missile Defense Test Site, UES = USAKA Environmental Standards, USAG-KA = United States Army Garrison–Kwajalein Atoll, USAKA = United States Army Kwajalein Atoll, USASMDC = United States Army Space and Missile Defense Command

2.3 Requirements and Limitations at Ocean Target Site (KMISS)

For flight tests utilizing the ocean target site at KMISS, applicable requirements and limitations would include the general requirements listed in **Table 2.1**, vessel and equipment requirements listed in **Table 2.2**, and the KMISS-specific requirements listed in **Table 2.3**.

Table 2.3. Requirements and Limitations at Ocean Target Site (KMISS)

Number	Requirement or Limitation	Timeframe	Responsible Party
2.3(a)	Following assessment of the impact area for safety, personnel would search for any visible floating debris. Any visible test debris found floating would be recovered, as much as practicable, and would be properly disposed of according to UES § 3-6 standards and the currently effective Solid Waste Disposal DEP (USAG-KA 2019).	After flight test	Defense Program, USASMDC RTS

Acronyms and Abbreviations:

DEP = Document of Environmental Protection, RTS = Ronald Reagan Ballistic Missile Defense Test Site, UES = USAKA Environmental Standards, USASMDC = United States Army Space and Missile Defense Command

2.4 Requirements and Limitations at Land Target Site (Illeginni Islet)

For flight tests utilizing the land target site at Illeginni Islet, applicable requirements and limitations would include the general requirements listed in **Table 2.1**, vessel and equipment requirements listed in **Table 2.2**, and the Illeginni Islet-specific requirements listed in **Table 2.4**.

Table 2.4. Requirements and Limitations at Land Target Site (Illeginni Islet)

Number	Requirement or Limitation	Timeframe	Responsible Party
2.4(a)	Prior to flight test activities, Illeginni Islet would be assessed to ensure all personnel are off-site prior to launch and exclusionary control (keeping personnel out of the impact zone) would be maintained until recovery actions are complete.	Prior to and during flight test	USASMDC RTS
2.4(b)	To avoid impacts on coral heads in waters near Illeginni Islet, sensor rafts would be located in waters at least 10 feet deep.	Prior to and during flight test	USASMDC RTS
2.4(c)	To prevent birds from nesting on support equipment after initial setup, the equipment would be appropriately covered with tarps or other materials and "scare" techniques (e.g., scarecrows, mylar ribbons, and/or flags) would be used on or near the equipment.	Prior to flight test and throughout equipment mobilization	USASMDC RTS
2.4(d)	Prior to debris recovery and cleanup actions on Illeginni Islet, unexploded ordnance personnel would first inspect the impact site and surrounding area and clear the target site for safe entry by test personnel.	After flight test	USASMDC RTS
2.4(e)	Debris recovery and site cleanup would be performed for a land impact test. To minimize long-term risks to marine life, all visible project-related man-made debris would be recovered during post-flight operations (including in waters less than 180 feet deep). In all cases, recovery and cleanup would be conducted in a manner to minimize further impacts on biological resources.	After flight test	Defense Program & USASMDC RTS
2.4(f)	The impact area would be wetted with freshwater as necessary to stabilize the disturbed soil during cleanup and recovery activities.	After flight test	Defense Program & USASMDC RTS
2.4(g)	During post-test recovery and cleanup, should personnel observe highly mobile endangered, threatened, or other species requiring consultation moving into the area, work would be delayed until such species are out of harm's way or leave the area of their own volition.	After flight test	Defense Program, USASMDC RTS
2.4 (h)	Following debris removal, the impact crater would be backfilled and, if necessary, repairs made to surrounding structures.	After flight test	Defense Program & USASMDC RTS
2.4(i)	Project personnel would avoid activities that would negatively affect the National Register Cold War era properties located on the middle and eastern end of the islet.	During all activities	Defense Program, & USASMDC RTS

Acronyms and Abbreviations:

RTS = Ronald Reagan Ballistic Missile Defense Test Site, USASMDC = United States Army Space and Missile Defense Command

2.4.1 Requirements in the Event of Reef or Shallow Water Impacts

Shoreline or shallow water payload impacts are not planned or expected as part of Navy CPS Flight Tests. However, since this Navy CPS Weapon System is an experimental weapon system, environmentally protective requirements and procedures which would be implemented in the event of shallow water or reef impacts (including debris entering these areas) are detailed in this DEP.

As detailed in **Section 3.3**, an inspection would be made as soon as practicable after a land impact test to determine reef habitats were affected by the test. If any inadvertent impacts on the reef, reef flat, or in shallow waters less than 10 feet deep (including debris entering these areas) occur, then the requirements in **Table 2.4.1** and monitoring procedures in **Table 3.3.1** would apply in addition to standard requirements for flight tests utilizing the Illeginni Islet target site.

Table 2.4.1. Requirements and Limitations in the Event of Reef or Shallow Water Impacts

Number	Requirement or Limitation	Timeframe	Responsible Party
2.4.1(a)	If any man-made debris were to enter the marine environment and divers were required to search for payload debris on the adjacent reef flat, they would be briefed prior to operations about coral fragility and provided guidance on how to carefully retrieve the very small pieces of payload debris that they would be looking for.	Conditional, After flight test	USASMDC RTS
2.4.1(b)	<p>In the event of a payload impact that affects the reef at Illeginni Islet, personnel would secure or remove from the water any substrate or coral rubble from the ejecta impact area that may become mobilized by wave action.</p> <ul style="list-style-type: none"> Ejecta greater than 6 inches in any dimension would be removed from the water or positioned such that it would not become mobilized by expected wave action, including replacement in the payload crater. If possible, coral fragments greater than 6 inches in any dimension would be positioned on the reef such that they would not become mobilized by expected wave action and in a manner that would enhance their survival (i.e., away from fine sediments with the majority of the living tissue [polyps] facing up). UES consultation coral fragments that could not be secured in-place would be relocated to suitable habitat where they are not likely to become mobilized. 	Conditional, After flight test	USASMDC RTS
2.4.1(c)	<p>In the event of a payload impact that affects the reef at Illeginni Islet, impacts on top shell snails and clams would be reduced.</p> <ul style="list-style-type: none"> Any living top shell snails or clams that are buried or trapped by rubble would be rescued and repositioned. Any living top shell snails or clams that are in the path of any heavy equipment that must be used in the marine environment would be relocated to suitable habitat. 	After flight test	USASMDC RTS

Acronyms and Abbreviations: RTS = Ronald Reagan Ballistic Missile Defense Test Site, UES = USAKA Environmental Standards, USASMDC = United States Army Space and Missile Defense Command

3.0 Monitoring Procedures

UES § 2-18.3.6(a)(2) requires that a DEP include a description of any specific monitoring associated with the activity. This section includes monitoring procedures which would be implemented as part of the Navy CPS Weapon System Flight Tests activity to ensure safe operations, protection of the environment, and compliance with UES standards. This section does not include notification and reporting procedures (see **Section 4.0**) or recordkeeping procedures (see **Section 5.0**) associated with monitoring, as these requirements are detailed elsewhere in the document.

Responsible parties for monitoring requirements include the Defense Program (Navy), USASMDC RTS, and USAG-KA.

3.1 General Monitoring Procedures

General monitoring procedures for all Navy CPS Flight Tests activities at Kwajalein Atoll are listed in **Table 3.1**. This table also indicates the timeframe of the monitoring requirement as well as the responsible party.

Table 3.1. General Monitoring Procedures

Number	Monitoring Requirement	Timeframe	Responsible Party
3.1(a)	A helicopter or fixed-wing aircraft overflight in the vicinity of the KMISS or Illeginni Islet impact area would be conducted during the week prior to the test and as close to launch as safely practical to survey for marine mammals and sea turtles. All findings (including sightings or the lack of sightings) would be recorded and reported according to procedures detailed in Monitoring Requirement 3.1(e) and Reporting Requirements 4.0(a) and 4.0(b) .	Week prior to flight test	USASMDC RTS & USAG-KA
3.1(b)	As necessary for a mid-atoll corridor closure, the closed area would be monitored for unauthorized access and cleared of unauthorized personnel.	Prior to flight test	USASMDC RTS & USAG-KA
3.1(b)	Any marine mammals or sea turtle opportunistic sightings collected during ship travel, overflights, and deployment of sensor rafts in the vicinity of the Illeginni Islet or KMISS impact areas would be recorded and reported according to procedures detailed in Monitoring Requirement 3.1(e) and Reporting Requirements 4.0(a) and 4.0(b) .	During all test-related activities	USASMDC RTS & USAG-KA
3.1(c)	Post-test overflights of the impact area would be conducted to survey for dead or injured cetaceans and sea turtles. All findings (including sightings or lack of sightings) would be recorded and reported immediately according to procedures detailed in Monitoring Requirements 3.1(e) and 3.1(g) and Reporting Requirements 4.0(c) and 4.0(d) .	When feasible, within 1 day after a flight test	USASMDC RTS & USAG-KA

Number	Monitoring Requirement	Timeframe	Responsible Party
3.1(d)	Although unlikely, any incidental sightings of dead or injured marine mammals or sea turtles by project personnel would be recorded and reported immediately to the USASMDC Environmental Division and the USAG-KA Environmental Office according to Reporting Requirements 4.0(c) and 4.0(d) . Observation records would include all information required in Monitoring Requirements 3.1(e) and 3.1(g) . USAG-KA aircraft pilots or vessel operators otherwise operating in the vicinity of the impact and test support areas would also record and report any opportunistic sightings of dead or injured marine mammals or sea turtles according to these procedures.	After flight test	Defense Program, USASMDC RTS, & USAG-KA
3.1(e)	For all surveys and incidental observations, data would be recorded including: <ul style="list-style-type: none"> • Location of survey and observations • Date of survey • Time of survey and observations • Species observed • Number of individuals • Photographs (if possible) • Or reports of no sightings when animals are not seen on surveys. Observations would be reported as in Reporting Requirements 4.0(a) and 4.0(b) .	After flight test	USASMDC RTS & USAG-KA
3.1(f)	Appropriately trained and qualified personnel would be assigned to record all suspected incidences of take of any UES-consultation species.	After flight test	USASMDC RTS
3.1(g)	In the event that any UES consultation species is found injured or killed, the finding would be recorded using digital photography. As practicable, digital photographic records would include: <ul style="list-style-type: none"> • Photographs of all damaged corals or other UES consultation species observed injured or dead; • A scaling device (such as a ruler) in photographs to aid in the determination of size; and • The GPS location of the photograph. Any photographs or records of injured or killed UES consultation species would be reported as in Reporting Requirements 4.0(c) , 4.0(e) , and 4.0(g) .	Conditional – Only in the event consultation species are found injured or killed; After a flight test	USASMDC RTS

Acronyms and Abbreviations:

KMISS = Kwajalein Missile Impact Scoring System, NMFS = National Marine Fisheries Service, RMIEPA = Republic of the Marshall Islands Environmental Protection Authority, RTS = Ronald Reagan Ballistic Missile Defense Test Site, UES = USAKA Environmental Standards, USAG-KA = United States Army Garrison–Kwajalein Atoll, USASMDC = United States Army Space and Missile Defense Command, USFWS = United States Fish and Wildlife Service

3.2 Monitoring Procedures at Ocean Target Site (KMISS)

For flight tests utilizing the ocean target site at KMISS, applicable monitoring procedures would include the general monitoring procedures listed in **Table 3.1** and the KMISS-specific requirements listed in **Table 3.2**.

Table 3.2. Monitoring Procedures at Ocean Target Site (KMISS)

Number	Monitoring Requirement	Timeframe	Responsible Party
3.2(a)	Following completion of a flight test at KMISS, a vessel or aircraft from USAG-KA would inspect the ocean impact area for any floating debris. Any visible debris found floating would be recovered, as much as practicable.	After flight test	USASMDC RTS & USAG-KA

Acronyms and Abbreviations:

KMISS = Kwajalein Missile Impact Scoring System, RTS = Ronald Reagan Ballistic Missile Defense Test Site, USAG-KA = United States Army Garrison-Kwajalein Atoll, USASMDC = United States Army Space and Missile Defense Command

3.3 Monitoring Procedures at Land Target Site (Illeginni Islet)

For flight tests utilizing the land target site at Illeginni Islet, applicable monitoring procedures would include the general monitoring procedures listed in **Table 3.1** and the Illeginni Islet-specific requirements listed in **Table 3.3**.

Table 3.3. Monitoring Procedures at Land Target Site (Illeginni Islet)

Number	Monitoring Requirement	Timeframe	Responsible Party
3.3(a)	Pre-flight test monitoring by qualified personnel would be conducted on Illeginni Islet for sea turtles or sea turtle nests. For at least 8 weeks preceding the launch, Illeginni Islet would be surveyed weekly by pre-test personnel for sea turtles, sea turtle nesting activity, and sea turtle nests. If possible, personnel would inspect the area within days of the launch. Sea turtles or sea turtle nest observations near the impact area or the lack of observations would be recorded and reported according to procedures detailed in Monitoring Requirement 3.1(e) and Reporting Requirements 4.0(a) and 4.0(b) .	Weekly for at least 8 weeks prior to test	USASMDC RTS
3.3(b)	At Illeginni Islet, searches would be conducted for black-naped tern nests and chicks prior to any pre-test equipment mobilization. Any discovered nests in the action area would be flagged with a stake 3 feet from the nest to prevent disturbance. Prior to the test, nests in the impact area may be covered with A-frame structures as per current USFWS guidance.	Prior to equipment mobilization and prior to flight test	USASMDC RTS
3.3(c)	When feasible, within 1 day after the land impact test at Illeginni Islet, RTS environmental staff would survey the islet and the near-shore waters for any injured wildlife, damaged coral, or damage to sensitive habitats (i.e., reef habitat and sea turtle nesting habitat). Any impacts to biological resources or observation of no impact would be recorded and reported	When feasible, within 1 day after land impact test	USASMDC RTS

Number	Monitoring Requirement	Timeframe	Responsible Party
	<p>according to Monitoring Requirements 3.1(e) (as applicable) and Reporting Requirements 4.0(e) and 4.0(f).</p> <p>If inspection reveals impacts to the reef, reef flat, or shallow waters less than 10 feet deep, the requirements in Table 2.4.1 and Table 3.3.1 (<i>Requirements and Monitoring Procedures for a Reef or Shallow Water Impact</i>) should also be implemented, as applicable.</p> <p>If the inspection reveals injured or killed UES consultation species, the findings should be recorded and reported according to requirement Monitoring Requirement 3.1(g).</p>		
3.3(d)	<p>Following a land-impact test, soil and groundwater samples would be collected at various locations around the impact site and samples would be tested for metals (not limited to, but including arsenic, barium, cadmium, chromium, and lead). Sampling, testing, and analyses would be conducted as detailed in the Illeginni Islet Soil and Water Sampling Plans (USASMDC 2025a, USASMDC 2025b).</p> <p>Testing results exceeding the UES standards would trigger an immediate investigation of the soil or groundwater on Illeginni Islet, as detailed in the UES § 3-6.5.8. Coordination would be initiated with the Defense Program, USASMDC, RMIEPA, and the other UES Appropriate Agencies to determine the scope and methods/procedures to be followed during the investigation and any subsequent soil removal or other remediation activities.</p>	After test	USASMDC RTS & USASMDC ENV

Acronyms and Abbreviations:

ENV = Environmental, RMIEPA = Republic of the Marshall Islands Environmental Protection Authority, RTS = Ronald Reagan Ballistic Missile Defense Test Site, UES = USAKA Environmental Standards, USASMDC = United States Army Space and Missile Defense Command, USFWS = United States Fish and Wildlife Service

3.3.1 Monitoring Procedures in the Event of Reef or Shallow Water Impacts

As detailed in **Section 3.3**, an inspection would be made as soon as practicable after a land impact test to determine reef habitats were affected by the test. If any inadvertent impacts on the reef, reef flat, or in shallow waters less than 10 feet deep (including debris entering these areas) occur, then the requirements in **Table 2.4.1** and monitoring procedures in **Table 3.3.1** would apply in addition to standard procedures for flight tests utilizing the Illeginni Islet target site.

Table 3.3.1. Monitoring Procedures in the Event of Reef or Shallow Water Impacts

Number	Monitoring Requirement	Timeframe	Responsible Party
3.3.1(a)	<p>If an inadvertent impact occurs on the reef, reef flat, or in shallow waters less than 10 feet deep, an inspection by project personnel would occur within 24 hours. Impacts to biological resources would be recorded according to Monitoring Requirements 3.3(c) and 3.1(g). Notification would be made according to Reporting Requirements 4.0(e) and 4.0(f).</p>	Conditional, After flight test and within 24 hours	Defense Program & USASMDC RTS

Number	Monitoring Requirement	Timeframe	Responsible Party
3.3.1(b)	If any man-made debris were to enter the marine environment and divers were required to search for payload debris on the adjacent reef flat, they would be briefed prior to operations about coral fragility and provided guidance on how to carefully retrieve the very small pieces of payload debris that they would be looking for.	Conditional, After flight test and during cleanup and recovery operations	Defense Program, USASMDC RTS, & USAG-KA

Acronyms and Abbreviations:

RTS = Ronald Reagan Ballistic Missile Defense Test Site, USAG-KA = United States Army Garrison–Kwajalein Atoll, USASMDC = United States Army Space and Missile Defense Command

4.0 Notification and Reporting Procedures

UES § 2-18.3.6(a)(2) and (4) require that a DEP include a description of any specific notification and reporting associated with the activity as well as a description of how notification and reporting requirements will be met. **Table 4.0** includes the notification and reporting procedures which would be implemented as part of the Navy CPS Weapon System Flight Tests activity as well as the party responsible for the notification or reporting and the party which would receive the report or notification. This section does not include the associated monitoring procedures (see **Section 3.0**) or recordkeeping procedures (see **Section 5.0**) as these requirements are detailed elsewhere in the document.

Responsible parties for notification and reporting requirements include the Defense Program (Navy), USASMDC ENV, USASMDC RTS, and USAG-KA.

Table 4.0. Notification and Reporting Procedures

Number	Notification or Reporting Requirement	Timeframe	Responsible Reporting Party	Party to Receive Report
4.0(a)	For all biological monitoring surveys and incidental observations, recorded data (see Monitoring Requirement 3.1(e)) on observations would be reported to USASMDC Environmental Division, the USAG-KA Environmental Office, the RTS Range Directorate, and the Flight Test Operations Director.	Within 1 month of each flight test	USASMDC RTS & USAG-KA	USASMDC ENV, USAG-KA ENV, RTS Range Directorate, & Flight Test Operations Director
4.0(b)	For all biological monitoring surveys and incidental observations, USASMDC Environmental Division would distribute survey reports (that meet Monitoring Requirement 3.1(e)), to the RMIEPA, NMFS, and/or the USFWS within 6 months of completion of each fiscal year. This requirement may be met by annual reporting required in Reporting Requirement 4.0(i) .	Within 6 months of completion of each fiscal year	USASMDC ENV	RMIEPA, NMFS, USFWS

Number	Notification or Reporting Requirement	Timeframe	Responsible Reporting Party	Party to Receive Report
4.0(c)	Any dead or injured marine mammals or sea turtles sighted by project or RTS personnel would be reported immediately to the USASMDC Environmental Division and the USAG-KA Environmental Office. Observation records would include all information required in Monitoring Requirements 3.1(d) and 3.1(g) , as applicable.	Conditional – immediately upon sighting of dead or injured marine mammal or sea turtle	Defense Program, USASMDC RTS, & USAG-KA	USASMDC ENV & USAG-KA ENV
4.0(d)	If dead or injured marine mammals or sea turtles are reported, USASMDC Environmental Division would as soon as possible, and within 24 hours, inform the RMIEPA, NMFS, and USFWS.	Conditional – within 24 hours of receiving report of dead or injured marine mammal or sea turtle	USASMDC ENV	RMIEPA, NMFS, USFWS
4.0(e)	Any injured wildlife, damaged corals, or damage to sensitive habitats (i.e., reef habitat and sea turtle nesting habitat) after a land impact test at Illeginni Islet would be reported to USASMDC Environmental Division within 1 day after land impact tests according to Monitoring Requirements 3.1(e) and 3.1(g) . If no impacts to biological resources are observed, that result should be reported to USASMDC Environmental Division.	When feasible, within 1 day after land impact test at Illeginni Islet	USASMDC RTS	USASMDC ENV
4.0(f)	If any injured wildlife, damaged corals, or damage to sensitive habitats (i.e., reef habitat and sea turtle nesting habitat) is recorded after a land impact test at Illeginni Islet, USASMDC Environmental Division would notify UES Appropriate Agencies and offer RMIEPA, NMFS, and USFWS the opportunity to inspect the impact area to provide guidance on response or mitigation measures that may be required.	Conditional – Within 24 hours of receiving report of injured wildlife or damaged habitats at Illeginni Islet	USASMDC ENV	RMIEPA, NMFS & USFWS
4.0(g)	In the event that any UES consultation species is found injured or killed, any photographs or records of injured or killed UES consultation species (meeting Monitoring Requirements 3.1(g)) would be reported to USFWS, RMIEPA, and NMFS via USASMDC Environmental Division within 60 days of completing post-test clean-up operations.	Conditional – If dead or injured consultation species found; Within 60 days of completing post-test clean-up operations at Illeginni Islet	USASMDC ENV	RMIEPA, NMFS, & USFWS
4.0(h)	USASMDC Environmental Division shall report to NMFS immediately if any of the take indicators/levels specified in the Navy CPS Weapon System Flight Tests Biological Opinion (NMFS 2024) are exceeded.	Conditional – Immediately upon exceedance of authorized incidental take	USASMDC ENV	NMFS

Number	Notification or Reporting Requirement	Timeframe	Responsible Reporting Party	Party to Receive Report
4.0(i)	<p>Within 6 months of completion of each fiscal year, USASMDC Environmental Division would provide a report to NMFS, USFWS, and RMIEPA. The report would identify:</p> <ul style="list-style-type: none"> • Flight test(s) and date(s); • Target site(s); • Results of the pre- and post-flight surveys; • Identity and quantity of affected UES consultation resources (include photographs and videos as applicable); and • Disposition of any relocation efforts. <p>All reports should be emailed to EFHESAconsult@noaa.gov and ron.dean@noaa.gov</p>	Within 6 months of completion of each fiscal year (by February 15)	USASMDC ENV	RMIEPA, NMFS, USFWS
4.0(j)	If soil or groundwater testing results exceed the UES standards, USASMDC would notify UES Appropriate Agencies and coordinate with them to determine the scope and methods/procedures to be followed during any subsequent soil or groundwater investigations and any subsequent soil removal or other remediation activities.	Conditional – Only in the event of soil or groundwater test results exceeding UES standards	USASMDC ENV	RMIEPA, NMFS, USFWS, USEPA, & USACE
4.0 (k)	If a soil or groundwater investigation were required upon exceeding UES standards in UES § 3-6.5.8, USASMDC Environmental Division would transmit the records and reports of exceeded concentrations in soil to the RMIEPA, NMFS, and USFWS within 2 weeks from the date of receipt of such records from USASMDC RTS or the analytical laboratory.	Conditional – Only in the event of a soil investigation triggered by exceeding UES standards	USASMDC ENV	RMIEPA, NMFS, USFWS, USEPA, & USACE

Acronyms and Abbreviations:

CPS = Conventional Prompt Strike, ENV = Environmental, NMFS = National Marine Fisheries Service, RMIEPA = Republic of the Marshall Islands Environmental Protection Authority, RTS = Ronald Reagan Ballistic Missile Defense Test Site, UES = USAKA Environmental Standards, USACE = United States Army Corps of Engineers, USAG-KA = United States Army Garrison–Kwajalein Atoll, USASMDC = United States Army Space and Missile Defense Command, USEPA = United States Environmental Protection Agency, USFWS = United States Fish and Wildlife Service

5.0 Recordkeeping Procedures

UES § 2-18.3.6(a)(2) requires that a DEP include a description of any specific record keeping associated with the activity. **Table 5.0** includes the record keeping procedures which would be implemented as part of the Navy CPS Weapon System Flight Tests activity as well as the party responsible for each record keeping requirement.

Responsible parties for notification and reporting requirements include the Defense Program (Navy), USASMDC ENV, USASMDC RTS, and USAG-KA.

Table 5.0. Recordkeeping Procedures

Number	Recordkeeping Requirement	Timeframe	Responsible Party
5.0(a)	For all biological monitoring surveys and incidental observations, USASMDC Environmental Division and the USAG-KA Environmental Office would maintain records of the results and reports for at least 5 years.	≥ 5 years	USASMDC ENV & USAG-KA ENV
5.0(b)	All records associated with soil and groundwater laboratory results and studies would be maintained for at least 5 years (UES § 2-14.2.4).	≥ 5 years	USASMDC ENV & USAG-KA ENV

Acronyms and Abbreviations:

ENV = Environmental, USAG-KA = United States Army Garrison–Kwajalein Atoll, UES = USAKA Environmental Standards, USASMDC = United States Army Space and Missile Defense Command

6.0 Environmental Comments and Recommendations Received

UES § 2-18.3.6(a)(6) requires that a DEP include a copy of any environmental comments and recommendations (ECRs) on the NPA received, and USASMDC's response to the comments. **Table 6.0** serves as a copy of environmental comments and recommendations on the NPA received from UES Appropriate Agencies as well as USASMDC's responses. Because the NPA was submitted at approximately the same time as the Navy CPS Weapon System Flight Tests EA/OEA was available for public comment and because the EA/OEA was part of the NPA submission, any comments received from UES Appropriate Agencies on the Draft EA/OEA are also included in **Table 6.0**. Response to comments and recommendations include responses from both USASMDC and the Action Proponent (Navy).

7.0 Consideration of Climate Change

UES § 2-18.3.6(a)(7) requires that a DEP include a consideration of climate change and its potential impacts on the activity, and a description of related limitations and requirements. All applicable limitations and requirements are discussed in **Section 2.0** of this DEP, *Requirements and Limitations*. The Navy CPS Weapon System Flight Tests EA/OEA contains a consideration of climate change and its potential impacts on the activity. A consideration of climate change impacts can be found in sections 3.2.1.2 (page 3-23), 4.2.2.1 (page 4-13), and 4.3.2.2 (pages 4-32 to 4-34) of the Navy CPS Weapon System Flight Tests Final EA/OEA in **Appendix A**.

8.0 Consideration of Environmental Justice Concerns

UES § 2-18.3.6(a)(8) requires that a DEP include a consideration of effects of the proposed activity and mitigation measures on communities with environmental justice concerns, including Indigenous communities, and a description of related limitations and requirements. Proposed activity-related limitations and requirements are discussed in **Section 2.0** of this DEP, *Requirements and Limitations*. The Navy CPS Weapon System Flight Tests EA/OEA contains a consideration of the effects of the proposed activity on communities with environmental justice concerns. A consideration of environmental justice concerns can be found in sections 3.2.7 (pages 3-41 to 3-42), 4.2.2.7 (page 4-24), and 4.3.2.2 (page 4-36) of the Navy CPS Weapon System Flight Tests Final EA/OEA in **Appendix A**.

Table 6.0. Environmental Comments and Recommendations Received on the NPA and Draft EA/OEA

Comment Number	Environmental Comment or Recommendation	USASMDC and Navy Responses
United States Federal Agency Comments		
United States Environmental Protection Agency (USEPA), Region 9		
USEPA-01	<p>Streamlining Environmental Review Processes</p> <p>Since 2019, the EPA has expressed concerns regarding the insufficient and fragmented approach of DoD's impact assessments under NEPA for its missile testing actions that impact Illeginni Islet, lagoon, and offshore waters at the United States Army Kwajalein Atoll's (USAKA) Ronald Reagan Ballistic Missile Defense Test Site. Separate environmental assessments analyzing the individual testing actions have not fully captured the cumulative impacts that DoD agency missile tests have on the shared target site at Illeginni Islet. We have repeatedly recommended a programmatic NEPA document be prepared, in order to remedy this fragmentation.</p> <p>According to the response to comments, the USASMDC is currently planning to evaluate the range of mission flight test activities at USAKA in a programmatic context; however, we recently learned that the programmatic effort would occur not under NEPA, but rather as a Document of Environmental Protection (DEP), pursuant to the Environmental Standards and Procedures for U.S. Army Kwajalein Atoll Activities (UES) in the Republic of the Marshall Islands (RMI). The EPA believes this is a missed opportunity to streamline both the UES and NEPA processes, and we continue to recommend that a programmatic NEPA document be prepared. The Council on Environmental Quality NEPA regulations direct Federal agencies to integrate the requirements of NEPA with other planning "to the fullest extent possible" (40 CFR 1502.24(a)). Nevertheless, we appreciate that a programmatic DEP will be prepared, and continue to be available to assist in early review and input as needed. We would appreciate receiving schedule information for that effort. We note that while not intended for NEPA compliance, the comprehensive information in the programmatic DEP may still inform the cumulative impacts analyses in the multiple individual flight test EAs.</p>	<p>Thank you for expressing your concerns regarding streamlining of the environmental review process for DoD testing actions at USAKA. As one of many DoD programs utilizing USAKA for flight test activities, Navy SSP would not be the proponent agency evaluating Ronald Reagan Ballistic Missile Defense Test Site (RTS) program activities; therefore, this programmatic analysis is not addressed in the Navy CPS EA/OEA.</p> <p>USASMDC is currently evaluating the environmental impacts of the full range of RTS mission flight test activities in accordance with requirements of the UES. USASMDC notes the USEPA's comment regarding streamlining of the NEPA process as well. USASMDC will continue to coordinate with the USEPA throughout the RTS mission activities programmatic environmental analysis process.</p>
USEPA-02	<p>Environmental Justice - Fish Contamination</p> <p>DoD acknowledges that fisheries are an important economic and cultural aspect of the RMI community, and that "cumulative effects on environmental</p>	<p>The Navy appreciates the USEPA's concerns associated with fish contamination at USAKA. The Navy has determined that while Navy CPS activities result in negligible to minor contributions to contaminants at Kwajalein</p>

Comment Number	Environmental Comment or Recommendation	USASMDC and Navy Responses
	<p>justice resources at Kwajalein Atoll have likely occurred due to past military actions" (p. 41). While the Final Southern U.S. Army Garrison – Kwajalein Atoll Fish Study conducted by the U.S. Army Public Health Center in 20172 revealed that fish were contaminated with several pollutants, tungsten was not tested and the Draft EA response to comments indicates that the potential effects of residual tungsten on biotic communities is largely unknown. Given this information, the EPA recommends an additional fish study to determine whether tungsten or additional pollutants are present in fish whose consumption could be a pathway of exposure for local communities. We also recommend localized communication methods regarding best practices and safe fish consumption, as described in the next section.</p>	<p>Atoll, these contributions to baseline and cumulative fish contamination levels would be undetectable and insignificant. Therefore, the Navy has determined that no CPS program-specific fish studies would be conducted.</p> <p>USASMDC notes the USEPA's recommendation for additional fish studies to test for the presence of tungsten and other previously untested pollutants in fish tissues.</p>
USEPA-03	<p>Environmental Justice - Community Engagement and Outreach Strategy</p> <p>Executive Order 14096, Revitalizing Our Nation's Commitment to Environmental Justice for All (April 21, 2023), directs Federal agencies to provide opportunities for early and meaningful involvement in the environmental review process for communities with environmental justice concerns potentially affected by a proposed action (E.O. 14096, Section 3(a)(ix)(C)). Therefore, we highlight the importance of localized public outreach. We recommend conducting focused community engagement, which could include educational efforts with local fishing groups, ensuring public information is translated as necessary, and including information on cooking techniques to reduce exposure to contaminants.</p>	<p>The Navy has provided opportunities for involvement in the Navy CPS environmental review process through Draft EA/OEA notices of availability published in local newspapers and sent to interested stakeholders with details regarding multiple ways to submit comments. The Navy also plans to publish and send notices of availability of the Draft DEP for public comment. All newspaper notices in the RMI are published in both English and Marshallese. Copies of environmental documents are made available online and in local libraries. Based on the potential impacts of the Proposed Navy CPS Action, the Navy has determined that no additional outreach specifically regarding fish contamination at USAKA is warranted for this program.</p> <p>USASMDC notes the USEPA's recommendation for additional community engagement regarding existing fish contamination at USAKA and is willing to discuss this issue further with USEPA, in conjunction with the United States Army Garrison – Kwajalein Atoll (USAG-KA), in the future.</p>
USEPA-04	<p>Stratospheric Ozone Depletion</p> <p>We appreciate the information in the public DEA highlighting our comment regarding stratospheric ozone depletion. The additional information explains how global rocket emissions cause ozone depletion and deposit particulates in the stratosphere and that these global atmospheric impacts are likely to increase in the future as space traffic is projected to increase, resulting in cumulative effects (p. 4-35). We suggest that future flight test impact assessments discuss these impacts for all aspects of the project, not just under the impacts to broad ocean areas since they occur with all flights regardless of target location, and that the authors consider adding a heading (such as "impacts to stratospheric ozone") that distinguishes this discussion</p>	<p>The Navy has added additional discussion of the potential stratospheric ozone depletion effects of the Proposed Action in a cumulative context, especially as it relates to proposed activities at Kwajalein Atoll, to the Final EA/OEA and Draft DEP. The Navy has considered the latest scientific assessments recommended by the USEPA in preparation of the Final EA/OEA with consideration of the guidance provided by 40 CFR 1502.21 for incomplete or unavailable information.</p>

Comment Number	Environmental Comment or Recommendation	USASMDC and Navy Responses
	<p>from the discussion of ground-level air quality impacts. While a small number of flight tests are evaluated in each impact assessment, a practice which lends credence to individual less-than-significant impact conclusions, it is important to try to capture the collective impacts from all the flight tests being planned, some of which are identified in Table 4.3.1-1 - Past, Present, and Reasonably Foreseeable Actions.</p> <p>The latest scientific assessment of ozone depletion considers future scenarios of space industry emissions, including the potential for a significant increase in launch rates. Some studies suggest that with a weekly launch frequency, which will be exceeded at Vandenberg Space Force Base alone, rockets could be responsible for stratospheric ozone loss to an extent that researchers have identified as being of concern. We note that the solid fuel propellant used for these missile launches has a much larger impact on stratospheric ozone than rockets used in commercial space launches. We recommend the Final EA discuss stratospheric ozone depletion effects of the proposed action in the cumulative context, utilizing the guidance provided in 40 CFR 1502.21 for incomplete or unavailable information.</p>	
National Marine Fisheries Service (NMFS) Pacific Islands Regional Office		
NMFS-01	<p>Comments</p> <p>This submission includes the Navy CPS Weapon System Flight Tests Draft Environmental Assessment (EA) / Overseas Environmental Assessment (OEA) and the Navy CPS Weapon System Flight Tests Biological Assessment for Activities at Kwajalein Atoll. These EAs include requirements set by the UES.</p> <p>This assessment describes approximately 80 missile test flights. Each test will drop waste in open ocean environments and terminate in the ocean or at Illeginni Islet. Direct environmental impacts of any individual described flight test are expected to be minor, however, minor additive impacts by many cumulative actions over multiple decades have the potential to result in significant environmental degradation and impacts to people through cumulative environmental impacts. These include potential impacts to habitats and humans via contaminated seafoods. Our recent environmental reviews of similar weapons testing activities have expressed these concerns.</p> <p>The ongoing global loss of coral reef ecosystems, including the multitude of protected species that make them up, is a result of cumulative impacts from a</p>	<p>Thank you for your environmental comments and recommendations. The Navy and USASMDC appreciate the concerns NMFS presented in the submitted comments. USASMDC and the Navy have noted these concerns and responded to specific recommendations made by NMFS in comment items that follow.</p>

Comment Number	Environmental Comment or Recommendation	USASMDC and Navy Responses
	<p>variety of direct and indirect human influences. Therefore, the additional physical and chemical disturbances arising from weapons testing at any scale creates direct and indirect impacts that should be mitigated or avoided to the best extent possible.</p> <p>Terminal payload impacts at Illeginni will disperse debris, dust, and volatilized contaminants. Debris and ejecta could directly impact biological resources in an area up to a 300-foot radius from the point of impact. Fugitive dust caused by impact would be redistributed to waters adjacent to (most likely westward/downwind of) the site. Contaminants could settle in nearshore ecosystems. Any soil and water contamination on Illeginni could be deposited in the nearshore environment via groundwater seeps, saltwater/groundwater mixing, and erosion, and increasingly so with rising sea levels and climate change.</p> <p>It is unclear how added and redistributed contaminants could impact nearshore environments into the future. It is therefore important to ensure robust sampling and testing procedures are carried out across impact sites and adjacent zones. Sampling wells at Illeginni should be maintained and sampled using scientifically robust procedures.</p> <p>Enhanced environmental monitoring of lagoon and seaward coral reefs, including long term site-specific data collection to monitor changes to coastal benthic habitats around Illeginni versus other similar sites, would be advantageous to support understanding of global versus local impacts to reefs there.</p> <p>Terminal payload impacts have the potential to affect species and habitats at Illeginni protected under the UES.</p> <p>Additive toxic effects on subsistence fisheries, even at small scale are, at this point, a cause for concern, given previously documented PCB and heavy metal contamination in such fisheries. Any added toxicity to locally consumed resources could be considered environmental injustice.</p> <p>Cumulation of minor additive environmental impacts can amplify the significance of each minor impact over time. It is important to avoid legal and harmful thresholds and ensure that sufficient monitoring is carried out to accurately track those impacts collectively.</p>	

Comment Number	Environmental Comment or Recommendation	USASMDC and Navy Responses
NMFS-02	Recommendation 1 The Service recommends additional description of soil and water sampling procedures at Illeginni considering likely heterogeneous mixture of contaminants in soil there. Potential redistribution of legacy contaminants and maintaining sampling wells are points that warrant further description.	The Final EA/OEA includes more specific reference to the USASMDC Illeginni Islet soil and groundwater sampling plans which are in preparation by USASMDC. These sampling plans, including the associated sampling procedures, will be coordinated with NMFS and other UES Appropriate Agencies prior to finalization. Since the detailed sampling procedures are still being finalized, additional details were not added to the Final EA/OEA or DEP except by reference to the sampling plans which would contain those procedures.
NMFS-03	Recommendation 2 The Service recommends developing a plan to continue long-term ecological monitoring (e.g. photogrammetry plots) at fixed sites to better understand nearshore (e.g. coral reef) ecosystems at Illeginni, including comparison to similar nearby environments. The Service can advise and/or continue to carry out photogrammetry monitoring as initiated in 2023 in order to document change over time.	Based on additional communications, USASMDC understands that NMFS has established initial photogrammetry plots at several USAKA islets. USASMDC would like to continue discussion with NMFS regarding the potential for long-term photogrammetry plots for monitoring reefs and for NMFS to continue carrying out this type of monitoring. The Navy has not included a measure for development of a plan to continue long-term ecological monitoring at fixed sites in the Navy CPS Final EA/OEA or DEP as development of any long-term monitoring measures such as this would be best discussed with USASMDC or USAG-KA as part of comprehensive USAKA-wide program activities.
NMFS-04	Recommendation 3 The Service recommends sampling Illeginni wildlife (e.g. shellfish tissues, fish fats and organs, bird blood, feathers, and/or egg shells) for heavy metals and other relevant contaminants to identify any potential transfer of contaminants to biological organisms.	USASMDC notes the NMFS's recommendation for additional sampling and testing of wildlife tissues for contaminants at USAKA and is willing to discuss this issue further with NMFS, in conjunction with USAG-KA, in the future. The Navy has not included a measure for wildlife tissue sampling in the Navy CPS Final EA/OEA or DEP as the Navy's review and evaluation of available data indicate that the program's contribution to potential contaminants would be undetectable to minor. Any long-term USAKA-wide sampling or monitoring of legacy contaminants (if implemented) would be the responsibility of USASMDC or USAG-KA as part of USAKA-wide program activities.
NMFS-05	Recommendation 4 The Service recommends additional reporting on past and ongoing sources of contaminants present in fish species locally harvested from Kwajalein lagoon, potential effects on consumers, and relationships between this and potential impacts (even minor, considering additive/cumulative effects) of the proposed activities in combination with other sources of contaminants. While the documents provided indicate that current available data do not allow for quantitative characterization of cumulative effect on biological or human	USASMDC is not aware of additional reports on past or ongoing sources of contaminants in fish species that were not presented in the Navy CPS Draft EA/OEA and NPA (See section 3.2.7 of the EA/OEA). Existing studies have shown that the primary human health risk contaminants in fish at USAKA are lead, pesticide chemicals, and some PCBs (APHC 2017). Studies have indicated that the predominant sources of historical pollution are thought to be sandblast material derived from maintenance operations and pesticides applied to building foundations (APHC 2017). These studies have also

Comment Number	Environmental Comment or Recommendation	USASMDC and Navy Responses
	resources at Kwajalein, tracking the available information is relevant to a thorough qualitative approach.	revealed that, despite several decades of payload testing at Illeginni Islet, potential contaminants associated with payload testing (i.e., metals) were not higher in fish tissues at Illeginni than at other sample sites in Kwajalein Atoll (APHC 2017). The primary contaminants found in fish tissues which contribute to human health risk at Illeginni are the pesticide chemical Chlordane and the PCBs Aroclors (APHC 2017) which are not used in flight testing. USASMDC and the Navy have included the currently available information relative to potential cumulative effects at Navy CPS activity locations which is summarized in the Navy CPS EA/OEA and NPA and detailed in cited reference documents such as the Final Southern USAG-KA Fish Study Report (APHC 2017).
NMFS-06	Recommendation 5 The Service recommends additional consideration of any available options for offsetting potential contributions of proposed actions to contaminants found in fished species.	Based on review and evaluation of available data on fish contamination as well as the potential contaminants associated with Navy CPS flight testing, the primary concern for additive fish contamination due to flight testing would be potential increase in metals such as lead. Flight test activities would include clean-up of all visible impact debris. It is the intention to clean up all metal test debris after an Illeginni Islet impact, including onboard batteries. It is expected that very little test debris would remain. Because of test cleanup activities, the contribution of proposed activities to contaminants found in fish species (see APHC 2017) is expected to be none to undetectable. As stated in the response for comment number NMFS-05, the available evidence suggests that fish contamination at USAKA is primarily the result of historic maintenance activities and that metal contaminant levels in fish at Illeginni Islet are not statistically higher than at other USAG-KA utilized islets or at other islets. Navy CPS flight test activities are expected to have no to undetectable contributions to fish contaminants; therefore, the Navy and USASMDC find that no offsetting options would need to be implemented for this program.

Acronyms and Abbreviations:

CFR = Code of Federal Regulations, CPS = Conventional Prompt Strike, DEA = Draft EA, DEP = Document of Environmental Protection, DoD = Department of Defense, EA = Environmental Assessment, NEPA = National Environmental Policy Act, NMFS = National Marine Fisheries Service, NPA = Notice of Proposed Activity, OEA = Overseas EA, PCB = polychlorinated biphenyl, RMI = Republic of the Marshall Islands, RTS = Ronald Reagan Ballistic Missile Defense Test Site, UES = USAKA Environmental Standards, USAG-KA = United States Army Garrison – Kwajalein Atoll; USAKA = United States Army Kwajalein Atoll, USASMDC = United States Army Space and Missile Defense Command, USEPA = United States Environmental Protection Agency

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APPENDIX A

Navy Conventional Prompt Strike Weapon System Flight Tests Final Environmental Assessment / Overseas Environmental Assessment

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Navy Conventional Prompt Strike Weapon System Flight Tests

Environmental Assessment/ Overseas Environmental Assessment

Final
Volume 1: Chapters 1-7

Department of the Navy

January
2025



Cover images: Illeginni Islet, Kristin Miller; Bigeyes in Kwajalein Lagoon, Kristin Miller; Hawksbill turtle in Kwajalein Lagoon, Kristin Miller; Steephead parrotfish in Kwajalein Lagoon, Kristin Miller.

Navy Conventional Prompt Strike Weapon System Flight Tests Final Environmental Assessment/ Overseas Environmental Assessment

Lead Agency: Department of the Navy
Action Proponent: Strategic Systems Programs
Title of Proposed Action: Navy Conventional Prompt Strike Weapon System Flight Tests
Project Location: Atlantic and Pacific Ocean regions
Point of Contact: Environmental Program Manager/SP2521
Strategic Systems Programs
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Document Date: January 2025

Abstract

The Department of the Navy has prepared this Environmental Assessment (EA) / Overseas Environmental Assessment (OEA) to evaluate the potential environmental impacts of the Proposed Action to meet requirements of the U.S. National Environmental Policy Act (NEPA). The Proposed Action consists of conducting Navy Conventional Prompt Strike (CPS) weapon system (missile) flight tests in both Atlantic and Pacific Ocean regions. Testing would involve up to eight flight test launches per year from various sea-based launch locations conducted over a 10-year period. All flight tests would be at-sea missile tests launched from existing naval vessels operating in Pacific and Atlantic broad ocean areas. After launch, flight test activities would include vehicle flight over the Pacific and/or Atlantic Oceans and would involve splashdown of spent boosters and fairings in Pacific and Atlantic broad ocean areas. Navy CPS flight test payloads would impact at target sites in the broad ocean area and at U.S. Army test sites at Kwajalein Atoll within the Republic of the Marshall Islands.

The EA/OEA evaluates the potential impacts to the human and natural environment from implementing the proposed CPS weapon system flight tests program. The No Action Alternative is also evaluated as a requirement of NEPA to serve as a baseline from which to analyze the effects of not implementing the test program. Supported by the information and environmental analysis presented in this document, the Navy will decide whether to conduct up to eight CPS flight tests annually over a 10-year period or to select the No Action Alternative. The EA/OEA evaluates several environmental/resource categories within the affected environment that potentially could be impacted to provide Navy decision makers with sufficient information to plan and make informed decisions on the proposed CPS flight test program. Under the No Action Alternative, proposed CPS flight tests and associated activities would not occur. Other Department of Defense training and testing actions in both the Pacific and Atlantic study areas would continue to occur and baseline environmental conditions would not change under the No Action Alternative. Implementation of the Proposed Action would not significantly impact the quality of the human and natural environment and would not significantly harm the environment of the global commons (high seas).

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Executive Summary

ES.1 Introduction

The Department of the Navy (DON or Navy) has prepared this Environmental Assessment (EA) / Overseas Environmental Assessment (OEA) to analyze potential environmental impacts from conducting proposed Conventional Prompt Strike (CPS) weapon system (missile) flight tests in both Atlantic and Pacific Ocean regions. Supported by the U.S. Army Space and Missile Defense Command (USASMDC), the Navy prepared this EA/OEA in accordance with the National Environmental Policy Act (NEPA), Navy and Department of Defense policies and regulations for implementing NEPA, Executive Order 12114 (Environmental Effects Abroad of Major Federal Actions), and the Environmental Standards and Procedures for U.S. Army Kwajalein Atoll (USAKA) Activities in the Republic of the Marshall Islands, 17th Edition (USASMDC 2024) or UES.

ES.2 Purpose and Need

The purpose of the Proposed Action is to perform tests in a sea-based environment to prove the Navy CPS weapon system meets all key performance requirements for operational use. Testing the CPS weapon system at sea is needed to establish and verify CPS capabilities required to enhance U.S. options to respond to time-sensitive threats, thereby maintaining technical superiority against adversaries. The proposed series of CPS at-sea missile flight tests will allow the Navy to collect data needed to further demonstrate that weapon system development efforts have been successful, enabling its operational deployment for use in sea-based environments.

ES.3 Description of the Proposed Action and Alternatives

The Proposed Action is to perform Navy CPS weapon system flight tests in a sea-based environment. The Proposed Action would consist of up to eight flight test launches at up to eight different sea-based launch locations per year, conducted over a 10-year period beginning in fiscal year 2025. The CPS all-up-round missile is composed of a two-stage vehicle missile body and a Common Hypersonic Glide Body payload. Each flight test would involve pre-test preparations and operations, at-sea vehicle launch, vehicle flight over a broad ocean area (BOA), booster splashdown in the BOA, payload impact at either an ocean or land target site, and post-test operations.

Several alternatives were considered for implementation of the Proposed Action; however, the Navy has identified only one alternative (the Preferred Alternative) that meets the purpose, need, and program objectives. Under the Preferred Alternative, proposed flight tests would be conducted within broad Atlantic and Pacific Ocean areas. The Preferred Alternative would integrate a series of existing ranges, operational areas (OPAREAs), and BOAs to test the effectiveness of the CPS weapon system. All CPS vehicle launches would occur at sea from existing naval vessels while using ocean-based or land-based locations for targets. Under the Preferred Alternative, locations for CPS payload target sites would include ocean-based sites in Atlantic and Pacific BOAs and at the Kwajalein Missile Impact Scoring System in Kwajalein Atoll

in the Republic of the Marshall Islands (RMI), and one land-based target site at Illeginni Islet in the RMI. Floating target rafts would be utilized for a subset of flight test events involving payload impact in the Pacific and Atlantic BOAs. The flight tests would be supported by several existing U.S. military installations, ranges, and range complexes located in the Atlantic and Pacific Ocean regions.

This EA/OEA also evaluates the environmental consequences of the No Action Alternative. Under the No Action Alternative, the Navy would not conduct sea-based CPS weapon system flight testing. While CPS weapon system testing would not occur, Department of Defense (DoD) testing and training activities within existing naval OPAREAs, sea ranges, range complexes, and other DoD training and testing areas in the CPS study area would continue. By not implementing the Proposed Action, the Navy would not be able to achieve the goal of proving that the new hypersonic weapon system meets all key performance requirements for deployment to sea-based platforms or operational use in a sea-based environment.

ES.4 Summary of Environmental Consequences

This EA/OEA evaluates the potential impacts to the human and natural environment from implementing the CPS weapon system flight tests program under the Preferred Alternative. The No Action Alternative was also evaluated as a requirement of NEPA to serve as a baseline from which to analyze the effects of not implementing the test program.

Under the No Action Alternative, proposed CPS flight tests and associated activities would not occur. Other DoD training and testing actions in both the Pacific and Atlantic study areas would continue to occur. DoD training and testing has been occurring for decades in the BOAs and at Kwajalein Atoll and would continue. As a result, baseline environmental conditions for all resource topics are not expected to change under the No Action Alternative.

Table ES-1 provides a tabular summary of the potential impacts to environmental resource topics associated with the Proposed Action under the Preferred Alternative as well as cumulative impacts in combination with other past, present, and reasonably foreseeable future actions. Overall, implementation of the Proposed Action would not significantly impact the quality of the human and natural environment and would not significantly harm the environment of the global commons (high seas).

Table ES-1. Summary of Environmental Consequence and Cumulative Effects under the Preferred Alternative

Resource Topic	Preferred Alternative	Cumulative Effects
Air Quality (including Greenhouse Gases and Climate Change)	<ul style="list-style-type: none"> No significant impacts to air quality would occur in the Atlantic and Pacific BOAs, KMISS, and Illeginni Islet with implementation of the Proposed Action. Terminal payload impact at Illeginni Islet would result in fugitive dust and may volatilize minor quantities of some contaminants already present; however, any emissions associated with impact would be within the UES air quality standards. CPS flight tests would incrementally contribute to global emissions of greenhouse gases and are anticipated to have a minor impact. It is anticipated that the potential greenhouse gas emissions from CPS flight tests would not result in noticeable effects to climate change – less than a 0.0001% change from the Proposed Action. 	<ul style="list-style-type: none"> The Proposed Action annual greenhouse gas emissions would have a minor incremental additive contribution to cumulative greenhouse gases and climate change when combined with other flight test programs and actions. It is possible that cumulative effects related to climate change would affect the potential environmental consequences of the Proposed Action on environmental resource topics considered. The exact potential impacts from the emissions from the Proposed Action along with other present and future foreseeable future actions are unquantifiable at this time. No cumulative effects of greenhouse gases or climate change have been identified which would affect the implementation of the Proposed Action over the 10-year period of testing.
Cultural Resources	<ul style="list-style-type: none"> There are no identified cultural resources with the potential to be affected along the possible flight paths over the ocean or in the Atlantic and Pacific BOAs. Therefore, there would be no adverse effects to cultural resources within the Atlantic and Pacific BOAs from the CPS flight tests. No significant impacts are anticipated to occur to archaeological or historic resources at Illeginni Islet. The existing range target site on the west end of Illeginni Islet would be used as a target site for CPS flight tests. Previous archaeological investigations of Illeginni Islet have not found indigenous cultural or World War II materials. Cold War era buildings, eligible for listing in the Republic of the Marshall Islands National Register of Historic Places, on the opposite end of the islet would not be impacted by proposed activities. 	<ul style="list-style-type: none"> No interactive or additive effects have been identified which would contribute to cumulative effects on cultural resources. Therefore, the Proposed Action in conjunction with other actions would not result in cumulative effects on cultural resources.
Biological Resources	<ul style="list-style-type: none"> The Proposed Action has the potential to impact biological resources through exposure to elevated sound levels, direct contact from test components, exposure to hazardous materials, and increased human activity and equipment operation. Overall, there would be no significant impacts to biological resources, including special status resources, with implementation of the Proposed Action. Available data indicate that all potential impacts on biological resources in the BOAs and at Kwajalein Atoll would be negligible to moderate. Activities within the BOAs may affect but are not likely to adversely affect species or habitats protected under the Endangered Species Act, as all potential effects would be discountable or insignificant. 	<ul style="list-style-type: none"> Cumulative effects on biological resources in the BOAs and at Kwajalein Atoll have likely occurred due to past military actions, commercial and subsistence fisheries, and the impacts of climate change. Current available data do not allow for quantitative characterization of cumulative effects, especially on nearshore and terrestrial biological resources at Illeginni Islet; therefore, cumulative effects were primarily evaluated using a qualitative approach.

Navy CPS Weapon System Flight Tests EA/OEA
Executive Summary

Resource Topic	Preferred Alternative	Cumulative Effects
Biological Resources (continued)	<ul style="list-style-type: none"> At Illeginni Islet, terminal payload impact has the potential to affect species and habitats protected under the UES; therefore, the Navy has coordinated and consulted with UES Appropriate Agencies under requirements of the UES. The Proposed Action would not result in any take, including level B harassment, of any marine mammal species, nor would it result in any incidental take of migratory birds that might result in a significant adverse effect on the sustainability of a population. There would be no adverse effects on essential fish habitat, national marine sanctuaries, or marine national monuments. 	<ul style="list-style-type: none"> No effects of the Proposed Action have been identified that would have interactive or meaningful additive effects on cumulative effects on biological resources. Based on the relatively small scale of proposed activities and on available data regarding the state of cumulative effects on biological resources, the Proposed Action would have negligible to minor contributions to cumulative effects on biological resources.
Geology and Soils	<ul style="list-style-type: none"> There would be no adverse effects from the Proposed Action to geological and soil resources in the Atlantic or Pacific BOAs. Payload impact at Illeginni Islet would result in formation of a crater. Based on the composition of the structure of the CPS flight body, the expected concentration of toxic heavy metals would be minimal at the impact location. Historical post-test soil sampling results for Illeginni Islet indicate beryllium, tungsten, and uranium at the target site have been below the UES compliance requirements. Minor, short-term adverse impacts would be expected as a result of payload impact at Illeginni Islet. 	<ul style="list-style-type: none"> Continued military testing at the land impact site on Illeginni Islet has the potential to result in cumulative effects on soils on the islet and in adjacent marine sediments through accumulations of heavy metals and other materials in the soil there. Post-test and/or periodic soil sampling for uranium, beryllium, and tungsten would be conducted at Illeginni Islet as part of a comprehensive monitoring program for RTS flight testing activities to ensure soils do not exceed UES compliance standards. Negligible cumulative effects on geology and soils are expected.
Water Resources	<ul style="list-style-type: none"> Groundwater or surface water resources within the BOAs or KMISS would not be significantly impacted by the proposed flight tests. Disturbance to ocean waters would be limited to the individual test components and payloads sinking thousands of feet to the ocean floor. Some payload debris, including heavy metals and other materials, may be released into the ocean area. However, adverse water quality impacts are expected to be negligible in the BOAs and KMISS. Illeginni Islet has no surface water; groundwater is very limited in quantity and is brackish and non-potable. Previous pre-and post-flight test groundwater sampling at Illeginni Islet has shown little variation in the concentrations of heavy metals with beryllium remaining undetected, tungsten exceeding residential tap water screening levels, and uranium well below the U.S. Environmental Protection Agency maximum contaminant level for drinking water. With the reasonably foreseeable land use at Illeginni Islet remaining as an active range and with the groundwater being not potable, the impacts on water resources from the Proposed Action would reasonably be expected to be adverse short-term minor impacts. 	<ul style="list-style-type: none"> Continued monitoring of groundwater at Illeginni Islet is planned as part of a comprehensive monitoring program for ongoing RTS flight testing activities. No interactive effects with those of past, present, or future actions have been identified and the proposed up to one land impact per year would be expected to have negligible to minor additive contributions to cumulative effects on water resources at Illeginni Islet.

Resource Topic	Preferred Alternative	Cumulative Effects
Hazardous Materials and Waste Management	<ul style="list-style-type: none"> Within the Atlantic and Pacific BOAs, implementation of the Proposed Action would result in introduction of potentially hazardous materials and waste as spent boosters and payloads enter the ocean. Hazardous materials are not expected to be found in concentrations high enough to adversely affect human environmental quality or habitat quality for marine life in the BOAs. Hazardous materials and wastes are expected to have negligible to minor impacts on environmental quality in the Atlantic and Pacific BOAs. At USAKA, no significant impacts on hazardous materials and waste management are expected at either KMISS or Illeginni Islet. At KMISS, CPS payload materials are expected to sink to the ocean floor with little potential for impact on marine life. At Illeginni Islet, approximately one CPS payload impact per year may occur throughout the CPS flight test program's 10-year period. The CPS payload impact would be expected to form a crater and ejected material and payload debris could be scattered around the point of impact. Any visible test debris found would be collected as much as practicable, including hazardous materials. 	<ul style="list-style-type: none"> After decades of DoD testing at Illeginni Islet, no significant accumulation of hazardous materials has been detected. Continued soil and groundwater testing at Illeginni Islet and established response procedures for exceedance of levels specified in the UES substantially reduce the risk of cumulative hazardous materials effects. Given the protective measures in place to prevent cumulative effects for hazardous materials and wastes at Kwajalein Atoll, no cumulative effects are anticipated.
Environmental Justice	<ul style="list-style-type: none"> Under the Proposed Action, no significant impacts on environmental justice are expected in the BOAs or at Kwajalein Atoll. The Navy has identified no human health, environmental, or other effects of the Proposed Action that would result in disproportionately high or adverse effects on minority or low income-populations. Proposed activities would have negligible impacts on the environmental justice concern of subsistence fishing or related human health. 	<ul style="list-style-type: none"> The potential exists for negligible additive contributions to cumulative effects on subsistence fisheries, the Proposed Action would have negligible impacts (i.e., undetectable levels of effect) on cumulative effects to topics of environmental justice concern.
Human Health and Safety	<ul style="list-style-type: none"> The Proposed Action in both the Atlantic and Pacific BOAs would be conducted using existing naval vessels and would operate in accordance with established Navy safety procedures to protect personnel and the public. All BOA target sites would be located outside of exclusive economic zones in international waters. Proposed activities would not have significant impacts to health and safety. All DoD testing activities at KMISS and Illeginni Islet take place within an active U.S. Army testing range and are therefore conducted in accordance with applicable U.S. Army and other federal and state safety standards and requirements. CPS flight tests at USAKA would not introduce new types of activities or increase levels of risk to personnel or the public. The Proposed Action would not result in significant impacts to health and safety. 	<ul style="list-style-type: none"> No substantial additive or interactive cumulative effects on health and safety have been identified.

Acronyms and Abbreviations: BOA = Broad Ocean Area, CPS = Conventional Prompt Strike, DoD = Department of Defense, KMISS = Kwajalein Missile Impact Scoring System, U.S. = United States, UES = Environmental Standards and Procedures for U.S. Army Kwajalein Atoll (USAKA) Activities in the Republic of the Marshall Islands

ES.5 Mitigation Measures

The Navy would implement mitigation measures and standard operating procedures as specified in **Appendix C** of the EA/OEA in order to avoid or reduce potential impacts on the identified environmental resources areas.

ES.6 Other Considerations

In accordance with 40 Code of Federal Regulations § 1502.16(c), analysis of environmental consequences shall include discussion of possible conflicts between the Proposed Action and the objectives of federal, regional, state, and local land use plans, policies, and controls. The principal federal and state laws and regulations that are applicable to the Proposed Action as well as the Navy's compliance for the Proposed Action are detailed in **Table 5.1-1** of the EA/OEA.

The Navy notified, coordinated, and consulted with relevant agencies on the Proposed Action to identify and resolve potential environmental issues and regulatory requirements associated with implementation of the Proposed Action. The Navy has conducted coordination and consultation with the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS) under requirements of Section 7 of the Endangered Species Act, and with UES Appropriate Agencies (i.e., RMI Environmental Protection Authority, U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, NMFS, and USFWS) under requirements of the UES.

ES.7 Public Involvement

As part of the NEPA process the Navy made the Draft EA/OEA for the CPS Weapon System Flight Tests available for a 30-day public comment period via the Internet at <https://www.nepa.navy.mil/CPSSea-Based>. Additionally, the Notice of Availability for the EA/OEA was published in newspapers in the United States and the RMI. Comments on the Draft EA/OEA, and responses to those comments, are provided in **Appendix A, Section A.2.2** of the Final EA/OEA.

Following the 30-day public review period, the Navy determined that preparation of an Environmental Impact Statement / Overseas Environmental Impact Statement was not required and decided to finalize the EA/OEA. The Navy prepared the Final EA/OEA with consideration of all public and agency comments received during public review of the Draft EA/OEA. The Final EA/OEA and Finding of No Significant Impact / Finding of No Significant Harm will be accessible via the internet at <https://www.nepa.navy.mil/CPSSea-Based>. A Notice of Availability for the Final EA/OEA and Finding of No Significant Impact / Finding of No Significant Harm will be published in newspapers in the United States and the RMI.

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Acronyms and Abbreviations

Acronym / Abbreviation	Definition
AUR	All-Up-Round
BOA	Broad Ocean Area
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
C-HGB	Common Hypersonic Glide Body
CO ₂	Carbon Dioxide
CO _{2e}	Carbon Dioxide Equivalent
CPS	Conventional Prompt Strike
dB	Decibel(s)
DoD	Department of Defense
DPS	Distinct Population Segment
EA	Environmental Assessment
EEZ	Exclusive Economic Zone
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
EO	Executive Order
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FONSH	Finding of No Significant Harm
FONSI	Finding of No Significant Impact
FR	Federal Register
ft	Foot/Feet
GBSD	Ground Based Strategic Deterrent (now Sentinel)
GHG	Greenhouse Gas
KMISS	Kwajalein Missile Impact Scoring System
mg/kg	Milligrams per Kilogram
MSA	Magnuson-Stevens Fishery Conservation and Management Reauthorization Act
NAAQS	National Ambient Air Quality Standards
NASA	National Aeronautics and Space Administration
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act

Acronym / Abbreviation	Definition
nm	Nautical Mile
NMFS	National Marine Fisheries Service
NOTAM	Notice to Air Mission
NRHP	National Register of Historic Places
NTM	Notice to Mariners
OEA	Overseas Environmental Assessment
OEIS	Overseas Environmental Impact Statement
OPAREA	Operating Area
OPNAV	Chief of Naval Operations
OPNAVINST	Chief of Naval Operations Instruction
PCB	Polychlorinated Biphenyl
pH	Potential of Hydrogen
PM _{2.5}	Particulate Matter Less Than or Equal to 2.5 Microns in Diameter
PM ₁₀	Particulate Matter Less Than or Equal to 10 Microns in Diameter
re	Referenced to
RMI	Republic of the Marshall Islands
ROI	Region of Influence
RTS	Ronald Reagan Ballistic Missile Defense Test Site
SINKEX	Sinking Exercise
UES	USAKA Environmental Standards
U.S.	United States
USAG-KA	United States Army Garrison – Kwajalein Atoll
USAKA	United States Army Kwajalein Atoll
USASMDC	United States Army Space and Missile Defense Command
U.S.C.	United States Code
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
μPa	Micropascal

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1.0 Purpose of and Need for the Proposed Action

1.1 Introduction

The Department of the Navy (DON or Navy) has prepared this Environmental Assessment (EA) / Overseas Environmental Assessment (OEA) to analyze potential environmental impacts from conducting proposed Conventional Prompt Strike (CPS) weapon system (missile) flight tests in both Atlantic and Pacific Ocean regions. Testing would consist of up to eight flight test launches per year at various sea-based launch locations conducted over a 10-year period. All flight tests would be at-sea missile tests launched from existing naval vessels using ocean-based or land-based locations for targets. There are several existing United States (U.S.) military ranges and broad ocean areas (BOAs) in the western Atlantic Ocean, and in the eastern, central, and western Pacific Ocean, being considered for the tests.

Following review of the proposed CPS weapon system flight tests program, the Navy determined that an EA/OEA is required to assess the potential environmental effects from these types of weapon system tests. Supported by the U.S. Army Space and Missile Defense Command (USASMDC), the Navy prepared this EA/OEA in accordance with the following regulations, statutes, standards, policies, and procedures:

- National Environmental Policy Act (NEPA) of 1969, as amended (42 United States Code [U.S.C.] § 4321 et seq.)
- Executive Order (EO) 12114 (Environmental Effects Abroad of Major Federal Actions)
- President's Council on Environmental Quality regulations for implementing NEPA (40 Code of Federal Regulations [CFR] Parts 1500-1508)
- Department of Defense (DoD) regulations for implementing EO 12114 (32 CFR § 187, *Environmental Effects Abroad of Major Department of Defense Actions*)
- Navy environmental policy (Chief of Naval Operations [OPNAV] Instruction [OPNAVINST] 5090.1E [*Environmental Readiness Program*] and the accompanying OPNAV Manual 5090.1 [OPNAV M-5090.1])
- Navy policies for implementing NEPA (32 CFR § 775 et seq.)
- *Environmental Standards and Procedures for U.S. Army Kwajalein Atoll (USAKA) Activities in the Republic of the Marshall Islands*, 17th Edition (USASMDC 2024); hereafter referred to as the USAKA Environmental Standards or UES

1.2 Purpose of and Need for the Proposed Action

The purpose of the Proposed Action is to perform tests in a sea-based environment to prove the Navy CPS weapon system meets all key performance requirements for operational use. Testing the CPS weapon system at sea is needed to establish and verify CPS capabilities required to

enhance U.S. options to respond to time-sensitive threats, thereby maintaining technical superiority against adversaries. The successful development and eventual fielding of the CPS weapon system has been identified as a national security priority by the DoD with the full support of the President's Administration and the U.S. Congress (White 2023, National Science and Technology Council 2022).

The proposed series of CPS at-sea missile flight tests will allow the Navy to collect data needed to further demonstrate that weapon system development efforts have been successful. This includes the safe, timely, and effective integration of the weapon system into surface ship and submarine based platforms, enabling its operational deployment for use in sea-based environments. To meet the CPS program objectives, test events must satisfy certain critical objectives, to include demonstrating weapon system effects on targets, and demonstrating applicable design features and operating procedures to ensure the safety of the warfighter and the public.

1.3 Scope of the Environmental Analysis

This EA/OEA evaluates the potential impacts to the human and natural environment from implementing the proposed CPS weapon system flight tests program. The No Action Alternative is also evaluated as a requirement of NEPA to serve as a baseline from which to analyze the effects of not implementing the test program. Supported by the information and environmental analysis presented in this document, the Navy will decide whether to conduct up to eight CPS flight tests annually over a 10-year period or to select the No Action Alternative. If the Navy decides to conduct the CPS flight tests, it will also decide on which of the U.S. military ranges and BOAs to use for individual tests. Expectations are that multiple sea-based training and testing ranges in both the Atlantic and Pacific Ocean regions would be used in support of the flight tests. The proposed ocean study areas for conducting the CPS flight tests are shown in **Figures 1.3-1** and **1.3-2**. The location of each individual test or test campaign would be determined based on the test objectives, and the availability and technical suitability of range areas and assets. Further descriptions of the Navy's Proposed Action and ocean study areas are provided in **Chapter 2.0**.

The anticipated CPS activities that are described and analyzed in this EA/OEA include pre-flight test preparations (e.g., use of an array of missile tracking sensors and telemetry systems); naval vessel operations and missile launches at sea; spent booster stages and missile payload impacts within the BOA¹; use of floating targets in the BOA; limited missile payload impacts on land at a predetermined island target site; and post-flight test recovery and clean-up activities in the BOA and on land.

¹ For purposes of this EA/OEA, BOA is defined as any ocean area along the missile's flight path that is outside of territorial seas. Under maritime law, territorial seas generally extend seaward up to 12 nautical miles (nm) from a nation's official baseline (NOAA 2023a).



Figure 1.3-1. CPS Flight Test Study Area in the Atlantic Ocean Region

Navy CPS Weapon System Flight Tests EA/OEA
1.0 Purpose of and Need for the Proposed Action

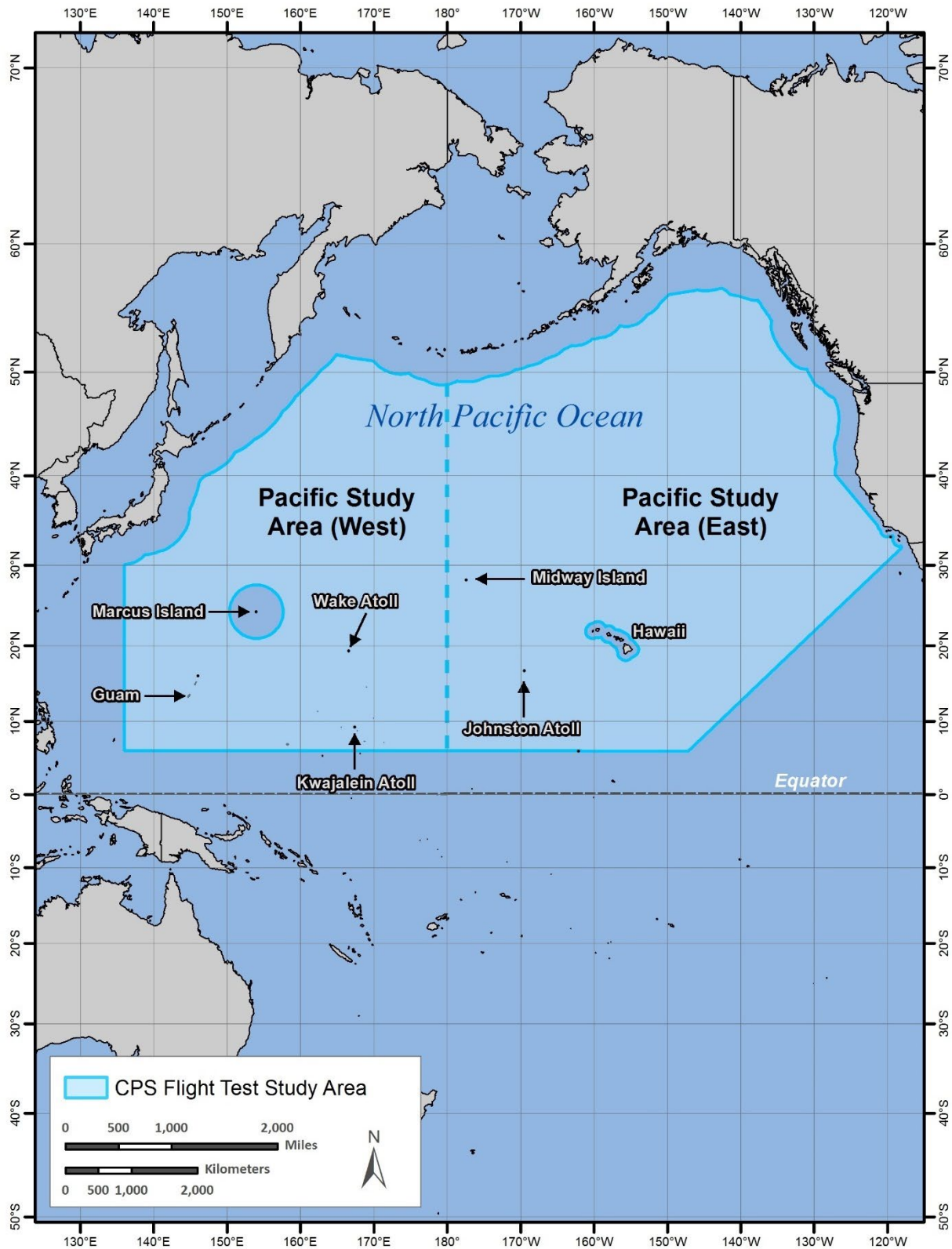


Figure 1.3-2. CPS Flight Test Study Area in the Pacific Ocean Region

In preparation for the proposed flight tests, several U.S. military installations and shipyards in both the Atlantic and Pacific Ocean regions would be used in providing various forms of logistical and operational support (e.g., fueling, supply, and maintenance of vessels; ordnance storage and handling; range asset management and operations). These types of activities conducted at existing naval installations within and outside of the continental United States are not analyzed in this EA/OEA, as these activities represent ongoing types of operations that are not dependent on CPS flight tests and therefore are considered to be outside the scope of this EA/OEA analysis. These installations and shipyards (**Table 1.3-1**) are required to maintain their own NEPA documentation and regulatory permitting for ongoing and future activities.

Table 1.3-1. Logistical and Operational Support Locations Not Analyzed in this EA/OEA

Atlantic Ocean Region Installations	Pacific Ocean Region Installations
Naval Facility Port Canaveral, Florida Naval Station Norfolk, Virginia Naval Submarine Base Kings Bay, Georgia Naval Submarine Base New London, Groton, Connecticut Naval Weapons Station Yorktown, Virginia	Joint Base Pearl Harbor-Hickam, Hawaii Naval Base Guam (Joint Region Marianas) Naval Base Kitsap, Bangor, Washington Naval Base San Diego, California Naval Base Ventura County, Point Mugu, California

To provide Navy decision makers with sufficient information to plan and make informed decisions on the proposed CPS flight test program, this EA/OEA evaluates several environmental/resource categories within the affected environment that potentially could be impacted. For this assessment, the following eight environmental/resource categories were considered in detail: air quality, cultural resources, biological resources, geology and soils, water resources, hazardous materials and waste management, environmental justice, and health and safety. Because the environmental issues associated with the proposed CPS flight test program may vary at each affected location, the environmental/resource categories analyzed at each location also varied. Refer to **Section 1.6** for identification of resource categories not included in this assessment and those described and analyzed by location.

1.4 Relevant Laws and Regulations

As part of the preparation of this EA/OEA, the Navy conducted analyses, agency coordination and consultations, and public outreach based on laws, statutes, regulations, policies, and standards that are pertinent to implementation of the Proposed Action. Further discussion on key regulatory requirements and compliance is provided in **Chapter 5.0**.

The Navy is aware of the November 12, 2024 decision in *Marin Audubon Society v. Federal Aviation Administration* (FAA; *Marin Audubon Society v. FAA* 2024). To the extent that a court may conclude that the Council on Environmental Quality regulations implementing NEPA are not judicially enforceable or binding on this agency action, the Navy has nonetheless elected to follow those regulations at 40 CFR Parts 1500-1508, in addition to the Navy's procedures for implementing NEPA at 32 CFR Part 775, to meet the agency's obligations under NEPA.

1.5 Public and Agency Participation and Intergovernmental Coordination

Council on Environmental Quality regulations (40 CFR § 1506.6) direct proponents and lead agencies responsible for preparation of NEPA documents to involve the public and other agencies who may be interested or affected by the proposed actions. The following sections briefly describe agency and public involvement with the analysis and preparation of this EA/OEA. Detailed information about agency and public involvement can be found in **Appendix A, Public and Agency Involvement and Distribution** and **Appendix E, Agency Correspondence**.

Interagency and intergovernmental coordination is an integral part of EA/OEA preparation. As part of early coordination and consultations, the Navy notified and consulted with relevant agencies on the Proposed Action to identify potential environmental issues and regulatory requirements associated with project implementation. A list of agencies contacted during development of the EA/OEA is included in **Appendix A**.

In accordance with Council on Environmental Quality and Navy policy for implementing NEPA, the Navy solicited comments on the Draft EA/OEA from interested and affected parties. A Notice of Availability for the Draft EA/OEA, and the Draft Finding of No Significant Impact (FONSI), Finding of No Significant Harm (FONSH), was published in local and regional newspapers for locations associated with the Proposed Action (see **Table A.2.1-1** in **Appendix A**). Copies of the Draft EA/OEA and Draft FONSI/FONSH were placed in local repositories (see **Table A.2.1-3** in **Appendix A**) for public access and also made available over the Internet at <https://www.nepa.navy.mil/CPSSea-Based>.

Comments on the Draft EA/OEA were accepted over the 30-day public review period starting on June 3, 2024, as specified in the Notice of Availability. Written comments could be submitted using either of these two ways: (1) via the Internet at <https://www.nepa.navy.mil/CPSSea-Based> or (2) mailed to the following address:

Environmental Program Manager/SP2521
Strategic Systems Programs
1250 10th Street SE, Bldg. 200, Suite 3600
Washington Navy Yard, DC 20374-5127

Following the 30-day public review period, the Navy determined that preparation of an Environmental Impact Statement / Overseas Environmental Impact Statement (EIS/OEIS) was not required and decided to finalize the EA/OEA. The Navy prepared the Final EA/OEA with consideration of all public and agency comments received during public review of the Draft EA/OEA. All comments received on the Draft EA/OEA during the public comment period are available in **Appendix A, Section A.2.2**. The Final EA/OEA and FONSI/FONSH will be accessible via the internet at <https://www.nepa.navy.mil/CPSSea-Based>. A Notice of Availability for the Final EA/OEA and FONSI/FONSH will be published in newspapers in the United States and the RMI.

1.6 Environmental Resource Topics Included for Analysis

Impact analyses presented in this EA/OEA focus on issues or topics of importance or concern. Sixteen resource areas, or topics, were identified for consideration when evaluating the potential environmental consequences of the Proposed Action. Resource topics were retained for detailed analyses in this EA/OEA if (1) the environmental impacts associated with the topic were of critical importance, (2) a detailed analysis was necessary to make an informed selection among alternatives, (3) the environmental impacts associated with the topic are of particular interest or concern to the public or regulators, or (4) there were potentially significant impacts to the resource. Based on preliminary analyses, it was concluded that several resource topics would have negligible, insignificant impacts and did not meet the importance or interest criteria (**Table 1.6-1**). Depending on the location of proposed activities, up to eight resource topics were carried forward for detailed analyses in this EA/OEA (**Table 1.6-1**).

For resource topics not carried forward for detailed analyses, **Table 1.6-2** provides a brief resource description and the reason(s) it was not carried forward for detailed analysis of environmental impacts in this EA/OEA.

Table 1.6-1. Resource Topics Considered for Detailed Analysis

Resource Topic	Location within Study Area	
	Broad Ocean Areas Atlantic and Pacific	Kwajalein Atoll
Airspace Management	No	No
Air Quality (including Greenhouse Gases and Climate Change)	Yes	Yes
Noise	No	No
Cultural Resources	No	Yes
Biological Resources	Yes	Yes
Geology and Soils	No	Yes
Water Resources	No	Yes
Hazardous Materials and Waste Management	Yes	Yes
Land Use	No	No
Infrastructure and Utilities	No	No
Socioeconomics	No	No
Transportation	No	No
Environmental Justice	No	Yes
Visual Resources	No	No
Human Health and Safety	Yes	Yes
Coastal Zone Management	No	No

Note: Where resource topics have “No” listed for a portion of the study area, the resource topic was not carried forward for detailed analysis of environmental impacts in this EA/OEA for that location. Where “Yes” is listed, resource topics were carried forward for detailed analysis for that location in this EA/OEA.

Table 1.6-2. Justification for Resource Topics Not Carried Forward for Detailed Analysis

Resource Topic	Location within Study Area	
	Broad Ocean Areas Atlantic and Pacific	Kwajalein Atoll
Airspace Management	The Proposed Action would use airspace that is currently available for existing naval operations that occur in the Atlantic and Pacific study areas. Implementation of the Proposed Action would not require the establishment of new special use airspace routes, would not include proposed airspace modifications, and would not change the relationship of existing special use airspace with federal airways, uncharted visual flight routes, and airport-related air traffic operations. Proposed activities would be conducted following all relevant Federal Aviation Administration regulations/requirements for flight testing. A NOTAM would be published 15 days prior to activities conducted in the offshore airspace of the Sea Range. In addition, all project activities would be postponed until airspace within the project area was clear of non-participating aircraft. Therefore, any impacts on airspace management in the Atlantic and Pacific study areas would be negligible and insignificant.	
Noise	In the Atlantic and Pacific BOAs, intermittent aircraft and vessel noise as would be associated with the Proposed Action is a routine occurrence. Flight test personnel on vessels would follow current noise protection standard operating procedures (i.e., use of ear plugs, personal protective equipment, and safety distances) for flight tests. There would be no human noise receptors located at the Atlantic or Pacific BOA target sites or on floating targets. Therefore, any impacts from noise in the Atlantic and Pacific BOAs would be negligible and insignificant on non-wildlife receptors.	At Kwajalein Atoll, intermittent noise associated with a land-based payload impacts is a routine occurrence. No human receptors would be located on Illeginni Islet or in the KMISS range during payload impacts. Therefore, any impacts from noise on Illeginni Islet and in the KMISS range would be negligible and insignificant on non-wildlife receptors.
Cultural Resources	There are no identified cultural resources with the potential to be affected along the possible flight paths over the ocean or in the Atlantic and Pacific BOAs. Therefore, there would be no adverse effects to cultural resources within the Atlantic and Pacific BOAs from the CPS flight tests.	Carried Forward
Geology and Soils	In the Atlantic and Pacific BOAs, CPS flight test activities would not require ground disturbing activities. CPS AUR vehicle components would fall to the ocean floor and become embedded in the seafloor. The deposition of flight test materials would occur offshore in deep ocean waters. Vehicle materials buried beneath sediments may remain intact for decades where geochemical conditions would inhibit corrosion of the metal casing. Studies conducted at several Navy ranges where impact testing has occurred and at underwater munitions disposal sites in Hawai'i have shown that military expended materials have not resulted in water or sediment toxicity (Briggs et al. 2016, DON 2018a, DON 2022a). Therefore, there would be no expected adverse effects from the Proposed Action to geological and soil resources in the Atlantic or Pacific BOAs.	Carried Forward

Resource Topic	Location within Study Area	
	Broad Ocean Areas Atlantic and Pacific	Kwajalein Atoll
Water Resources	There are no groundwater or surface water resources in the Atlantic or Pacific BOAs that would be affected by the CPS flight tests. There would be no disturbance to ocean waters beyond the settling of the individual booster stages hundreds of miles apart as they come to rest on the seafloor after splashing into the ocean along the flight path and sinking thousands of feet. No impacts would occur to water resources within the Atlantic or Pacific BOAs from the CPS flight test.	Carried Forward
Land Use	In the Pacific and Atlantic BOAs, the CPS flight path would avoid populated land masses. There would be no changes or impacts from CPS flight tests to land use along the flight paths over or within the Atlantic and Pacific BOAs.	No changes to land use would occur from the CPS flight tests. Illeginni Islet and KMISS have served as the terminal impact site for numerous flight test programs and the CPS flight test activities are consistent with the current capabilities and land use at Kwajalein Atoll.
Infrastructure and Utilities	If CPS flight test activities restrict access, short-term negligible restrictions would occur to infrastructure in the Atlantic or Pacific study areas (e.g., maritime transportation, national security, energy and mineral extraction, fisheries and aquaculture, tourism, and recreation) from the Proposed Action.	At Kwajalein Atoll, the Proposed Action represents activities that are consistent with the missions there and well within the limits of current operations of RTS and USAG KA. There would be no impacts to infrastructure or utilities.
Socioeconomics	In the BOAs, mineral extraction sites may be impacted when and if CPS flight test activities restrict access to these sites; any changes in accessibility to those sites would be short-term (typically 1.5 to 4 hours per location). Commercial and recreational fishing may be affected when and if CPS flight test activities restrict access to fishing areas or if the CPS flight tests cause fish to abandon a popular fishing site. Aquaculture and tourism may also be affected. Because of these potential impacts, the Navy notifies the public about restricted areas and closures. Impacts on socioeconomics in the BOAs would be negligible and insignificant.	At Kwajalein Atoll, personnel conducting the CPS flight tests would reside only temporarily at USAG-KA, and the CPS flight tests would not employ any Marshallese citizens or contribute to the local Marshallese economy. There are no permanent residents at Illeginni Islet. Therefore, there would be no impacts to socioeconomics from the Proposed Action.

Navy CPS Weapon System Flight Tests EA/OEA
1.0 Purpose of and Need for the Proposed Action

Resource Topic	Location within Study Area	
	Broad Ocean Areas Atlantic and Pacific	Kwajalein Atoll
Transportation	In the BOAs, the Proposed Action would use airspace that is currently available for existing naval operations that occur in the Atlantic and Pacific study areas (i.e., U.S. Military installations, ranges, and range complexes). Vessel traffic and flight paths would be unaffected by the Proposed Action. CPS AUR flight would occur at high altitudes where it would be generally undetected by vessels or aircraft. Public NOTAMs and NTMs would be issued along the flight path to ensure the safety of both aircraft and vessels. Therefore, no impacts from the Proposed Action are expected to transportation services along the flight path in the Atlantic and Pacific study areas.	Vessel traffic and flight paths would be unaffected by the CPS flight tests at Kwajalein Atoll. Public NOTAMs and NTMs would be issued along the flight path to protect the safety of aircraft and vessels. The payload impact sites at Kwajalein Atoll do not have a resident population. Transport of CPS flight test materials, equipment, and personnel would occur using existing transportation methods. Proposed flight test activities are consistent with the mission and well within the limits of current operations of RTS and USAG-KA. There would be no impacts from the Proposed Action to transportation at Kwajalein Atoll.
Environmental Justice	Proposed activities in the BOAs would take place over and within the open ocean at least 50 nm from inhabited land areas. Since there are no human residents within the BOAs, there would be no disproportionate impacts to minority populations or low-income populations from CPS flight tests. Similarly, there would be no environmental health risks or safety risks for children in the BOAs because proposed activities would take place in the open ocean where no children are present.	Carried Forward
Visual Resources	Proposed activities would not involve any construction, demolition, or any land use changes. All activities, including vessel operations and flight testing, are consistent with activities that have occurred in the Atlantic and Pacific study areas for decades and will continue to occur into the foreseeable future. There would be no impacts to visual resources.	
Coastal Zone Management	The Atlantic BOA, Pacific BOA, and Kwajalein Atoll do not contain any coastal zone resources as defined under the Coastal Zone Management Act of 1972 and proposed activities in those areas would have no impacts on coastal zone management.	

Acronyms and Abbreviations: AUR = All-Up-Round, BOA = Broad Ocean Area, CPS = Conventional Prompt Strike, KMISS = Kwajalein Missile Impact Scoring System, nm = nautical miles, NOTAM = Notice to Air Mission, NTM = Notices to Mariners, RTS = Ronald Reagan Ballistic Missile Defense Test Site, USAG-KA = United States Army Garrison – Kwajalein Atoll.

2.0 Description of the Proposed Action and Alternatives

This EA/OEA provides an assessment of the Proposed Action and the No Action Alternative. Within this chapter for the Proposed Action, **Section 2.1** gives a detailed description of the CPS weapon system flight tests program, including information on the flight test vehicle, sea-based launch platforms, test areas, target sites, and flight test scenarios. **Section 2.2** provides a description of the No Action Alternative and other alternatives eliminated from further consideration. Lastly, identification of the Preferred Alternative is presented in **Section 2.3**.

2.1 Proposed Action

The proposed CPS weapon system flight tests would consist of up to eight flight test launches at up to eight different sea-based launch locations per year, conducted over a 10-year period beginning in fiscal year 2025. All flight tests would be at-sea missile tests launched from existing naval vessels while using ocean-based or land-based locations for targets. As mentioned in **Section 1.3**, the proposed flight tests would be conducted within broad Atlantic and Pacific study areas, which are delineated in **Figures 1.3-1** and **1.3-2**.

The flight tests would be supported by several existing U.S. military installations, ranges, and range complexes located in the Atlantic and Pacific Ocean regions. For the EA/OEA analysis, the designated study areas include the at-sea components of the ranges and range complexes. Apart from some island target locations, the land-based components and operations associated with these ranges are not included as part of the Proposed Action. Such land-based operations are part of ongoing logistical support and military readiness activities, including training, and Research, Development, Test, and Evaluation activities, which have been previously analyzed within various Navy Fleet and range complex EIS/OEISs listed in **Chapter 6.0**.

The detailed aspects of conducting the CPS flight tests are described in the following subsections.

2.1.1 CPS Flight Test Vehicle

The proposed CPS flight test vehicle design and operation is expected to be very similar to the test vehicles previously analyzed for the Joint Flight Campaign, which is a joint action between the Navy Strategic Systems Programs and the U.S. Army Rapid Capabilities and Critical Technologies Office (DON and U.S. Army 2022). Joint Flight Campaign flight tests 1 through 5 will be land-based launches only to help support development of the Navy's CPS flight test vehicle, the Army's Long Range Hypersonic Weapon, and the associated sea-based and land-based missile launch systems. Like the Joint Flight Campaign flight test vehicles currently undergoing testing, the CPS flight test vehicle missile body consists of a two-stage booster system and payload adapter. When combined with the payload, the vehicle is referred to as an

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all-up-round (AUR) missile. The AUR missile body is approximately 30 feet (ft) in length and 3 ft in diameter (**Figure 2.1.1-1**).

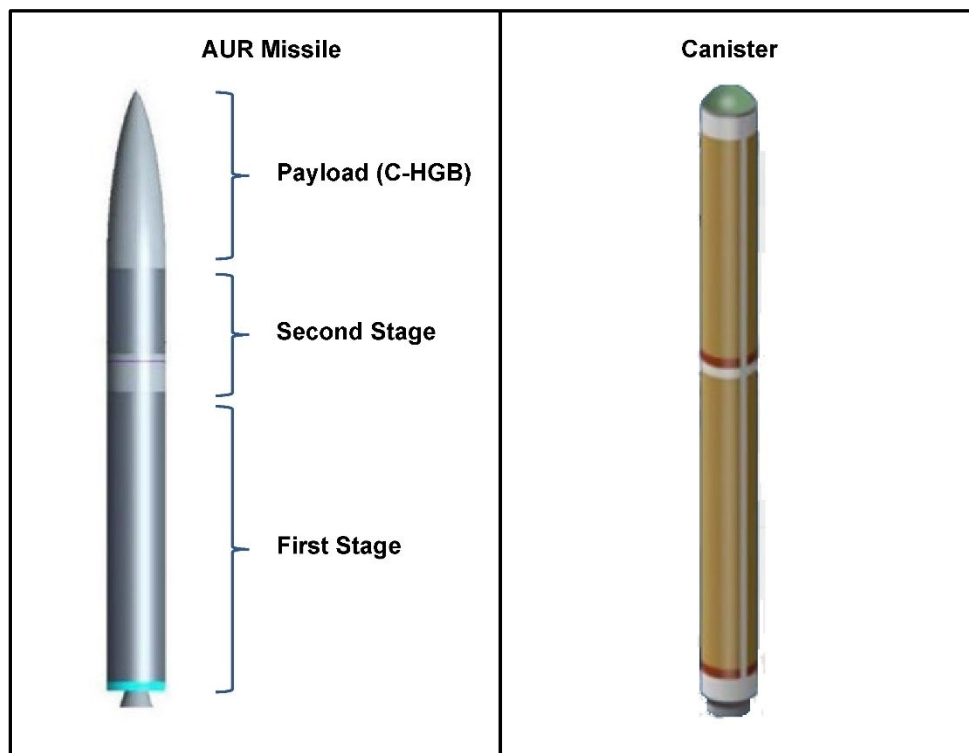


Figure 2.1.1-1. CPS Flight Test Vehicle and Canister

The AUR first and second stage rocket motors would contain a total of up to 20,000 pounds of rocket propellant. Other ordnance carried on the test vehicle is a Flight Termination System used only if the vehicle were to deviate from its course or should other problems occur during flight. The Flight Termination System serves as a destruct package that would stop forward thrust when activated, causing the vehicle to terminate flight and fall into the ocean. A list of characteristics for the missile body portion of the AUR is presented in **Table 2.1.1-1**.

Table 2.1.1-1. CPS Missile Body Characteristics

Major Components	Rocket motors, magnesium thorium, nitrogen gas, halon, asbestos
Communications	Various 5- to 20-watt radio frequency transmitters; one maximum 400-watt radio frequency pulse
Power	Up to 9 lithium-ion polymer and silver zinc batteries, each weighing between 3 and 40 pounds
Propulsion/Propellant	Rocket propellant and approximately 3 pounds of pressurized nitrogen gas
Other	Small electro-explosive devices for the Flight Termination System

A Common Hypersonic Glide Body (C-HGB) would be used as the missile payload (**Figure 2.1.1-1**), similar to that being tested on the Joint Flight Campaign flight tests. The C-HGB is a hypersonic glider designed to deliver a conventional payload. Once launched and released from the booster system in the upper atmosphere, the C-HGB would glide to a predetermined target location without any propulsion. The C-HGB would not contain any propellants or radioactive

materials. Flight test payloads may be conventional or may be inert and incorporate a mass simulator. A list of characteristics for the C-HGB is presented in **Table 2.1.1-2**.

Table 2.1.1-2. C-HGB Characteristics

Structure	Aluminum, steel, titanium, magnesium and other alloys, copper, fiberglass, chromate coated hardware, tungsten, plastic, Teflon, quartz, silicone
Communications	Two up-to 20-watt radio frequency transmitters
Power	Up to 3 lithium-ion polymer batteries and 1 thermal battery, each weighing between 3 and 50 pounds
Propulsion/Propellant	None
Other	Small electro-explosive devices for safety and subsystems operations

For safe handling and rapid fielding, the AUR would be encased in a launch canister (**Figure 2.1.1-1**). The function of the canister would be to protect the missile from damage during storage, transport, and loading onto naval vessels; and to help facilitate missile launch.

2.1.2 Sea-Based Launch Platforms and Support Ships

All proposed CPS flight tests would involve AUR launches conducted at sea from several existing naval surface ships and submarines that have been modernized to accommodate the new missile systems and launch canisters. All launches are expected to be conducted from surface and sub-surface firing platforms that are under the control of the Naval Sea Systems Command. Naval Sea Systems Command is responsible for developing, acquiring, delivering, and maintaining surface ships, submarines, unmanned vehicles, and other weapon system platforms; and oversees vessel operations.²

In addition to the sea-based launch platforms, other smaller ships and watercraft would be used in support of the CPS flight tests downrange. These support vessels would host various sensor systems, including telemetry and radar, and support target placement and recovery operations at designated target sites. Refer to **Section 2.1.4** for information on vessel operations downrange.

2.1.3 Launch Preparations and Operations

The proposed CPS flight tests would occur within the ocean study areas shown in **Figure 2.1.3-1** for the Atlantic region, and in **Figures 2.1.3-2** and **2.1.3-3** for the Pacific region. As was mentioned in **Section 1.3**, logistical and operational support for the launch vessels would be provided at various naval installations that are listed in **Table 1.3-1**. The locations of these installations are shown in **Figures 2.1.3-1** through **2.1.3-3**. With the exception of U.S. Naval Base Ventura County, Point Mugu in California, the launch vessels would be readied for testing at any of these locations prior to departure to a predetermined launch point in the BOA.

² For the purposes of this EA/OEA, the term “vessel” is inclusive of surface ships and submarines.

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Figure 2.1.3-1. Atlantic Study Area for Flight Tests

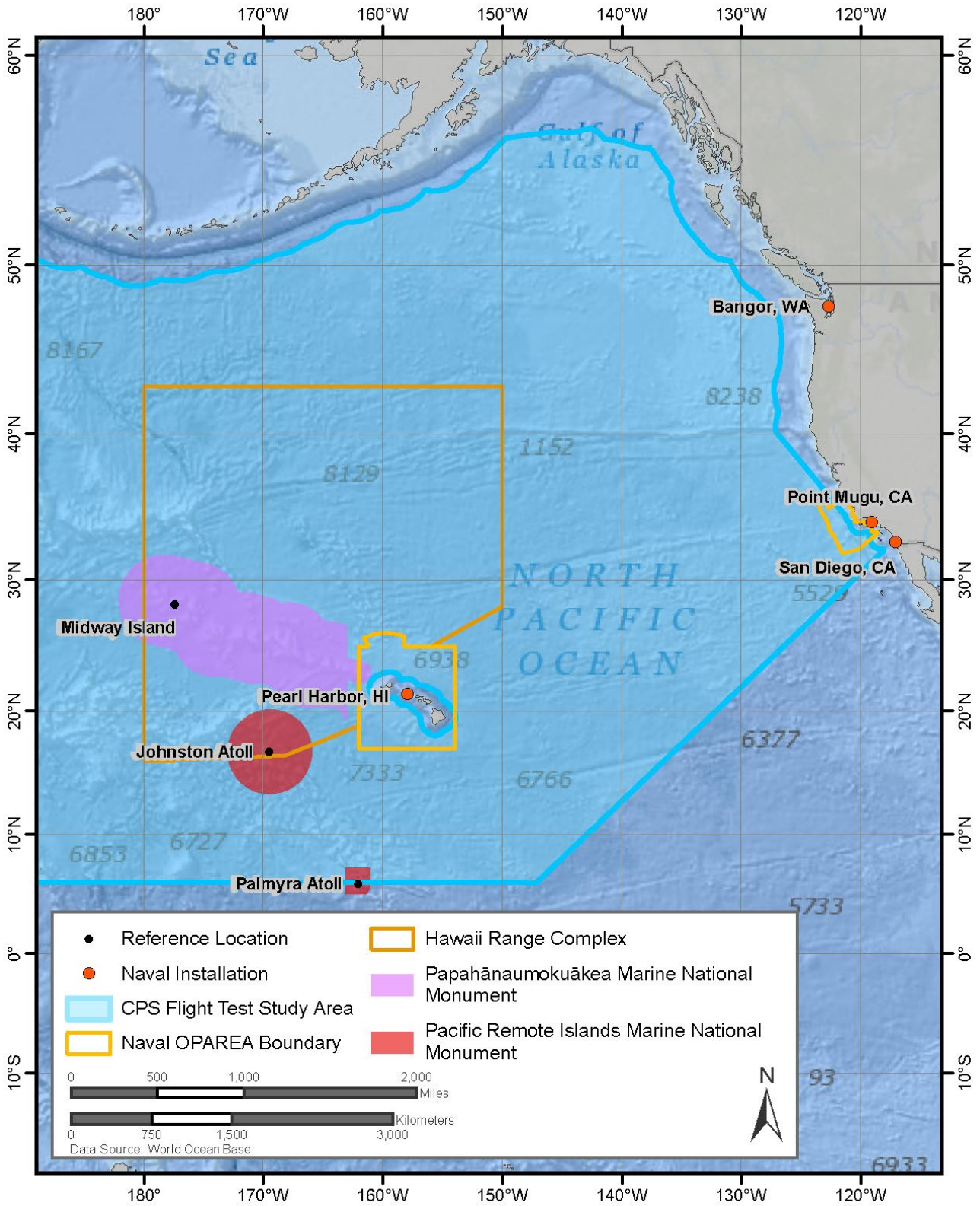


Figure 2.1.3-2. Pacific Study Area (East) for Flight Tests

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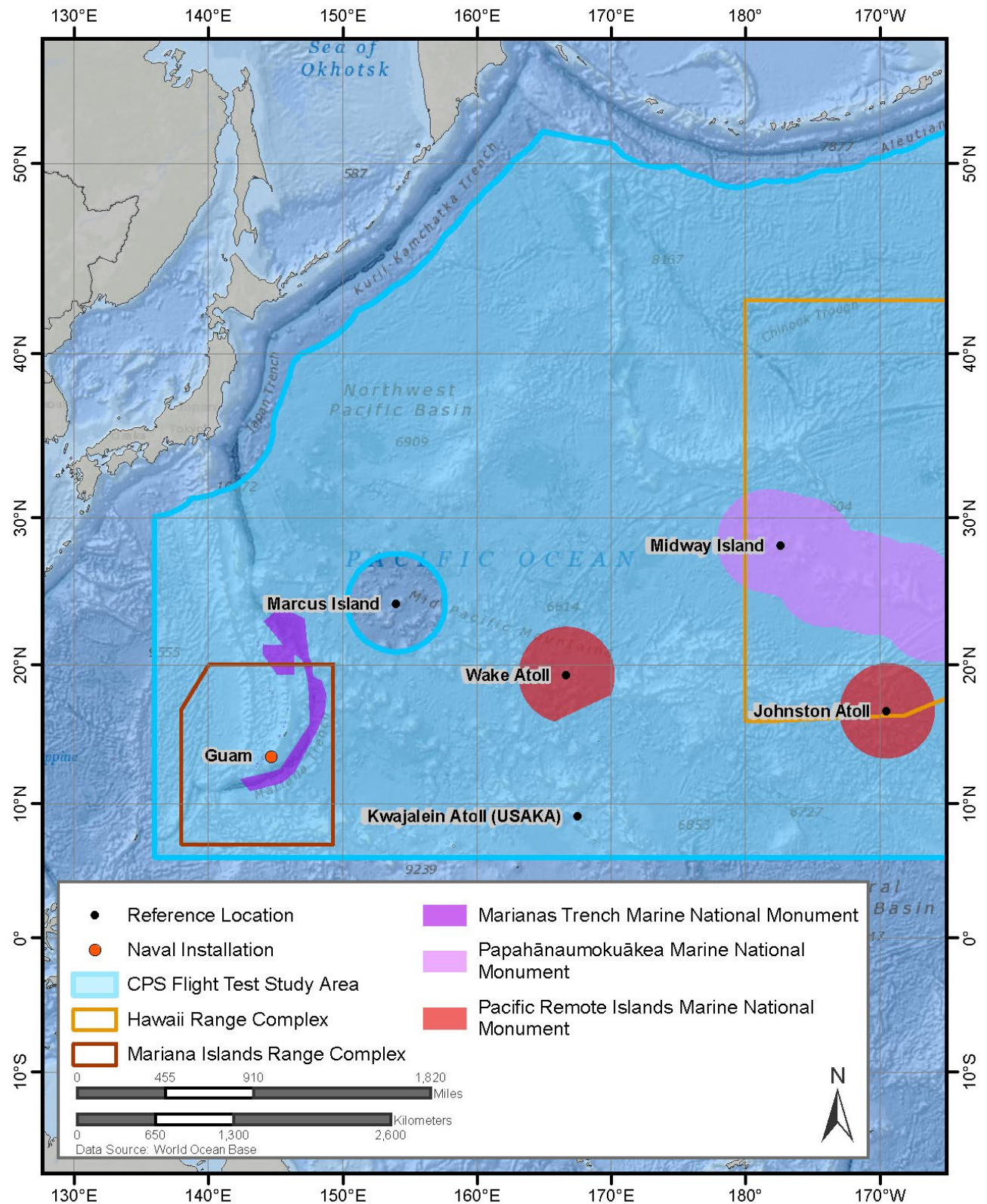


Figure 2.1.3-3. Pacific Study Area (West) for Flight Tests

The AUR canisters would be transported from the integration facility to the naval installation via truck or military aircraft in DoD and U.S. Department of Transportation approved shipping containers. To safeguard the AUR canisters from fire or other mishap, all transportation, handling, and storage of the components would be accomplished in accordance with applicable DoD, Navy, U.S. Air Force, and U.S. Department of Transportation policies and regulations. Each naval installation that would receive the AUR canisters has existing ordnance handling and storage facilities and standard operating procedures to ensure personnel and public safety. As previously mentioned, these types of logistical support and military readiness activities have been previously analyzed within the various Navy Fleet and range complex EIS/OEISs. As such, these land-based actions are not analyzed as part of the Proposed Action in this EA/OEA.

After a launch vessel departs and is in transit to the launch point in the BOA, CPS flight test activities would involve onboard pre-flight checks in preparation for launch. In addition to CPS flight test activities, crew members may conduct basic and routine unit-level activities such as surveillance and sonar training, and vessel maintenance. In some instances, the launch vessels may participate in fleet training exercises. Such routine activities and fleet exercises have also been previously analyzed within previous Navy EIS/OEISs. In all instances, vessels would be operated in accordance with applicable navigation rules, including international laws and regulations. Navy ships transit at speeds that are optimal for fuel conservation to maintain ship schedules and to meet mission requirements. Personnel are assigned to stand watch at all times, day and night, when vessels are moving through the water (underway) for safety of navigation, collision avoidance, range clearance, and man-overboard precautions. Environmental mitigation measures and standard operating procedures used by the Navy (see **Appendix C** for a list of measures relevant to the Proposed Action) benefit public health and safety, marine animals, and seafloor resources by identifying potential hazards and reducing the potential for vessel strikes.

The ocean study areas (**Figures 2.1.3-1 through 2.1.3-3**) for conducting the CPS flight tests include the airspace, ocean surface space, and undersea space. In all instances, test launches would be conducted at least 50 nautical miles (nm) offshore, usually within the existing naval operating areas (OPAREAs), sea ranges, and range complexes to maximize use of fleet assets. For some tests, however, launches could occur from more distant locations within the ocean study areas extending to 200 nm offshore. No launches are planned to occur within the marine national monuments or national marine sanctuaries located in the ocean study areas.

2.1.4 Downrange Preparations and Operations

For each flight test, there would be two to three additional support ships downrange from the launch point serving as host platforms for various sensors including telemetry and radar. A support ship and smaller watercraft would be used in the terminal area to support pre-flight test target placement/set-up, and post-flight test recovery and clean-up activities. Just as for the launch vessels described in **Section 2.1.3**, support ships and watercraft used downrange would operate in accordance with applicable navigation rules, including international laws and regulations, and monitor for marine mammals and sea turtles to avoid potential vessel strikes. Prior to downrange support ship and watercraft operations, Navy personnel would use the

Navy's Protective Measures Assessment Protocol to identify applicable environmental mitigation requirements which minimize potential impacts to protected marine species (see **Appendix C** for a list of measures relevant to the Proposed Action).

Depending on the particular trajectory for each flight test, existing fixed or mobile telemetry and radar sensors on land areas within view of the missile trajectory may be used. For mobile systems, there are no plans for the clearing of vegetation or ground disturbance. Such assets most likely would be operated within military installations.

A target site for the C-HGB would be at the terminal end of the CPS flight test. Target sites primarily would be located in the BOA in deep waters. In addition to BOA target sites, one island location in an established range operational area would serve as an occasional land-based target site. Most sea-based target sites would be within existing DoD sea-based ranges and range complexes located away from populated areas. All BOA target sites would be outside of exclusive economic zones (EEZs) in international waters. These sea-based and land-based target sites are further described in the following sections.

2.1.4.1 Broad Ocean Area Target Sites

In preparation for using target sites in the Atlantic and Pacific BOAs, the Navy may place self-stationing instrumented rafts around the targeted site for purposes of measuring and recording the C-HGB ocean impact. Equipped with radar, telemetry, and acoustic and optical sensors, the rafts would use battery powered trolling motors to maintain position; no anchoring systems would be used. Up to 12 sensor rafts would be deployed from a support ship prior to each flight test, which would then depart to a safe zone.

2.1.4.2 Floating Targets

For some target sites in the BOA, a floating target raft may be used. Floating target rafts would be pontoon rafts approximately 11 ft wide by 13 ft long (**Figure 2.1.4-1**). For flight tests involving a floating target raft, the raft would be deployed from a support ship prior to the flight test and would remain on-station for several hours using small electric motors. Target rafts would include several sensor types and scoring devices. A list of characteristics for the target raft is presented in **Table 2.1.4-1**.

Table 2.1.4-1. Target Raft Characteristics

Structural Components	Raft pontoons: high density polyethylene shell and urethane foam filler Raft frame: aluminum
Electronic Components	Sensors: hydrophones, pressure probes, camera system Electric motors Other electrical components: circuit boards, global positioning system, antennas, computer equipment, and copper electrical wiring
Power	Lithium-ion phosphate batteries
Other	Aluminum and steel plates

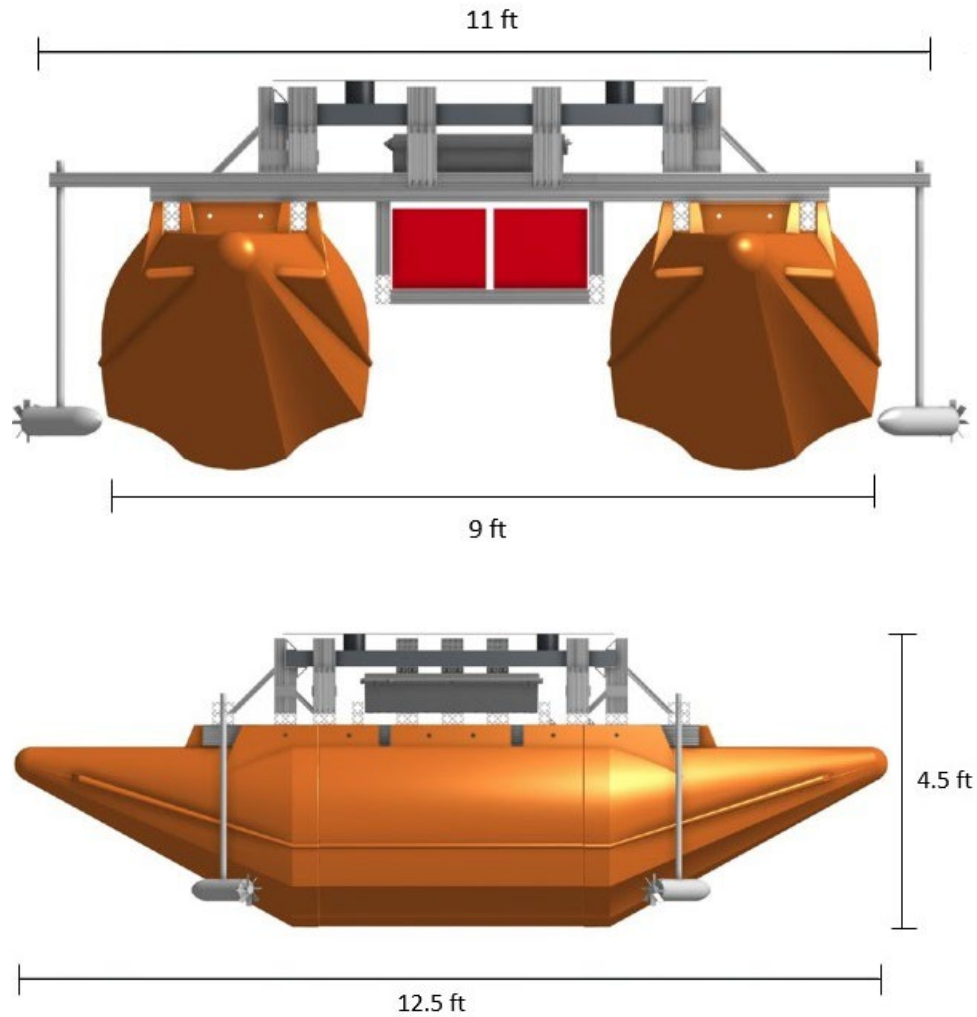


Figure 2.1.4-1. Notional Target Raft

2.1.4.3 Kwajalein Missile Impact Scoring System

Another deep-ocean target site being considered is the Kwajalein Missile Impact Scoring System (KMISS) located east of Kwajalein Atoll in the Republic of the Marshall Islands (RMI; **Figure 2.1.3-3**). KMISS, which is part of the Ronald Reagan Ballistic Missile Defense Test Site (RTS), is a deep-ocean range offshore Gagan Islet (**Figure 2.1.4-2**) with depths ranging from 7,000 to 12,000 ft. KMISS uses fixed underwater hydrophones to detect and locate surface impacts of missiles in all weather conditions (USASMDC 2014a). Use of KMISS for missile impact scoring has been previously analyzed by the U.S. Air Force for the Minuteman III and other missile programs (U.S. Air Force 2020a, U.S. Air Force 2021).

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2.1.4.4 Land-Based Target Site

For C-HGB land-based impacts, one target site is proposed at a Pacific region island located at RTS (i.e., Illeginni Islet) in the RMI (**Figure 2.1.4-2**). The land impact site is included as part of the proposed CPS flight tests so as to collect real-time performance data and critically important post-mission information. The Navy anticipates approximately one land impact per year would occur at Illeginni Islet throughout the flight test program's 10-year period.

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Illeginni Islet, Kwajalein Atoll in the RMI

Within Kwajalein Atoll, Illeginni Islet is one of 11 islets leased to the United States for U.S. Army Garrison–Kwajalein Atoll (USAG-KA) and RTS operations (**Figure 2.1.4-2**). Located on the west-central side of the atoll, Illeginni Islet is 31 uninhabited acres of land area with several buildings (some abandoned), towers, roadways, a helipad, and a dredged harbor area. The small islet has been used as a target site by the U.S. military for various hypersonic missile programs since the early 1990s. Such testing at the islet has been previously analyzed in several environmental documents (U.S. Air Force 2004, U.S. Air Force 2010, U.S. Air Force 2021, USASMDC 2011, DON 2019).

The CPS flight test target site at Illeginni Islet is an approximate 7.6-acre area on the west end of the islet that includes the helipad (**Figure 2.1.4-3**). The target site is non-forested and a C-HGB impact within the islet's forested area or in the adjacent reef and shallow waters would be unintentional and unlikely to occur.

To ensure the safe conduct of the flight tests for personnel at RTS, a Mid-Atoll Corridor impact area has been established across the atoll (**Figure 2.1.4-2**). When a point of impact is to occur in this area, a number of strict precautions are taken to protect personnel. Such precautions may consist of evacuating nonessential personnel and sheltering all other personnel remaining within the Mid-Atoll Corridor.

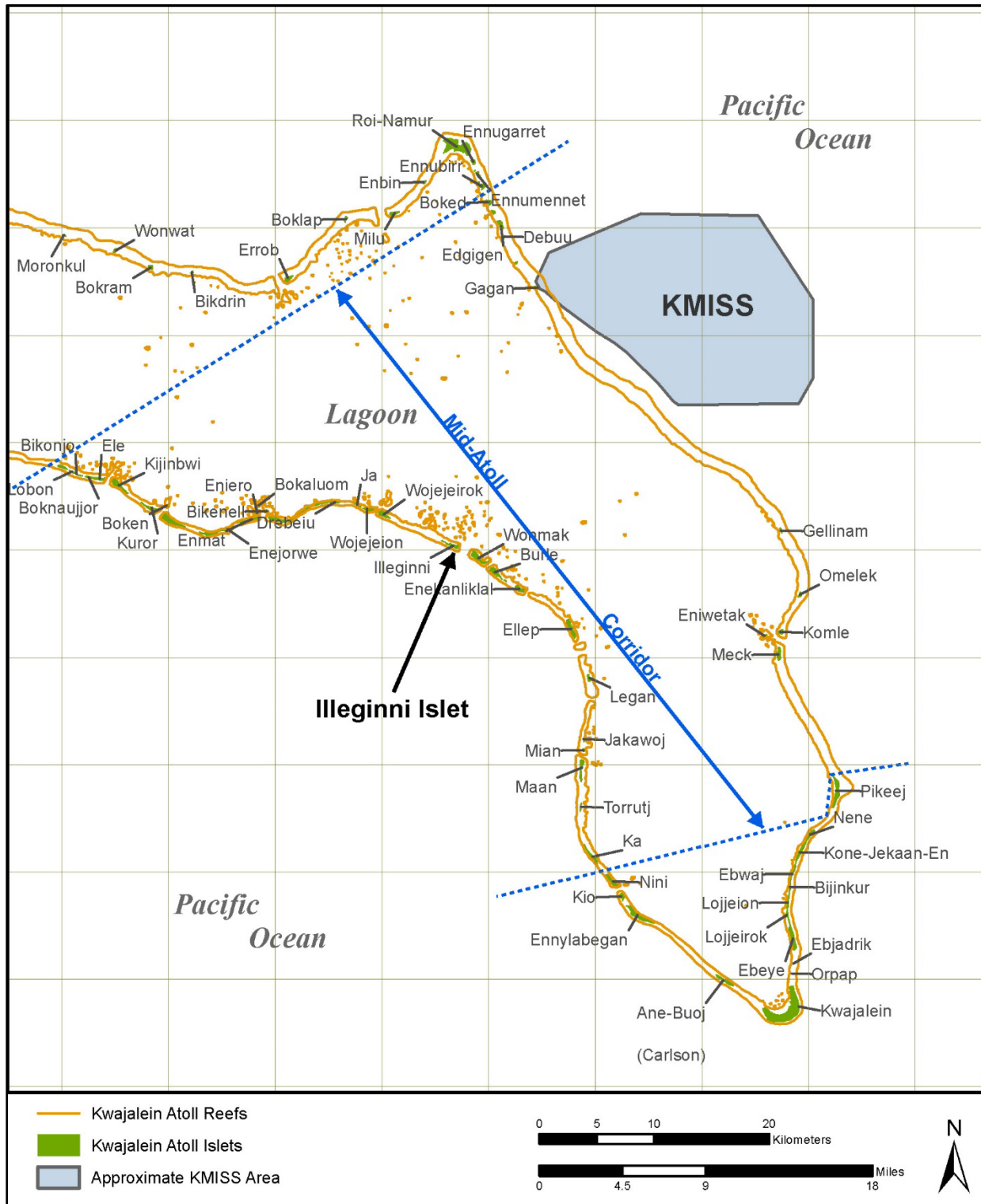


Figure 2.1.4-2. Kwajalein Atoll in the RMI



Figure 2.1.4-3. Illeginni Islet at Kwajalein Atoll in the RMI

2.1.5 Flight Test Scenario

As part of planning for each CPS flight test, range personnel would conduct a comprehensive safety analysis to determine specific launch and flight hazards associated with the test. Within days of each flight test, the FAA would issue Notices to Air Mission (NOTAMs) alerting the public to stay clear of the airspace hazard zones in the launch area and along the missile flight path. Additionally, the U.S. Coast Guard or Navy would issue Notices to Mariners (NTMs) alerting the public to stay clear of the ocean hazard zones. Within a day prior to launch, radar and other remote sensors would be used to verify that the hazard zones are clear of non-mission-essential aircraft, vessels, and personnel.

Once the launch vessel has reached the designated launch point in the BOA and is cleared by range safety to commence testing, the AUR would be launched. During the boost phase following launch of the AUR, the first-stage motor would burn out downrange and separate from the second stage. Farther into flight, the second stage would burn out and separate, then the payload adapter would be jettisoned from the C-HGB. Jettison of the second-stage booster and payload adaptor would occur outside the atmosphere. The spent booster stages and payload adapter would splash down in the BOA at different points downrange. All booster and payload adapter splashdown locations would be within the ocean study areas. First-stage boosters would splash down downrange of launch and as far as 330 nm offshore. Second-stage boosters and payload adapters would splash down outside of EEZs in international waters. The C-HGB would continue flying towards the predesignated sea-based or land-based target site before impact at the target sites.

The CPS missile flight paths would be designed to avoid Bermuda in the Atlantic, Marcus Island in the Pacific, and any other populated islands. Aside from the target sites at Kwajalein Atoll, no missile components are expected to splash down or impact within territorial seas or non-U.S. EEZs. Additionally, the Navy would plan all missile component splashdowns and payload impacts to avoid marine national monuments and national marine sanctuaries.

Based on data from other weapon system flight testing and on CPS weapon system design, the reliability rate of this developmental system is expected to be 80% during flight testing. Flight test failures would be expected no more than 20% of the time and would fall into four scenario categories presented in **Table 2.1.5-1**. If flight data were to indicate insufficient energy for the C-HGB to reach the target site, the vehicle could be directed to descend in a controlled termination into the BOA. All flight paths would be designed to ensure that, in the event of a failure, no CPS weapon system components or debris would descend into populated areas or marine protected areas.

2.1.6 Post-Flight Test Activities

Following completion of each CPS flight test, the launch vessel would depart from the launch point and continue normal operations before returning to port. Downrange, sensor support ships would also return to port. Post-flight test activities for each target site are described in the following sections.

Table 2.1.5-1. Flight Test Failure Scenarios

Scenario Number	Flight Test Failure Description	Results of Flight Test Failure	Post-Flight Test Response Actions
1	Flight test vehicle does not launch.	None. CPS AUR remains onboard the launch vessel.	None
2	Vehicle launches but there is no motor ignition. No auto destruct or command destruct is activated.	CPS AUR falls intact into the BOA, likely near the launch point. AUR would sink to the ocean floor.	Post-flight test clean-up and recovery. Recovery operations would be conducted to retrieve the payload or critical technologies if significant portions remain intact and if in waters less than 15,000 feet deep. Any visible debris found floating would be recovered, as much as practicable.
3	Vehicle launches but there is no motor ignition. Auto destruct or command destruct is activated using the Flight Termination System.	Intact CPS components or debris fall into the BOA, likely near the launch point. Debris would be large and small pieces. Most debris would sink to the ocean floor. It is unlikely that any pieces would float.	
4	Vehicle launches and motors ignite but the missile cannot reach the target site. Flight is terminated using command destruct.	Intact CPS components or debris fall into the BOA downrange. Debris would be large and small pieces. Most debris would sink to the ocean floor. It is unlikely that any pieces would float.	

Acronyms and Abbreviations: AUR = All Up Round, BOA = Broad Ocean Area, CPS = Conventional Prompt Strike

2.1.6.1 Broad Ocean Area Target Sites

For the sea-based target sites in the BOA, support ships would retrieve instrumented rafts and search for any floating debris before returning to port. All or most of the missile components would be expected to sink to the ocean bottom, including the spent booster stages. Any visible C-HGB or other missile debris found floating would be recovered, as much as practicable. During post-flight BOA searches after flight tests of similar systems, only the payload nose fairing segments (panels covering the payload) have been found floating and have been recovered; all other components sank to the ocean bottom.

In the event of a flight test failure, post-flight test clean-up and recovery operations would be conducted to retrieve portions of the payload or critical technologies that remain intact as described for the flight test failure scenarios in **Table 2.1.5-1**.

2.1.6.2 Floating Targets

For those flight tests involving a floating target raft, a support vessel would return to the BOA target site to retrieve the target. It is not planned or expected that target rafts would be sunk during flight test activities. Safety and other test support personnel would: (1) inspect the target raft for any hazards; (2) conduct an impact assessment of the raft and the test support equipment on the raft; and (3) recover any visible C-HGB or other test debris to the extent practicable. The raft would then be loaded onto a support ship for transport back to the appropriate port to remove the equipment, further evaluate damage to the raft, and determine whether the raft can be reused as a target.

The test would not involve any intentional sinking or abandonment of the target raft or test components on the target raft (e.g., sensors and motors). It is possible that material on the target raft might be inadvertently dislodged from the raft during a flight test. If materials were dislodged from the target raft, it is expected that most materials would sink (e.g., metal components) or be cleaned up during post-test operations if found floating (e.g., pontoon foam filler material). All lithium-ion batteries used on the target raft for sensor operation would be recovered unless they were inadvertently damaged beyond the point of safe retrieval/recovery. While there is some potential for the target raft to be sunk or for test materials on the raft to be dislodged or unrecoverable, it is considered unlikely that this would occur.

2.1.6.3 Kwajalein Missile Impact Scoring System

Following completion of a flight test at KMISS, a vessel or aircraft from USAG-KA would inspect the ocean impact site for any floating debris. Any visible C-HGB debris found floating would be recovered, as much as practicable. No debris would be retrieved from the ocean bottom.

2.1.6.4 Land-Based Target Site

For C-HGB impacts at the Illeginni Islet target site, Navy personnel would arrive via aircraft or surface vessel to first secure the area. Range safety personnel would then inspect the impact site for any hazards (e.g., residual unexploded ordnance from prior activities). Because the vehicle impact is expected to form a crater up to several feet in diameter, and eject soil over a wide area, personnel would be required to wear appropriate personal protective equipment. At Illeginni Islet, soil containing residual concentrations of beryllium, depleted uranium, and tungsten from prior intercontinental ballistic missiles and other flight tests could be scattered over the area (U.S. Air Force 2004, U.S. Air Force 2021, DON 2019). If necessary for personnel safety, the impact site would be wetted with water to stabilize the disturbed soil. Once the site is cleared for safe entry, other test support personnel would conduct an impact assessment of the site, and initiate cleanup and recovery operations. Any visible C-HGB debris would be recovered, as much as practicable. As part of recovery operations, loose soil material may need to be screened to retrieve vehicle debris. Any equipment brought on island during pre-flight test preparations would also be removed.

At Illeginni Islet, the crater may need to be backfilled and appropriate repairs made to any island structures. In addition, soil and groundwater samples would be taken at Illeginni Islet for testing, as needed, to ensure that concentrations of heavy metals, such as beryllium, uranium (as a surrogate for depleted uranium), and tungsten, do not exceed established UES standards (USASMDC 2024).

If a C-HGB were to inadvertently impact outside the island target site in adjacent shallow waters, divers in scuba gear would attempt to recover the debris manually. For an inadvertent impact off Illeginni Islet on the coral reef, reef flat, or in shallow waters less than 10 ft deep, an inspection by project personnel would occur within 24 hours. Representatives from the National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service (USFWS) would also be invited to inspect the site as soon as practical after the test. The inspectors would assess

any damage to coral and other natural and biological resources and, in coordination with Navy and USAG-KA representatives, decide on any response measures that may be required (DON 2019).

2.2 Alternative Actions Including the No Action Alternative

By integrating a series of existing ranges, OPAREAs, and BOAs as identified for the proposed CPS flight test study areas in both the Atlantic and Pacific Ocean regions, the Navy is provided the flexibility to meet diverse testing requirements and the distances needed to fully demonstrate the CPS weapon system performance before it can be certified for fleet use. To meet CPS program objectives for the Proposed Action, alternatives must satisfy the following criteria:

- Support sea-based launch areas and missile flight corridors which allow flight testing over the entire performance envelope required to fully demonstrate CPS weapon system performance.
- Support flight testing in both the Atlantic and Pacific regions to meet requirements for system certification for fleet use in both regions.
- Include viable sea-based payload target sites or architecture that meets CPS performance and safety requirements.
- Include viable land-based payload target site(s) that meet CPS program performance and safety requirements.
- Include target sites, land- or sea-based, with existing sensors capable of collecting the data required to demonstrate CPS payload system performance or sites suitable for deployment of required sensors.
- Locations which support initial CPS weapon system flight testing by fourth quarter of fiscal year 2025.

Only one alternative has been identified that meets the Navy screening criteria for the Proposed Action: the Preferred Alternative, or Proposed Action, as described in **Section 2.1**. The No Action Alternative, as described in this section, was also carried forward for analysis in this EA/OEA. Alternatives that were considered but not carried forward for analysis are discussed in this section.

2.2.1 Alternatives Considered but Not Carried Forward

2.2.1.1 Simulation and Laboratory Testing

Although computer simulations, modeling, and other laboratory tests are being applied to the design and early evaluation of the CPS weapon system, such methods cannot provide all of the information needed to satisfy mission requirements (e.g., verify system operation and performance). Alternatives that relied solely on such methods would not satisfy the purpose and need of the Proposed Action, and thus were eliminated from further consideration. The Navy

requires access to realistic environments to fully test the operational aspects and effectiveness of a new weapon system.

2.2.1.2 Land-Based Target Sites

To meet the CPS program objectives, test events must satisfy certain critical objectives, to include demonstrating weapon system effects on targets and demonstrating applicable design features and operating procedures. To accomplish these objectives and meet the purpose and need of the Proposed Action, land-based target sites are required for a subset of Navy CPS flight tests. As part of the alternative selection process for the Proposed Action, the Navy assessed available DoD land-based ranges in the Pacific and Atlantic study areas. The Navy did not identify any suitable land-based target sites in the Atlantic study area. The Navy identified two potential land-based target sites in the Pacific study area which were evaluated as potential alternatives for Navy CPS flight testing but not carried forward for analysis in this EA/OEA. The first was the island of Farallon de Medinilla, a part of the Navy's Mariana Islands Range Complex, and the second was San Nicolas Island, a part of the Navy's Point Mugu Sea Range.

2.2.1.2.1 Farallon de Medinilla

Farallon de Medinilla is an island in the Commonwealth of the Northern Mariana Islands. The DoD leases Farallon de Medinilla from the Commonwealth of the Northern Mariana Islands to conduct U.S. military training and testing activities. Farallon de Medinilla has been used as a live and inert gunnery, missile, and bombing range since 1971. The island has three target sites for military training and testing. For the Mariana Islands Range Complex, the Navy has a checklist of six criteria that training and testing programs must meet in order to utilize Farallon de Medinilla (COMNAVMARIANASINST 3500.4E). After conducting an evaluation of the suitability of Farallon de Medinilla as a land-based payload target site based on the criteria, the Navy determined that the Farallon de Medinilla range cannot support the specific requirements of CPS payload impact during the required flight testing timeframe. Furthermore, inclusion of Farallon de Medinilla as a land-based alternative target site in this EA/OEA would require additional permits, authorizations, and consultations that would not allow the Navy to meet the required need date for initiation of CPS flight testing. This alternative was not carried forward for analysis.

2.2.1.2.2 San Nicolas Island

A land target site at San Nicolas Island was also considered as an alternative land-based target site for CPS flight testing. San Nicolas Island is one of the Channel Islands off the coast of Southern California. The island is owned by the Navy and is part of the Naval Air Station Point Mugu Sea Range. The island serves as a training and testing location for the U.S. military and has extensive tracking and communications instrumentation in place to support testing (DON 2022a). San Nicolas Island has a single land impact site which has been used for DoD training and testing for decades (DON 2022a). After conducting an evaluation of the suitability of the San Nicolas Island land impact site for CPS flight testing, the Navy has determined that the

range at San Nicolas Island does not have sufficient size to support the requirements for CPS payload testing. Furthermore, San Nicolas Island was removed from consideration as an alternative land-impact site based on specific range safety criteria which would not meet CPS flight test land-based target site requirements.

2.2.1.3 Ocean-Based Floating Targets

To adequately demonstrate CPS payload system performance, a floating target or platform would be required for a subset of tests with BOA payload impacts. In addition to floating target rafts, the Navy considered a range of floating targets or platforms for use in CPS testing including existing surface ships that have been decommissioned by the Navy, and welded steel, oceangoing deck barges. Use of these target platforms would require that the ship or barge have various sensors installed on it and that it be towed into position at an ocean-based target site. Post-flight test, an oceangoing tug or other vessel would retrieve the decommissioned vessel or barge. If damage to the target ship or barge was too extensive, such that towing it to port would present a hazard to navigational safety for the tug or other vessels, then the damaged vessel may have been sunk in place. This sinking would have occurred in a manner similar to the Navy's Sinking Exercise program, also known as SINKEX (OPNAV M-5090.1).

2.2.1.3.1 Ships and Barges as Floating Targets

After conducting an evaluation of the suitability of using decommissioned Navy ships or deck barges for CPS payload targets, the Navy has determined that inclusion of decommissioned Navy ships and barges as target platforms as alternatives was not required to prove CPS weapon system performance and would not support initial CPS weapon system flight testing by fourth quarter of fiscal year 2025. Inclusion of decommissioned vessels and barges as floating targets in this EA/OEA would require additional marine species density modeling, permits, authorizations, and consultations that would not allow the Navy to meet the required need date for initiation of CPS flight testing. Therefore, decommissioned Navy ships and oceangoing deck barges were removed from consideration as alternatives in this EA/OEA. If the Navy decides to pursue the use of decommissioned vessels and barges as floating targets for future CPS flight testing, additional regulatory compliance would be conducted to include, at a minimum, additional NEPA analyses, permitting, and consultation with federal regulatory agencies.

2.2.1.3.2 Navy Sinking Exercise Program

After conducting an evaluation of the suitability of potential sinking of decommissioned Navy ships or deck barges for CPS payload targets, the Navy determined that sinking would need to be conducted under a SINKEX program and that sinking of target platforms was not required to prove CPS weapon system performance. The current Navy SINKEX program, per regulations under the general permit (40 CFR § 229.2) must be conducted a certain distance from land and in waters no less than a certain depth. This current SINKEX program would not support flight test requirements over the entire CPS flight testing performance envelope due to current operational range limitations. While the general permit issued per the Ocean Dumping Act would not constrain this action, conducting this action in the BOA would require consideration of

high seas not previously covered by a Navy Marine Mammal Protection Act authorization. To accomplish Marine Mammal Protection Act authorization for CPS flight testing involving sinking of a target Navy decommissioned vessel, additional marine species density modeling, permitting, authorizations, and consultations would be required. Completing these requirements would not allow the Navy to meet the required need date for initiation of CPS flight testing by fourth quarter of fiscal year 2025. Therefore, sinking of vessels under the SINKEX program was removed from consideration as alternatives in this EA/OEA. If the Navy decides to pursue incorporation of the SINKEX program into future CPS flight testing, additional regulatory compliance would be conducted to include, at a minimum, additional NEPA analyses, permitting, and consultation with federal regulatory agencies.

2.2.2 No Action Alternative

Under the No Action Alternative, the Navy's CPS sea-based flight test program as described in **Section 2.1** would not occur. However, ongoing Navy training and testing activities within existing naval OPAREAs, sea ranges, range complexes, and other areas, as described and analyzed in previous environmental documents, would continue. By not implementing the Proposed Action, the Navy would not be able to achieve the goal of proving that the new hypersonic weapon system meets all key performance requirements for deployment to sea-based platforms or operational use in a sea-based environment.

2.3 Identification of the Preferred Alternative

The Navy's Preferred Alternative is to implement the Proposed Action in both the Atlantic and Pacific Ocean regions as described in **Section 2.1** of this EA/OEA.

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3.0 Affected Environment

This chapter describes the environmental conditions in the Atlantic and Pacific study areas that could be affected by the Proposed Action and No Action Alternatives. In compliance with NEPA, Council on Environmental Quality, and 32 CFR § 775 guidelines, the information and data presented are commensurate with the importance of the potential impacts to provide the proper context for evaluating such impacts. Sources of data used and cited in the preparation of this chapter include past EAs and EISs, environmental resource documents and other related environmental studies, installation and facility documents and data, and information from regulatory agencies.

Sixteen resources areas or topics were considered for analysis as detailed in **Section 1.6**. Only the resource areas with potential substantial impacts or that meet the importance or interest criteria detailed in **Section 1.6** are described in this section and analyzed in detail in **Chapter 4.0**. See **Section 1.6** for a discussion of resource topics that were not included for detailed analysis in this EA/OEA.

3.1 Broad Ocean Area

Proposed CPS flight tests may occur within the Atlantic and Pacific study areas, which include the airspace, ocean surface, and undersea space in the area delimited in **Figures 2.1.3-1** through **2.1.3-3**. Locations for logistical and operational support for the launch platform vessels include several U.S. Naval installations as listed in **Table 1.3-1** and shown in **Figures 2.1.3-1** through **2.1.3-3**. Proposed flight test support activities may occur within existing U.S. Naval OPAREAs. These include the Narragansett Bay OPAREA, the Atlantic City OPAREA, the Virginia Capes OPAREA, the Navy Cherry Point OPAREA, the Charleston OPAREA, and the Jacksonville OPAREA (DON 2018a) in the Atlantic study area and the Point Mugu Sea Range, the Hawai'i Range Complex, and the Mariana Islands Range Complex in the Pacific study area.

The BOAs within the Atlantic and Pacific study areas are areas at least 50 nm from the territorial sea baseline where proposed activities may occur. This section includes detailed descriptions of air quality, biological resources, hazardous materials and waste management, and health and safety within the Atlantic and Pacific BOA affected environments for CPS flight tests. These resource areas were carried forward for additional analysis of environmental consequences in **Chapter 4.0**.

3.1.1 Air Quality –BOA

3.1.1.1 Region of Influence

The Region of Influence (ROI) for the BOA consists of much of the North Atlantic Ocean (**Figure 2.1.3-1**) and the North Pacific Ocean (**Figures 2.1.3-2** and **2.1.3-3**) where proposed activities would take place. With the exception of Kwajalein Atoll (see **Section 3.2.1**), no proposed activities would occur on or over land or over nearshore waters.

3.1.1.2 Affected Environment

Air quality in the BOAs is considered good due to the following: (1) dominant and strong winds; (2) no stationary air pollution sources; (3) ocean cargo and military vessels are dispersed over a very large area; (4) lack of topographic features to inhibit dispersion; and (5) aircraft are typically above the mixing height altitude. These features effectively widely disperse air emissions across the entire over-ocean missile testing area.

Ongoing change in either the mean state of the climate or in its variability in northern hemisphere lands and oceans has contributed to rising sea levels and retreating shores, increased storm intensity, increased precipitation, disruption of natural ecosystems, and human health effects. Changes in sea level have occurred throughout history, with the primary influences being global temperatures; Arctic, Antarctic, and glacial ice mass changes; and changes in the shape of the oceanic basins and land/sea distribution. Generally, with rising global temperatures, less ice is created or maintained throughout the Earth and sea levels rise. Currently, the islands of Bermuda, which are adjacent to but not within the ROI, are being affected to some extent by rising sea levels from global climate change. The islands and nations within the Pacific study area, including the Hawaiian Islands, Commonwealth of the Northern Mariana Islands, RMI, and Federated States of Micronesia, are being affected to some extent by rising sea levels from global climate change (DON and U.S. Army 2022).

Global aviation activities that occur throughout the various levels of the atmosphere contribute to climate change via the emission of greenhouse gases (GHG; of key importance, carbon dioxide [CO₂]) and ozone depleting substances (Lee et al. 2021). Over the last few decades, anthropogenic gases released into the atmosphere have decreased ozone concentrations in the stratosphere which filter harmful ultraviolet sunlight (NOAA 2024). A 2022 NOAA study suggested that a significant increase in spaceflight activity (including rocket launches) may damage the protective ozone layer. According to NOAA research, a 10-fold increase in hydrocarbon fueled launches, which is plausible within the next two decades based on recent trends in space traffic growth, would damage the ozone layer and change atmospheric circulation patterns (NOAA 2022e). A CPS flight test vehicle has the potential to travel through the troposphere, stratosphere, and the mesosphere zones depending on the trajectory selected.

3.1.2 Biological Resources – BOA

3.1.2.1 Region of Influence

The ROI for biological resources in the BOAs includes the areas subject to the effects of the Proposed Action. The ROI would be within the study areas as defined in **Section 2.1** and shown in **Figures 2.1.3-1** through **2.1.3-3**. Based on the scope of activities and the stressors associated with these activities, the ROI for biological resources is divided into two main areas:

- Ocean waters within the study areas and between 50 and 200 nm from land (within the U.S. EEZ) where vessel operations, vehicle launch, and stage 1 booster splashdown may occur; and

- Ocean waters within the study areas outside of EEZs in international waters where vessel operations, vehicle launch, vehicle overflight, component splashdown, and payload impact may occur.

3.1.2.2 Affected Environment

The biological resources affected environment in the Atlantic and Pacific BOAs have been described in detail in several recent NEPA compliance documents for DoD training and testing activities. Biological resources in the Atlantic BOA ROI are described in detail in the Atlantic Fleet Training and Testing EIS/OEIS (DON 2018a) and in the Joint Flight Campaign EA/OEA (DON and U.S. Army 2022). Biological resources in the Pacific BOA ROI are described in detail in the Hawaii-Southern California Training and Testing EIS/OEIS (DON 2018b), the Mariana Islands Training and Testing Supplemental EIS/OEIS (DON 2020a), and in the Joint Flight Campaign EA/OEA (DON and U.S. Army 2022). While the study areas for these documents do not overlap with the proposed BOAs completely, the affected environment described in these documents still represents the best available information for biological resources in the majority of the ROI, and the relevant sections of these documents are incorporated here by reference. This section provides a brief overview of biological resources in the ROI with a focus on special-status species and any differences in biological resources from those described in the aforementioned documents.

Marine Vegetation

Marine vegetation in the ROI includes diverse communities of thousands of species of primary producers (DON 2018a, DON 2018b). These primary producers reside in either open ocean or coastal water ecosystems and can live in either benthic or water column habitats within these ecosystems (DON 2018b). These primary producers include species of diatoms, dinoflagellates, coccolithophores, green algae, brown algae, red algae, blue-green algae, and vascular plants (DON 2018a, DON 2018b). In coastal waters where water depths are shallow enough (less than 660 ft) to allow sunlight to reach the bottom, some benthic (bottom) vegetation may occur; however, these habitats are limited in the ROI (DON 2018a). Most of the ROI is open ocean or continental shelf waters where water depths are greater than 660 ft and where marine vegetation lives only within the water column. Marine vegetation in the water column occurs within the photic zone (the sunlit portions) near the ocean surface (DON 2018a). The basic groups of producers which would occur in the water column of the ROI include microalgae (e.g., phytoplankton) and macroalgae (e.g., seaweed).

No Endangered Species Act (ESA) listed marine vegetation occurs within the ROI. However, marine vegetation is vital to the marine ecosystems in the ROI. These primary producers are the base of the marine food web, providing food, oxygen, and habitat for marine wildlife (DON 2015a). Highly productive areas are generally those with high diversity and abundance of marine vegetation which supports a diversity and abundance of marine wildlife. In the ROI, coastal waters have higher productivity than waters of the open ocean (DON 2018b).

One ecologically important group, *Sargassum*, occurs in the Atlantic BOA ROI and is managed under the Fishery Management Plan for Pelagic *Sargassum* Habitat (South Atlantic Fishery

Management Council 2002) due to its importance as Essential Fish Habitat (EFH) for several species (DON 2018a). *Sargassum* species float freely on the ocean surface and form clumps or large mats which are vital habitat for a number of marine species (DON 2018a). One species that depends on *Sargassum* habitat is the ESA-listed loggerhead sea turtle (*Caretta caretta*). Areas of *Sargassum* habitat have been designated as critical developmental and foraging habitat for young loggerheads and occur within the ROI (see the Environmentally Sensitive Habitats subsection).

Marine Wildlife

Wildlife habitat in the ROI includes a wide range of pelagic (water column) and benthic habitats. The diversity and abundance of marine wildlife vary greatly across the ROI depending on factors such as distance from land, water depth, substrate type, ocean currents, temperature, salinity, nutrient content, and primary productivity (DON 2018a, DON 2018b). In general, species richness and abundance are greater in coastal waters compared to the open ocean (DON 2018a, DON 2018b). However, productivity and species richness and abundance can also be relatively high near underwater features such as hydrothermal vents and seamounts (DON 2018b). The basic groups of marine wildlife in the ROI include invertebrates, fish, reptiles, birds, and marine mammals. Extensive descriptions of the threats to these groups of marine wildlife, as well as descriptions of their hearing and vocalization can be found in the documents described above (DON 2018a, DON 2018b) and are incorporated here by reference.

Invertebrates. Invertebrate communities in the ROI consist of thousands of species in both pelagic and benthic assemblages including some groups important to commercial and recreational fishing (DON 2018b). Diversity and abundance of both pelagic and benthic invertebrates are greater in continental shelf waters than in the open ocean due to higher productivity and availability of complex habitats (DON 2018b).

The ROI consists primarily of deep open ocean waters, many of which are beyond the continental shelves and are predominantly in very deep waters (0.6 to 3.7 miles deep; UNEP 2006). In these deep waters, the greatest diversity of invertebrates occurs in the epipelagic zone where available sunlight enables primary production by phytoplankton and algae (DARPA 2020, DON 2018b). Pelagic invertebrates in the ROI include protozoans, copepods, jellyfish, squid, and larvae of benthic invertebrates (DON 2018b). The abundance and distribution of zooplankton is seasonal and depends on temperature, salinity, nutrient availability, oxygen concentration, and food availability (DON 2009b). As a result, zooplankton is seasonally and spatially variable in the ROI with concentrations in areas of high primary productivity, including areas of upwelling (DON 2009b).

In the ROI, benthic invertebrate diversity and abundance are highest over the continental shelf (DON 2018a). Diversity and abundance of benthic invertebrates in the open ocean are low except for at some hydrothermal vents and cold seeps (DON 2018b). Other hotspots for diversity tend to occur near underwater features such as seamounts, submarine canyons, and shelf breaks where upwelling occurs (UNEP 2006). A high diversity of arthropod (e.g., crabs and lobsters), mollusk (e.g., snails, clams, and cephalopods), echinoderm (e.g., starfish and sea

urchins), cnidarian (e.g., coral and sea anemones), segmented worm, flatworm, roundworm, and sponge species are found in benthic habitats of the ROI (DON 2009b, DON 2018a). Fewer invertebrates occur in deep-water benthic habitats, but deep-water corals occur at depths between 160 and 9,840 ft on plateaus, edges of the continental shelf, bases of slopes, canyons, and seamounts (DON 2009b, DON 2018a, DON 2018b).

Fishes. Due to the large size of the ROI, there is a diversity of oceanic habitats for fish from epipelagic to deep benthic and seamount habitats, and therefore a wide diversity of fish species. These fish are vital components of the marine ecosystem and have substantial ecological and economic importance. In general, coastal areas where the habitat has structural complexity (i.e., reef systems, continental slopes, and deep canyons) and high productivity (areas of nutrient upwelling) support a greater diversity of fish species than open ocean areas (DON 2018a, DON 2018b).

Fish assemblages in the ROI are vital components of the marine ecosystem and have great ecological and economic importance. Major fisheries in the North Atlantic include several snapper-grouper species, mackerel, cobia, sharks, dolphinfish, and wahoo (South Atlantic Fishery Management Council 2020). Key U.S. commercial and recreational fisheries of the Pacific Ocean include dolphinfish, Pacific halibut, rockfishes and scorpionfishes, marlin, snappers, swordfish, wahoo, and tunas (NOAA 2022b). Fisheries within the U.S. EEZ are managed by NMFS and regional fisheries management councils.

Several ESA-listed fish species have the potential to occur in the ROI (**Table 3.1.2-1**). Most of these species occur only in coastal habitats. Several ESA-listed Distinct Population Segments (DPSs) or Evolutionarily Significant Units of sturgeon (*Acipenser oxyrinchus oxyrinchus*), salmon (*Oncorhynchus* spp.), and steelhead (*Oncorhynchus mykiss*) have the potential to occur in coastal waters (**Table 3.1.2-1**) during the marine phase of their life cycle. Fish from these ESA-listed populations are either unlikely to occur in the ROI or would occur there in very low densities seasonally. Of ESA-listed fish species with the potential to occur in the ROI, only the oceanic whitetip shark (*Carcharhinus longimanus*), oceanic giant manta ray (*Mobula birostris*), and scalloped hammerhead shark (*Sphyrna lewini*) are likely to occur in the open ocean portion of the ROI.

Marine Reptiles. Several sea turtle species have the potential to occur in the ROI. Populations of each of these species in the ROI are listed as threatened or endangered under the ESA (**Table 3.1.2-1**). Sea turtles are highly migratory, and each sea turtle species has unique life history characteristics which result in different patterns of distribution and abundance (see DON and USASMDC 2024).

Yellow-bellied sea snakes (*Pelamis platura*) also occur in the ROI where they are primarily found in pelagic habitats where they can be found in large groups associated with marine debris (DON 2018b).

Table 3.1.2-1. ESA-Listed Species with the Potential to Occur in the Atlantic and Pacific BOA ROI

Common Name	Scientific Name	ESA Listing Status	Occurrence in the Study Area			
			Atlantic Coastal Waters / Large Marine Ecosystem	Atlantic Open Ocean	Pacific Coastal Waters / Large Marine Ecosystem	Pacific Open Ocean
Fishes						
Atlantic sturgeon ¹	<i>Acipenser oxyrinchus oxyrinchus</i>	E, T ¹	NE U.S. and SE U.S.			
Oceanic whitetip shark	<i>Carcharhinus longimanus</i>	T	NE U.S., SE U.S., and Caribbean Sea	N Atlantic and Atlantic Subarctic	California Current and Insular Pacific	NC, E Tropical and Equatorial Pacific
Oceanic giant manta ray	<i>Mobula birostris</i>	T	NE U.S., SE U.S., and Caribbean Sea	N Atlantic and Atlantic Subarctic	California Current and Insular Pacific	NC, E Tropical and Equatorial Pacific
Chum salmon – Hood Canal Summer run ESU	<i>Oncorhynchus keta</i>	T			GOA and California Current	
Coho salmon ¹	<i>Oncorhynchus kisutch</i>	E, T			GOA and California Current	
Steelhead trout ¹	<i>Oncorhynchus mykiss</i>	E, T ¹			GOA and California Current	
Sockeye salmon – Snake River ESU	<i>Oncorhynchus nerka</i>	E			GOA and California Current	
Chinook salmon ¹	<i>Oncorhynchus tshawytscha</i>	E, T ¹			GOA and California Current	
Smalltooth sawfish	<i>Pristis pectinate</i>	E	NE U.S. and SE U.S.			
Atlantic salmon - Gulf of Maine DPS	<i>Salmo salar</i>	E	NE U.S.			
Scalloped hammerhead shark ¹	<i>Sphyrna lewini</i>	E, T ¹	Caribbean Sea	CN Atlantic	California Current, Western Insular Pacific	NC and E Tropical Pacific
Sea Turtles						
Loggerhead turtle ²	<i>Caretta caretta</i>	E, T ²	NE U.S., SE U.S., and Caribbean Sea	N Atlantic and Atlantic Subarctic	GOA, California Current, and Insular Pacific	NC, E Tropical, Equatorial, and Subarctic Pacific
Green turtle ²	<i>Chelonia mydas</i>	E, T ²	NE U.S., SE U.S., and Caribbean Sea	N Atlantic	California Current, Insular Pacific	NC, E Tropical, and Equatorial Pacific
Leatherback turtle	<i>Dermochelys coriacea</i>	E	NE U.S., SE U.S., and Caribbean Sea	N Atlantic and Atlantic Subarctic	GOA, California Current, and Insular Pacific	NC, E Tropical, Equatorial, and Subarctic Pacific
Hawksbill turtle	<i>Eretmochelys imbricata</i>	E	NE U.S., SE U.S., and Caribbean Sea	CN Atlantic	California Current and Insular Pacific	NC, E Tropical and Equatorial Pacific

Common Name	Scientific Name	ESA Listing Status	Occurrence in the Study Area			
			Atlantic Coastal Waters / Large Marine Ecosystem	Atlantic Open Ocean	Pacific Coastal Waters / Large Marine Ecosystem	Pacific Open Ocean
Sea Turtles (continued)						
Kemp's ridley turtle	<i>Lepidochelys kempii</i>	E	NE U.S., SE U.S., and Caribbean Sea			
Olive ridley turtle ²	<i>Lepidochelys olivacea</i>	E, T ²			California Current and Insular Pacific	NC, E Tropical and Equatorial Pacific
Birds						
Band-rumped storm-petrel – Hawaii DPS	<i>Oceanodroma castro</i>	E			Insular Pacific	NC, E Tropical, and Equatorial Pacific
Short-tailed albatross	<i>Phoebastria albatrus</i>	E			GOA, California Current, Insular Pacific	NC and Subarctic Pacific
Bermuda petrel	<i>Pterodroma cahow</i>	E	NE U.S. and SE U.S.	N. Atlantic		
Hawaiian petrel	<i>Pterodroma sandwichensis</i>	E			Insular Pacific	NC, Equatorial, and Subarctic Pacific
Newell's shearwater	<i>Puffinus auricularis newelli</i>	T			Insular Pacific	NC and Equatorial Pacific
Roseate tern ³	<i>Sterna dougallii</i>	E, T ³	NE U.S., SE U.S., and Caribbean Sea	N. Atlantic		
Marine Mammals						
Guadalupe fur seal	<i>Arctocephalus townsendi</i>	T			California Current	NC and E Tropical Pacific
Sei whale	<i>Balaenoptera borealis</i>	E	NE U.S., SE U.S., and Caribbean Sea	N Atlantic and Atlantic Subarctic	GOA, California Current, and Insular Pacific	NC, E Tropical, Equatorial, and Subarctic Pacific
Blue whale	<i>Balaenoptera musculus</i>	E	NE U.S., SE U.S., and Caribbean Sea	N Atlantic and Atlantic Subarctic	GOA, California Current, and Insular Pacific	NC, E Tropical, Equatorial, and Subarctic Pacific
Fin whale	<i>Balaenoptera physalus</i>	E	NE U.S., SE U.S., and Caribbean Sea	N Atlantic and Atlantic Subarctic	GOA, California Current, and Insular Pacific	NC, E Tropical, Equatorial, and Subarctic Pacific
Gray whale –Western North Pacific DPS	<i>Eschrichtius robustus</i>	E			GOA and California Current	Pacific Subarctic
North Atlantic right whale	<i>Eubalaena glacialis</i>	E	NE U.S. and SE U.S.	Atlantic Subarctic		
North Pacific right whale	<i>Eubalaena japonica</i>	E			GOA and California Current	NC, E. Tropical, and Subarctic Pacific
Steller sea lion – Western DPS	<i>Eumetopias jubatus</i>	E			GOA	Pacific Subarctic

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Common Name	Scientific Name	ESA Listing Status	Occurrence in the Study Area			
			Atlantic Coastal Waters / Large Marine Ecosystem	Atlantic Open Ocean	Pacific Coastal Waters / Large Marine Ecosystem	Pacific Open Ocean
Marine Mammals (continued)						
Humpback whale ⁴	<i>Megaptera novaeangliae</i>	E, T ⁴			GOA, California Current, and Insular Pacific	NC, E. Tropical, and Subarctic Pacific
Hawaiian monk seal	<i>Neomonachus schauinslandi</i>	E			Insular Pacific-Hawaii	
Sperm whale	<i>Physeter macrocephalus</i>	E	NE U.S., SE U.S., and Caribbean Sea	N Atlantic and Atlantic Subarctic	GOA, California Current, and Insular Pacific	NC and Subarctic Pacific
False killer whale – Main Hawaiian Islands Insular DPS	<i>Pseudorca crassidens</i>	E			Insular Pacific-Hawaii	

Acronyms and Abbreviations: C = Central, DPS = Distinct Population Segment, E (in ESA listing status) = ESA endangered, E (in occurrence) = East/Eastern, ESA = Endangered Species Act, ESU = Evolutionarily Significant Unit, GOA = Gulf of Alaska, N = North/Northern, S = South T = ESA threatened.

Note: Gray shaded cells indicate species or listed population does not occur in the portion of the ROI. Occurrence information primarily from DON 2018a, DON 2018b, DON 2020a, U.S. Army 2021, DON and U.S. Army 2022, and NOAA 2023b.

¹ Five ESA-listed DPSs of Atlantic sturgeon, four ESA-listed ESUs of coho salmon, eleven ESA-listed DPSs of steelhead trout, nine ESA-listed ESUs of chinook salmon, and four ESA-listed DPSs of scalloped hammerhead shark may occur in the ROI (see DON and USASMDC 2024 for details).

² Three ESA-listed DPSs of loggerhead turtle, six ESA-listed DPSs of green turtle, and two ESA-listed populations of olive ridley turtle may occur in the ROI (see DON and USASMDC 2024 for details).

³ Two ESA-listed populations of Roseate tern may occur in the Atlantic BOA ROI; the endangered U.S. Atlantic Coast south to North Carolina and the threatened Western Hemisphere and adjacent oceans populations.

⁴ Three ESA-listed DPSs of humpback whales may occur in the Pacific BOA ROI (see DON and USASMDC 2024 for details).

Birds. No terrestrial habitats occur within the ROI; therefore, birds in the study area are those that primarily forage in the open ocean: seabirds. Seabirds in the ROI include dozens of species, including species of ducks, loons, grebes, albatross, fulmars, petrels, shearwaters, storm-petrels, boobies, gannets, frigatebirds, tropicbirds, skua, and jaegers (DON 2018a, DON 2018b). Approximately 160 species of pelagic seabirds are found in the North Pacific Ocean alone (Drew et al. 2022). The feeding habits of these seabirds vary depending on species characteristics such as bill shape, wing shape, body mass, and preferred prey (DON 2018a). Some species forage on the ocean surface while others dive for prey. The ESA-listed Newell's shearwater (*Puffinus auricularis newelli*) is known to dive to depths of at least 100 ft to feed (DON 2018b). These seabirds spend the majority of their time at sea but nest in terrestrial coastal habitats or on oceanic islands. Species diversity and bird abundance are generally higher in coastal habitats than in the open ocean; however, some seabirds occur almost exclusively in the open ocean except when breeding. In the Atlantic ROI, species diversity is higher in the southern portion of the ROI, but seabird abundance can be higher in the northern portion due to the high productivity of northern waters (DON 2018a).

In addition to seabirds, millions of migratory birds from hundreds of species likely migrate through the Pacific and Atlantic study areas seasonally (DON 2018a, DON 2018b). Almost all seabirds and migratory birds in the ROI are protected under the Migratory Bird Treaty Act and many are USFWS birds of conservation concern (USFWS 2021a, DON 2018a, DON 2018b).

ESA-listed bird species occurring in the ROI (**Table 3.1.2-1**) are all seabird species that spend the majority of their time in the open ocean. These species may occur closer to land during the breeding season when they forage in waters closer to their nesting sites.

Marine Mammals. At least 40 marine mammal species are known to occur in the ROI, all protected under provisions of the Marine Mammal Protection Act. The most recent population information for the U.S. EEZ stocks of these marine mammals can be found in the NMFS Marine Mammal Stock Assessments (NMFS 2024a). Detailed distribution and density information for these species can also be found in the Navy's Marine Species Density Databases for the Atlantic Fleet Training and Testing (Roberts et al. 2023, DON 2017c), Hawaii-Southern California Training and Testing (DON 2024, DON 2017b), and the Mariana Islands Training and Testing (DON 2018c) study areas. Species diversity and density are higher in shelf waters of the ROI and a number of biologically important areas for cetaceans occur in continental shelf waters (Harrison et al. 2023, Ferguson et al. 2015). As with other marine wildlife, marine mammal density and distribution shift seasonally. Most baleen whales are highly migratory, tracking the distribution of high-density prey items, while other cetaceans have primarily resident populations with relatively small seasonal shifts in density (DON 2018a). Pinnipeds primarily occur in coastal and continental shelf waters, but some migrate through the open ocean (DON 2018a, DON 2018b). Northern fur seals (*Callorhinus ursinus*) and northern elephant seals (*Mirounga angustirostris*) are both species that forage in deeper waters and are more likely to occur in the open ocean portions of the ROI (U.S. Army 2021).

Several ESA-listed cetacean and pinniped species have the potential to occur in the ROI (**Table 3.1.2-1**). Hawaiian monk seals (*Neomonachus schauinslandi*) and the false killer whale (*Pseudorca crassidens*) Main Hawaiian Islands Insular DPS would occur only in EEZ waters around the Hawaiian Islands. Several other species (i.e., Guadalupe fur seal, gray whale, North Pacific right whale, and humpback whale) are found primarily within EEZ waters but may migrate through or forage seasonally within the open ocean.

Environmentally Sensitive Habitats

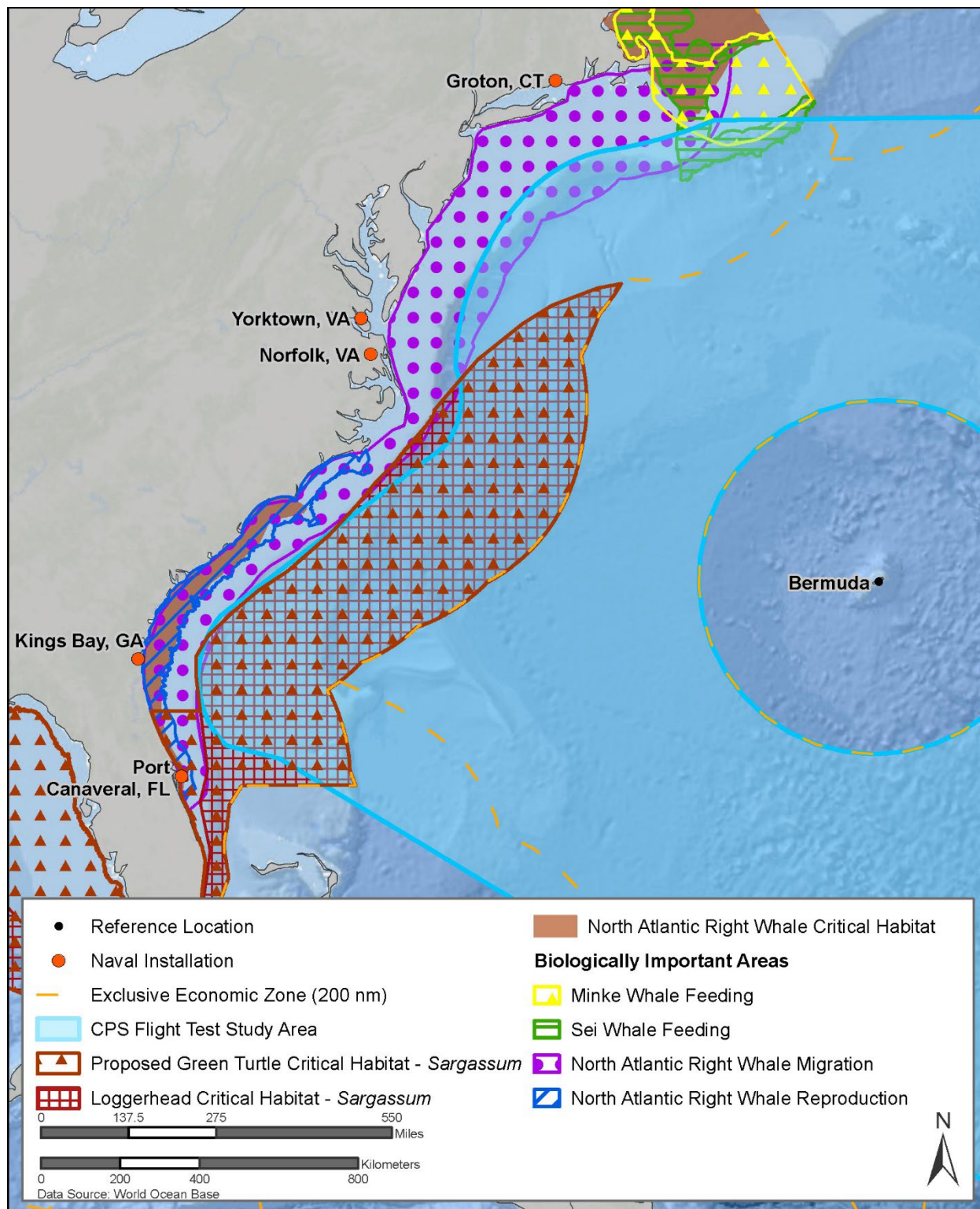
Critical Habitat. Habitat designated as critical habitat under the ESA only occurs within U.S. EEZs. One designated critical habitat area and one proposed critical habitat area, both *Sargassum* habitat for sea turtle species, occur in the Atlantic BOA ROI (**Figure 3.1.2-1**). In the Pacific study area, designated critical habitat for leatherback sea turtles (*Dermochelys coriacea*) as well as for the Central America DPS and Mexico DPS of humpback whales (*Megaptera novaeangliae*) occurs in coastal waters offshore of California (**Figure 3.1.2-2**); however, the Navy has excluded these critical habitat areas from proposed launch and component splashdown areas.

Designated and proposed critical habitats are described in detail in the Navy CPS Marine Biological Evaluation (DON and USASMDC 2024).

Biologically Important Areas. Biologically important areas are areas considered important to a species for all or part of the year. These areas are generally based on compilation of the best available information from scientific literature, unpublished species accounts, and expert knowledge to identify areas shoreward of the U.S. EEZs that are important reproductive, feeding, or migratory areas for species or groups (Ferguson et al. 2015, Harrison et al. 2023).

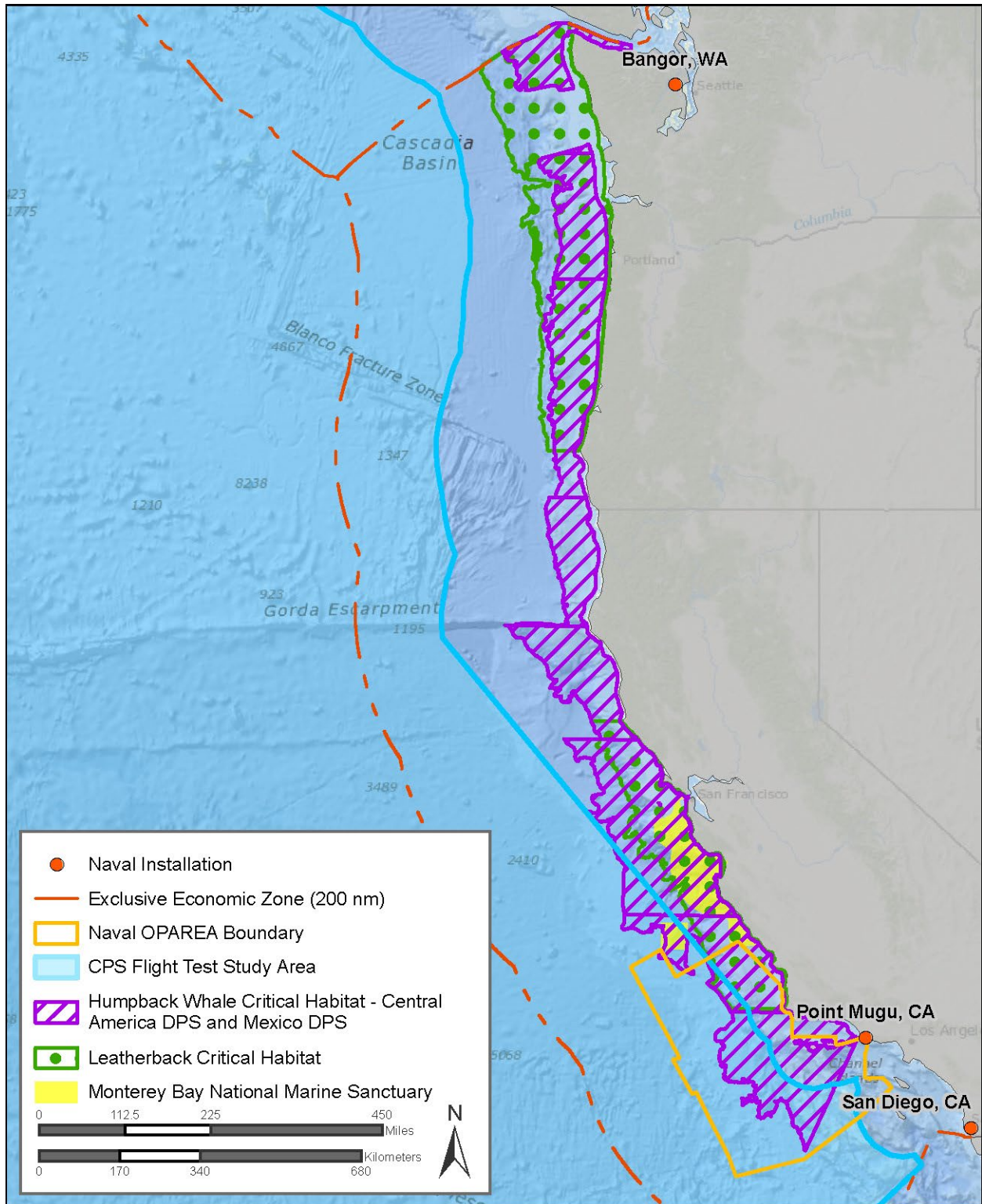
Biologically important areas for sei whale (*Balaenoptera borealis*) and minke whale (*Balaenoptera acutorostrata*) feeding and for North Atlantic right whale (*Eubalaena glacialis*) migration occur in the CPS Atlantic study area (**Figure 3.1.2-1**; Ferguson et al. 2015) but have been excluded from proposed launch and component splashdown areas. Biologically important areas for gray whale (*Eschrichtius robustus*) migration and humpback whale feeding occur within the Pacific study area in coastal waters near Point Mugu.

The deepwater canyons of the ROI support a diversity of hard and soft deep-sea corals (Packer et al. 2007) and include canyons in the Frank R. Lautenberg Deep Sea Coral Protection Area and the Georges Bank Coral Closure Area (**Figure 3.1.2-3**). Within these protected areas, commercial fishermen are prohibited from using most types of bottom-tending fishing gear such as trawls, dredges, bottom longlines, and traps to protect the slow-growing corals (50 CFR § 648.372; 86 Federal Register [FR] 33553 [June 25, 2021]). The submarine canyons are highly productive areas that not only provide habitat for deep-sea corals but provide feeding grounds for pelagic species, including dolphins, whales, and turtles; highly migratory fish, such as sharks, billfish, and tuna; and seabirds (DON and U.S. Army 2022).



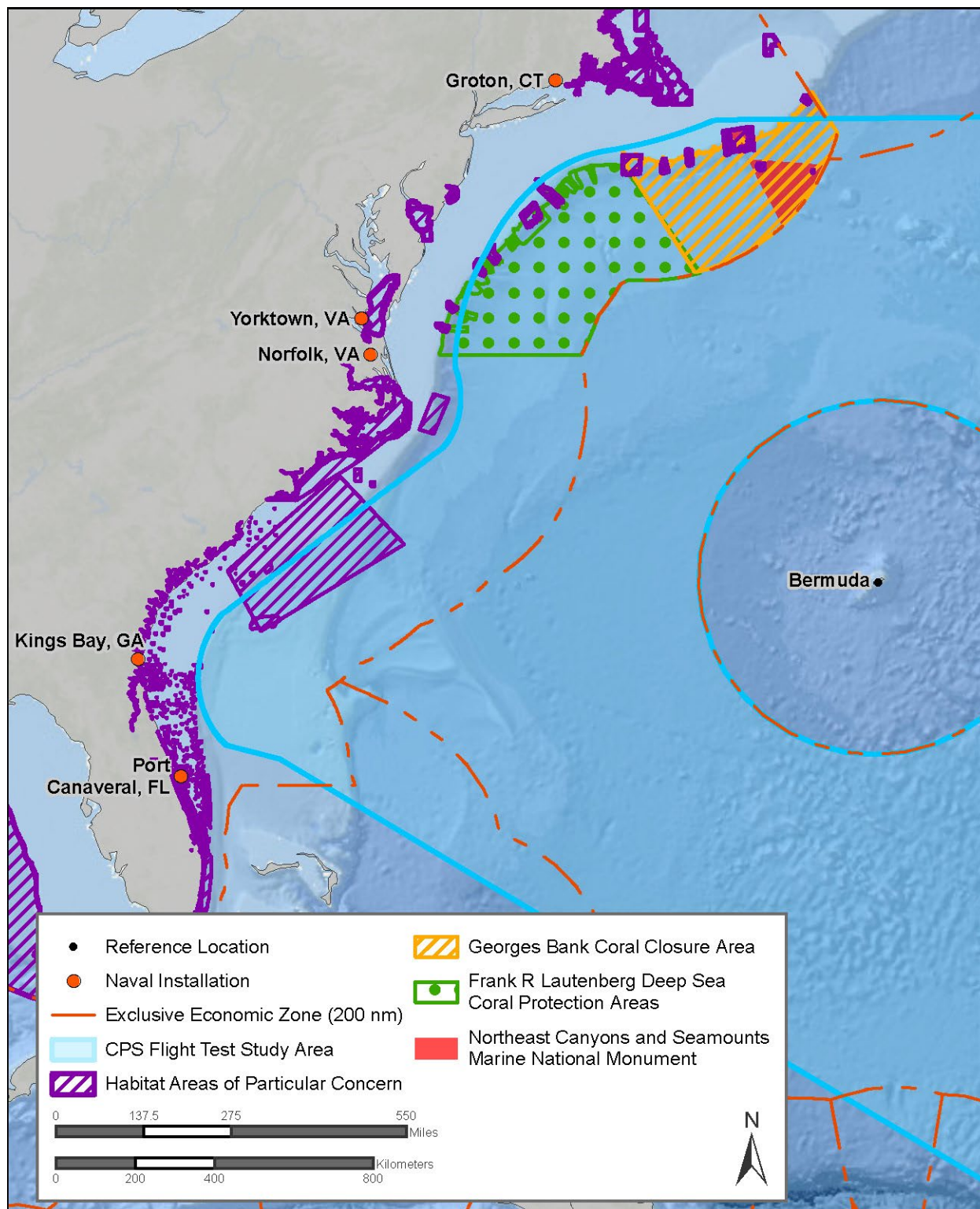
Data Source: Esri World Ocean Basemap

Figure 3.1.2-1. Designated Critical Habitat and Biologically Important Areas in the Atlantic BOA ROI



Data Source: Esri World Ocean Basemap

Figure 3.1.2-2. Designated Critical Habitat and Marine Protected Areas in the Eastern Pacific BOA ROI



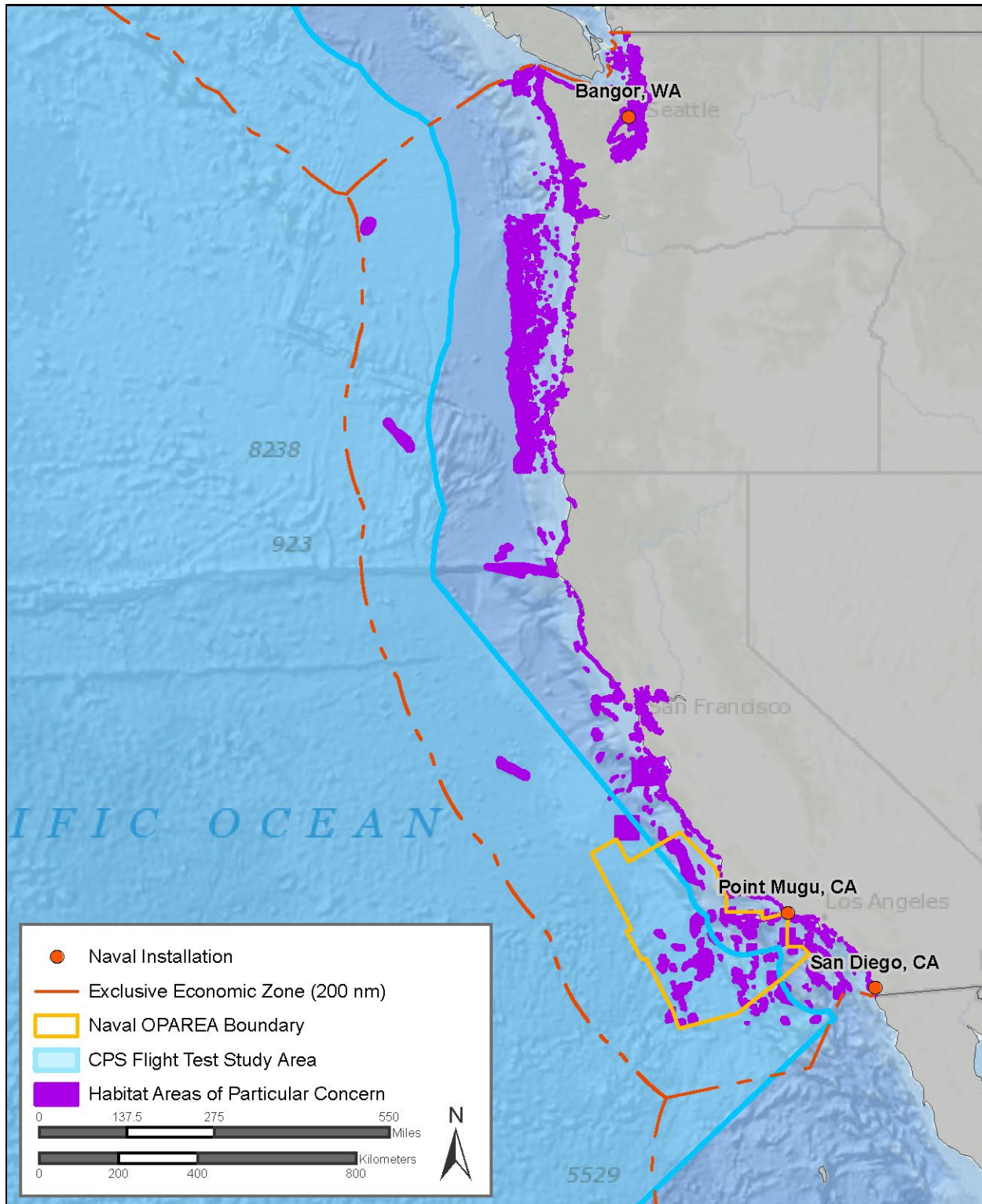
Data Source: Esri World Ocean Basemap

Figure 3.1.2-3. Habitat Areas of Particular Concern and Other Marine Protected Areas in the Atlantic BOA ROI

Seamounts. Seamounts are located throughout the North and Central Pacific within the study area. Seamounts are underwater bathymetric features which create biological hotspots by altering the flow of water above them which creates upwelling of cold, nutrient-rich waters and by providing sessile fauna with hard substrates for attachment (Morgan et al. 2015, Nishizawa et al. 2015). Studies of the Emperor Seamount chain, which spans from the Aleutian Trench to the Northwestern Hawaiian Islands, indicate that seamounts in the North Pacific Ocean are ecologically and commercially important areas (Morgan et al. 2015, Nishizawa et al. 2015, Miyamoto and Kiyota 2017, McClain et al. 2010). Seamounts in the North Pacific Ocean support commercial fisheries that target bottomfish such as North Pacific armorhead (*Pseudopentaceros wheeleri*) and splendid alfonsino (*Beryx splendens*; Miyamoto and Kiyota 2017). The productive waters associated with these seamounts also help support populations of seabirds like the Laysan albatross (*Phoebastria immutabilis*) and black-footed albatross (*Phoebastria nigripes*), which tend to forage and aggregate around seamounts due to higher prey density (Nishizawa et al. 2015). Several seamounts in the ROI are managed and have special protections under the Magnuson-Stevens Fishery Conservation and Management Reauthorization Act as Habitat Areas of Particular Concern (see the Essential Fish Habitat subsection).

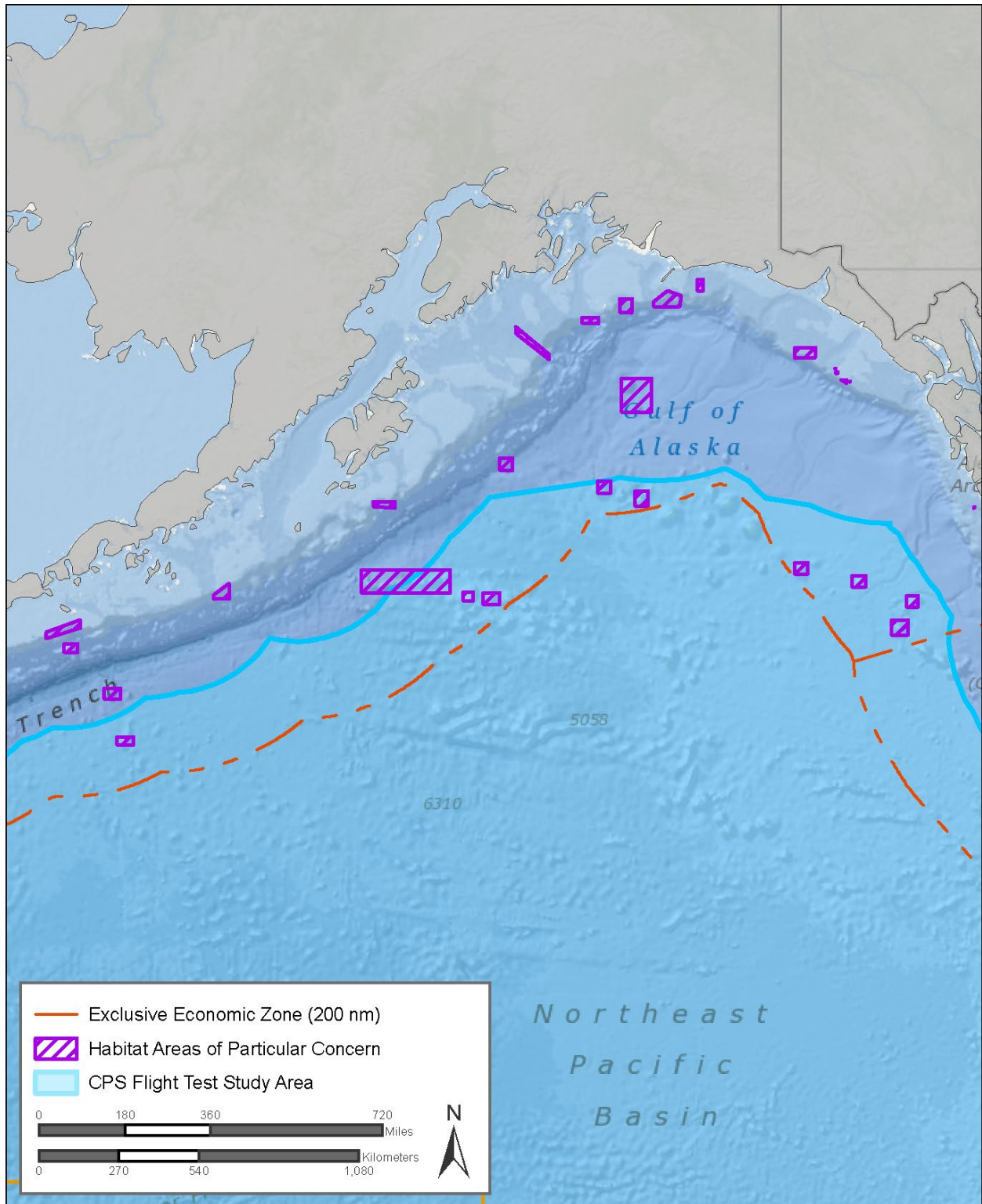
Essential Fish Habitat. EFH has been designated within the U.S. EEZ offshore of the entire U.S. Coast. These offshore areas provide important habitat for numerous fish and invertebrate species and are ecologically and economically important. The number of fish species and life stages with designated EFH in this area is quite extensive and is detailed in several DoD training and testing documents (DON and U.S. Army 2022, DON 2009b, DON 2018a, DON 2018b, DON 2020a, U.S. Army 2021). Given the limited potential for the Proposed Action to affect EFH (see **Section 4.2.1.2**), EFH in the ROI is only briefly summarized in this section.

In general, fisheries management councils designate EFH for marine species for separate life stages: eggs, larvae, juveniles, adults, and spawning adults. In addition to fish, macroalgae such as *Sargassum* and invertebrates such as octopus, squid, crabs, lobsters, scallops, and precious corals also have designated EFH (U.S. Regional Fishery Management Councils 2023). The EFH in the ROI includes benthic habitats (e.g., rocks, gravel, cobbles, sand, etc.), structure habitat (e.g., artificial reefs, shipwrecks, natural sponge and coral habitats), *Sargassum* habitat (pelagic mats of *Sargassum* spp.), Gulf Stream habitat, and water column habitat (DON 2009b). Several species with designated EFH also have designated Habitat Areas of Particular Concern within the ROI (**Figures 3.1.2-3** through **3.1.2-5**). Habitat Areas of Particular Concern are areas within EFH that are of particular ecological importance to the long-term sustainability of managed species, are of a rare type, or are especially susceptible to degradation or development. Designated Habitat Areas of Particular Concern in the Atlantic BOA ROI include coral reef and hard bottom, snapper-grouper, dolphin-wahoo, juvenile cod, canyon, and seamount habitat areas, all designated within the U.S. EEZ. Designated Habitat Areas of Particular Concern in the Pacific BOA ROI include several seamounts, rocky reefs, and Cherry Bank habitats of the U.S. West Coast (**Figure 3.1.2-4**) and seamount habitat protection areas in the EEZ offshore of Alaska (**Figure 3.1.2-5**).



Data Source: Esri World Ocean Basemap

Figure 3.1.2-4. Habitat Areas of Particular Concern along the U.S. West Coast



Data Source: Esri World Ocean Basemap

Figure 3.1.2-5. Habitat Areas of Particular Concern in the Pacific Ocean ROI near Alaska

Marine National Monuments and Sanctuaries. Several marine national monuments and national marine sanctuaries occur within the BOA ROI. All marine national monuments and national marine sanctuaries are designated within the U.S. EEZ.

In the Atlantic, the Northeast Canyons and Seamounts Marine National Monument (**Figure 3.1.2-3**) consists of approximately 4,913 square miles and includes three canyons and four seamounts and is home to at least 54 species of deep-sea corals (NOAA 2022a). The canyons and seamounts in the Monument cause areas of upwelling which lift nutrients which fuel growth of phytoplankton and zooplankton to make this a highly productive area (NOAA 2022a). The entire monument is protected with prohibitions on activities such as oil, gas and mineral exploration and development; removing, injuring, or damaging monument resources; placing or abandoning structures or material on the submerged lands; and most commercial fishing (NOAA 2022a).

Marine national monuments in the Pacific study area include Papahānaumokuākea around the Hawaiian Islands, Remote Pacific Islands around seven Pacific islands and atolls (**Figure 2.1.3-2**), and Mariana Trench in the Northern Mariana Islands (**Figure 2.1.3-3**). These large conservation areas are hotspots of species diversity and abundance in the Pacific (NOAA 2021). Several nationally and internationally endangered, threatened, and depleted species thrive at these monuments, including giant clams, pearl oysters, coconut crabs, fishes, reef sharks, sea turtles, and marine mammals (NOAA 2021). The monuments also provide important migratory shorebird and seabird habitat. Kingman Reef and Palmyra Atoll support higher levels of coral diversity (180–190 species) than any other reef, island, or atoll in the central Pacific (NOAA 2021).

The Monterey Bay National Marine Sanctuary occurs off the coast of California (**Figure 3.1.2-2**). The Sanctuary contains a diversity of habitats from kelp forests to underwater canyons which support a variety of marine life including 36 marine mammal species, more than 180 seabird and shorebird species, and at least 525 fish species (NOAA 2022c). Prohibited activities in the Sanctuary include exploring for, developing, or producing oil, gas, or minerals; drilling, dredging, or altering submerged lands; placing or abandoning structures; deserting vessels, disturbing, destroying, or taking sanctuary resources; and discharging harmful materials (NOAA 2022c).

The National Oceanic and Atmospheric Administration is in the process of designating a new national marine sanctuary in the ROI in and around Hudson Canyon in the Atlantic Ocean (NOAA 2023d, 87 FR 34853 [June 8, 2022]). Hudson Canyon is the largest submarine canyon along the U.S. Atlantic coast and reaches depths of 2.5 miles (NOAA 2023d). This canyon is a hotspot for biological diversity due to the diverse physical structure and areas of nutrient upwelling (NOAA 2023d). Hudson Canyon has been nominated as a national marine sanctuary to support conservation, research and management of marine wildlife, habitats, and maritime cultural resources (NOAA 2023d).

The National Oceanic and Atmospheric Administration has also begun the process for designating a Chumash Heritage National Marine Sanctuary in the Pacific Ocean off the California coast (NOAA 2023f). The proposed sanctuary would likely stretch along 134 miles of

coastline and encompass 5,617 square miles including areas historically important to the Chumash tribes and natural resources important to their heritage (NOAA 2023f). This area is rich in biodiversity and supports important habitats such as kelp forests, rocky reefs, and seamounts, banks, and canyons which are home to deep-sea corals and sponges (NOAA 2023f). A preferred alternative for the boundaries of the proposed sanctuary has not been selected but the sanctuary would likely overlap a very small portion of the Pacific BOA within the U.S. EEZ.

3.1.3 Hazardous Materials and Waste Management – BOA

3.1.3.1 Region of Influence

The ROI for hazardous material and wastes in the BOAs includes the areas within the Atlantic and Pacific study areas (**Figures 2.1.3-1** through **2.1.3-3**) where Proposed Action hazardous materials and wastes (as defined in **Appendix B, Section B.6**) would be generated, utilized, released, deposited, or transported. Based on the scope of proposed activities and potential location of hazardous materials and wastes, the ROI for hazardous materials and wastes includes two main areas:

- Ocean waters within the study areas and between 50 and 200 nm from land (within the EEZ) where vessel operations, vehicle launch, and stage 1 booster splashdown may occur; and
- Ocean waters within the study areas which are outside of EEZs in international waters where vessel operations, vehicle launch, component splashdown, and payload impact may occur.

As discussed in **Section 2.1.3**, all land-based launch preparations and operations including transportation, storage, and handling of hazardous materials and wastes to or at naval installations for loading onto launch platform vessels as well as routine vessel operations as part of military readiness activities have been previously analyzed within the various Navy Fleet and range complex EIS/OEISs listed in **Chapter 6.0**. As such, these land-based actions and vessel activity locations are not included here as part of the ROI.

3.1.3.2 Affected Environment

The affected environment for hazardous materials and wastes in the BOA ROI includes the broad open ocean and seafloor. Generally, the affected environment would be within deep ocean waters. While the variety of underwater topographic features within the Atlantic and Pacific BOAs, including seamounts and the deepest underwater canyons on earth, and the size of the BOA does not allow for detailed specifications of ocean depth and conditions in the ROI, several generalizations about the hazardous materials and waste affected environment can be made. In general, waters in the BOA ROI would be quite deep. The average depth of the Atlantic Ocean is 11,962 ft with a maximum depth of 27,493 ft (Britannica 2023) and the Pacific Ocean is the largest and deepest ocean basin on Earth, with an average depth of 13,000 ft (NOAA 2023e).

Substances and materials introduced into the ROI may be transported and influenced by ocean currents, salinity, temperature, pH ocean floor substrate, biological processes and ocean stratification and mixing (DON 2018a). Ocean currents, tides, and storms in the ROI mix and redistribute seawater and consequently redistribute and dilute substances that are dissolved and suspended in ocean waters (DON 2018a). Temperature and pH can influence the solubility of trace metals in seawater and the concentration of metals varies with the type of metal and the position in the water column (DON 2018a). Water and sediment characteristics and quality within much of the Atlantic BOA ROI are described in detail in the Atlantic Fleet Training and Testing EIS/OEIS (DON 2018a). Water and sediment characteristics and quality within much of the Pacific BOA ROI are described in detail in the Hawaii-Southern California Training and Testing EIS/OEIS (DON 2018b) and the Mariana Islands Training and Testing Supplemental EIS/OEIS (DON 2020a). While the study areas for these EISs do not overlap with the proposed Atlantic and Pacific BOAs completely, the affected environment described in these documents still represents the best available information for the affected environment, and the relevant sections of these documents are incorporated here by reference.

Pollution and marine debris are growing concerns for environmental quality in the world's oceans (Landrigan et al. 2020, NOAA 2023c). Common ocean pollutants include toxic compounds such as metals, pesticides, and other organic chemicals; excess nutrients from fertilizers and sewage; detergents; oil; plastics; and other solids. Pollutants enter oceans from non-point sources (i.e., storm water runoff from watersheds), point sources (i.e., wastewater treatment plant discharges), other land-based sources (i.e., windblown debris), spills, dumping, vessels, and atmospheric deposition.

One of the main global ocean pollution concerns, including the waters of the BOA ROI, is marine debris. Marine debris includes any persistent solid material that is intentionally or unintentionally disposed of or abandoned into the marine environment (NOAA 2023c). Common types of marine debris include various forms of plastic and abandoned fishing gear, as well as clothing, metal, glass, and abandoned and derelict vessels (NOAA 2023c). Marine debris degrades environmental quality for humans and marine life (Landrigan et al. 2020, NOAA 2023c). Marine debris is an increasing problem with an estimated 23 million metric tons of plastic waste entering aquatic ecosystems in 2016 (NOAA 2023c). Debris that sinks to the seafloor is a concern for ingestion and entanglement by marine life and may contribute to marine habitat degradation, contributing to deep water habitat damage (NOAA 2023c). Plastic marine debris is a major concern because it degrades slowly and many plastics float, allowing the debris to be transported by currents throughout the oceans. Ocean currents create gyres within the world's oceans which act to accumulate floating plastic marine debris, often called garbage patches (NOAA 2023c).

3.1.4 Health and Safety – BOA

3.1.4.1 Region of Influence

The ROI for health and safety includes the sea space and airspace in the Atlantic and Pacific study areas. The Atlantic study area covers an extensive, continuous swath of open water in the

North Atlantic Ocean, except for a large exclusion area surrounding the island of Bermuda (**Figure 2.1.3-1**), that is open to military, commercial, and recreational users. Health and safety in the Atlantic BOA ROI are described in detail in the Atlantic Fleet Training and Testing EIS/OEIS (DON 2018a). While the Atlantic Fleet Training and Testing study area does not completely overlap with the proposed Atlantic BOA, the affected environment described in this document still represents the best available information for human health and safety in the majority of the ROI. The Pacific study area covers the majority of the North Pacific Ocean between North America and Asia. Exceptions within the study area, shown on **Figures 2.1.3-2** and **2.1.3-3**, are areas around Marcus Island and the Hawaiian Islands. Although not shown on the figures, other populated islands within the study area boundary—including those in the Commonwealth of the Northern Mariana Islands, RMI, and Federated States of Micronesia—also are not considered part of the Pacific study area ROI, as there would be no Proposed Action-related health and safety risks placed on them or within any nation's territorial seas outside of USAKA (see **Section 3.2.8**). At-risk public includes those commercial and recreational users transecting the open ocean and airspace in the BOA study area. At-risk personnel include those on naval vessels that launch and track the missile tests, and that provide target support downrange.

3.1.4.2 Affected Environment

The Navy's Fleet Area Control and Surveillance Facilities provide support and training resources for DoD, Department of Homeland Security, and foreign military units by coordinating, scheduling, and monitoring activities in the U.S. Fleet OPAREAs and special use airspace. In naval ranges within the BOA (**Figures 2.1.3-1** through **2.1.3-3**), Range Control has published safety procedures for activities conducted both nearshore and offshore. Although operations in special use airspace are scheduled through the Navy Fleet and Area Control and Surveillance Facilities, Range Control coordinates the real-time control of operations in coordination with the FAA and other military users and communicates with the operations conductors and all participants entering and leaving the range areas. Current Navy practices employ the use of sensors and other devices (e.g., radar and electro-optical systems) to ensure public health and safety while conducting training and testing activities (DON 2018a).

The priority when planning and conducting missile tests is safety, both for military personnel and for the public. Military, commercial, and recreational activities take place simultaneously in the study area and have coexisted safely for decades because established rules and practices lead to safe use of the waterway and airspace. Standard operating procedures pertaining to health and safety are followed during any naval operation, regardless of whether it occurs in territorial or international waters.

Through the Naval Safety Command, the Navy promotes a proactive and comprehensive safety program designed to reduce to the greatest extent possible any potential adverse impacts on public health and safety from training and testing activities. The Navy schedules training and testing activities to minimize conflicts with the use of sea space and airspace within ranges and throughout the study area to ensure the safety of Navy personnel, the public, commercial aircraft, commercial and recreational vessels, and military assets. The Navy deconflicts its own

use of sea space and airspace to allow for the necessary separation of multiple Navy units to prevent interference with equipment sensors and avoid interaction with established commercial air traffic routes and commercial shipping lanes. These standard operating procedures benefit public health and safety (including persons participating in activities that have socioeconomic value, such as recreational or commercial fishing) through a reduction in the potential for interactions with training and testing activities.

Sea Space

While most of the Atlantic and Pacific study areas are accessible for recreational activities, the majority of recreational activities occur closer to the eastern and western coast of North America and most commercial activities occur along established routes. The intensity of use generally declines with increasing distance from the shoreline, although specific resources in the BOA may result in a concentration of use (e.g., sea mounts are preferred fishing locations). Some activities are prohibited or restricted within the naval OPAREAs closer to the shore and other designated danger zones or restricted areas. In accordance with 33 CFR § 165 (Regulated Navigation Areas and Limited Access Areas), these restrictions can be permanent or temporary. Nautical charts issued by the National Oceanic and Atmospheric Administration include these federally designated zones and areas. Operators of recreational and commercial vessels have a duty to abide by maritime regulations administered by the U.S. Coast Guard, which oversees maritime activities within U.S. (territorial) waters. The International Maritime Organization provides guidance for maritime activities in international waters.

Navy sea and air operations regularly occur in the Atlantic and Pacific BOA. Personnel on naval vessels abide by the rules and guidance provided in OPNAVINST 5100.19F, in addition to the general DoD and Navy Safety Program guidance and Occupational Safety and Health Administration regulations and training requirements. The Navy alerts the U.S. Coast Guard to any operations that would require closure or restriction of sea space to inform the public through NTMs. NTMs provide information about durations and locations of closures because of activities that are potentially hazardous to surface vessels. Broadcast notices on maritime frequency radio, weekly publications by the appropriate U.S. Coast Guard Navigation Center, and global positioning system navigation charts disseminate these navigational warnings.

Airspace

Navy operations occurring in airspace are planned and implemented according to OPNAVINST 3770.2L, Department of the Navy Airspace Procedures and Planning and subject to FAA regulations and guidance. Airspace operations in international airspace beyond FAA control are guided by the framework presented by the International Civil Aviation Organization's Global Aviation Safety Plan. Aside from the OPAREAs, which include restricted airspace, Military Operations Areas, and Warning Areas, airspace in the Atlantic study area is accessible to military, commercial, and recreational activities along designated flight routes. Some areas, like waterways, are temporarily off-limits to civilian and commercial use. The Navy implements advance NOTAMs through the FAA prior to conducting any tests that might be hazardous to non-participants. NOTAMs alert aircraft pilots of any hazards en route to or at a specific location, such as upcoming or ongoing military exercises with airspace restrictions. Civilian

aircraft are responsible for being aware of restricted airspace and any NOTAMs that are in effect. Pilots have a duty to abide by aviation rules as administered by the FAA.

3.2 Kwajalein Atoll, RMI

The Kwajalein Atoll portion of the study area includes KMISS, Illeginni Islet, and other locations within Kwajalein Atoll where proposed activities would take place. Both KMISS and Illeginni Islet are part of RTS and USAKA. KMISS is a deep-ocean range located just east of Gagan Islet with water depths ranging from approximately 7,000 to 12,000 ft. The KMISS range is routinely used for missile impact scoring as part of DoD test programs (e.g., U.S. Air Force 2020a, U.S. Air Force 2021, U.S. Army 2021, and DON 2019). Illeginni Islet is a small (31 acre) islet on the western side of Kwajalein Atoll. An approximate 7.6-acre area on the western end of the islet is routinely used for DoD testing as a land impact site.

This EA/OEA focuses on those environmental resources considered potentially subject to impacts from the Proposed Action. This section includes detailed descriptions of air quality, cultural resources, biological resources, geology and soils, water resources, hazardous materials and waste management, environmental justice, and health and safety at Kwajalein Atoll. These resource areas were carried forward for additional analysis of environmental consequences in **Chapter 4.0**.

3.2.1 Air Quality – Kwajalein Atoll

3.2.1.1 Region of Influence

The ROI includes all of Kwajalein Atoll and within 5 miles of the atoll land boundaries.

3.2.1.2 Affected Environment

Air quality at USAKA, including KMISS (southeast of Gagan Islet) and Illeginni Islet, is considered good overall due to the following: (1) dominant northeasterly trade winds for most of the year; (2) limited stationary air pollution sources for the entire atoll, mostly from U.S. Army operations on Kwajalein Island; (3) ocean cargo and military vessels and aircraft being dispersed over a very large area; (4) lack of topographic features to inhibit dispersion; and (5) aircraft operation typically above the mixing height. These features effectively widely disperse air emissions across the entire region.

The primary activities at USAKA contributing to air pollution are combustion sources that produce carbon monoxide, nitrous oxide, particulate matter and sulfur dioxide, and hydrocarbon emissions (USASMDC 2024). Most of these sources are located on Kwajalein Island and are regulated under the current version Air Emissions from Major, Synthetic Minor, and Industrial Boiler Stationary Sources Document of Environmental Protection 2019 (USAKA 2019). **Table 3.2.1-1** summarizes the most recent regulated air emissions for Illeginni and Gagan Islets based on the USAKA Air Emissions Inventory Report for 2000 (USAKA 2002).

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Table 3.2.1-1. Summary of Regulated Air Emissions for Illeginni and Gagan Islets

Island	Regulated Air Emissions (tons per year)					
	PM ₁₀	SO ₂	CO	NO ₂	VOC	Total HAPs
Illeginni Islet	0.54	0.51	1.66	7.72	0.62	0.01
Gagan Islet	0.98	0.92	3.01	13.96	1.11	0.01

Source: USAKA 2002

Acronyms and Abbreviations: CO = carbon monoxide, HAPs = Hazardous Air Pollutants, NO₂ = nitrogen dioxide, PM₁₀ = particulate matter less than or equal to 10 microns in diameter, SO₂ = sulfur dioxide, VOC = volatile organic compound

Consideration of Climate Change Impacts

Climate refers to average weather conditions within a certain range of variability. According to the Intergovernmental Panel on Climate Change primary concerns for small islands in the region are observed warming, increase in ocean acidification, continuing sea level rise associated with higher emissions, rise in storm surges and waves, shoreline retreat, and more intense tropical cyclones (IPCC 2021). The major climate-related natural hazards impacting the RMI are sea level rise, droughts, and typhoons (World Bank Group 2021).

Trends in the RMI are consistent with global patterns of warming and sea level rise. At Kwajalein, maximum temperatures increased at a rate of 0.36 degrees Fahrenheit per decade between 1960 and 2011 (PCCSP 2011) and mean air temperatures have increased 2 to 4 degrees Fahrenheit in the RMI since the 1950s (The Nature Conservancy n.d.). Ongoing global climate variability has contributed to rising sea levels and retreating shores, increased storm intensity, increased precipitation, disruption of natural ecosystems, and human health effects. Currently, USAKA and other islands and atolls in the RMI are being affected by rising sea levels from global climate change. Sea levels are expected to rise at least 0.2 inches per year with global mean sea level rise estimated in the range of 1.4 to 2.4 ft by 2100 (World Bank Group 2021). Sea level in the RMI rose approximately 0.3 inches per year between 1993 and 2011 (PCCSP 2011) with tide gauge data indicating a rise of approximately 5 to 6 inches between 1968 and 2015. For the Pacific Island region, an average sea level rise of between 9.8 and 22 inches is predicted by the middle of this century along the coastlines of Pacific Island countries, which would be devastating for islands that sit at or just above sea level (National Science Foundation 2022). Another consequence of increasing global CO₂ levels that has the potential to impact the environment at Kwajalein Atoll is ocean acidification. Ocean acidification has been slowly increasing in Marshall Islands' waters since the 18th century (PCCSP 2011). Ocean acidification and ocean temperatures are expected to continue to rise in the next several decades (Australian Bureau of Meteorology 2014).

3.2.2 Cultural Resources – Kwajalein Atoll

3.2.2.1 Region of Influence

The CPS flight test target site at Illeginni Islet is an approximate 7.6-acre area on the west end of the islet that includes the helipad. The ROI for Illeginni Islet at USAKA includes the proposed

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impact site and adjacent areas on the west half of the island. Due to the development on the rest of the island, temporary siting of equipment and visits to establish equipment during testing do not have the potential to affect cultural resources and are excluded from the ROI and area of potential effects.

3.2.2.2 Affected Environment

KMISS is a deep-water range with no known cultural resources.

Illeginni Islet was developed in the 1970s and includes a helipad, roads, harbor, and facilities with moderate vegetative cover that represents regrowth since the 1970s development period (DON 2019). The site has been used for weapons testing since the 1990s. An archaeological survey and subsurface testing in 1994 identified charcoal associated with a midden along the lagoon shoreline that is most likely a modern intrusion and not recommended eligible for listing in the RMI National Register of Historic Places (NRHP). Archaeological surveys conducted in 1998 did not identify any archaeological sites on Illeginni Islet. Accordingly, no indigenous cultural materials or evidence of buried archaeological deposits has been found on Illeginni Islet.

A 1996 survey of Cold War-era properties at USAKA was followed by a 2012 Cold War Historic Context Study. Several buildings and structures at USAKA are eligible for listing in the RMI NRHP for associations with Cold War Missile Defense historic themes. Seven buildings on Illeginni Islet are potentially eligible for RMI NRHP listing for associations with Cold War Missile Defense historic themes. Three of those are considered to be significant. All are located on the central and eastern portions of the island and are no longer used and abandoned in place (DON 2019).

3.2.3 Biological Resources – Kwajalein Atoll

3.2.3.1 Region of Influence

The ROI for biological resources at USAKA includes the areas subject to effects of the Proposed Action including:

- The proposed deep ocean water impact site at KMISS (**Figure 2.1.4-2**);
- The proposed payload impact site on Illeginni Islet (**Figure 2.1.4-3, Figure 3.2.3-1**);
- Test support facilities and vessel operation locations at USAKA to be used for the Proposed Action; and
- Terrestrial and marine areas in the vicinity of these sites that may be subject to effects of the Proposed Action including elevated noise levels.

Biological resources in both the deep offshore waters and the Illeginni Islet portions of the ROI are substantially the same as those described in the Ground Based Strategic Deterrent (GBSD) EA/OEA (U.S. Air Force 2021). The status of biological resources in the ROI as described in the GBSD EA/OEA (U.S. Air Force 2021) remains the best available information for the ROI

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affected environment and is incorporated here by reference. The following sections provide a brief summary of biological resources in the ROI, focusing on important habitats and special status species, including species considered coordination or consultation species under the UES. Detailed species descriptions and occurrence information can be found in the GBSD EA/OEA (U.S. Air Force 2021), Flight Test-3 EA/OEA (U.S. Army 2021), and in the Navy CPS Biological Assessment for Activities at Kwajalein Atoll (DON and USASMDC 2023) and are incorporated by reference.

3.2.3.2 Affected Environment Deep Offshore Waters

The waters of the ROI in the KMISS area are deep-water areas with a wide variety of pelagic and benthic habitats that support a diversity of marine life. Many special status marine species have the potential to occur in the ROI, including cetacean, sea turtle, and fish species protected under the UES (**Table 3.2.3-1**; USASMDC 2024, U.S. Army 2021). Distribution and abundance data in RMI waters are largely lacking for these species. Some species are migratory species which are present in RMI waters seasonally and some others are observed only rarely in the RMI.

Marine Wildlife

Invertebrates. Habitats in deep offshore areas of the ROI may support a variety of pelagic and deep-water benthic invertebrates. Little information is known about species assemblages in the deep offshore waters of Kwajalein Atoll; however, deep water benthic communities have been documented around other islands in the central Pacific including the Hawaiian Archipelago, Wake Island, and Johnston Atoll (Parrish and Baco 2007, Kelley et al. 2017, Kelley et al. 2018). A diversity of corals, sponges, and other invertebrates have been found in habitats at depths of 3,300 – 8,200 ft near these islands (U.S. Air Force 2021, Kelley et al. 2017, Parrish and Baco 2007, Kelley et al. 2018). The presence and potential composition of deep-water benthic communities in the ROI are unknown; however, if coral species occurred in the deep-water impact site within RMI waters, those species would likely be UES coordination species (listed in Appendix 3-4C of USASMDC 2024).

Gametes and larvae of many special status nearshore, reef-associated invertebrate species also have the potential to occur in the ROI seasonally during and within weeks after spawning (U.S. Air Force 2021). Many nearshore, reef-associated special status coral, mollusk, and fish species are likely to occur near Gagan Islet and throughout Kwajalein Atoll (U.S. Air Force 2021). Any eggs, larvae, or juveniles of these special status species that do occur in deep waters are likely to occur at very low densities and with patchy distributions (U.S. Air Force 2021). The Proposed Action would have minimal to no effects on gametes or larvae of special status species and they are not discussed further in this EA/OEA.

Table 3.2.3-1. UES Consultation (red) and Coordination Fishes, Sea Turtles, and Marine Mammals with the Potential to Occur in the Kwajalein Atoll ROI near Illeginni Islet and in Deeper Offshore Waters

Common Name	Scientific Name	UES Listing Status ¹	Likelihood of Occurrence	
			Nearshore Waters	Deeper Offshore Waters
Fishes				
Bigeye thresher shark	<i>Alopias superciliosus</i>	§ 3-4.5.1(a)	-	Potential
Bumphead parrotfish	<i>Bolbometopon muricatum</i>	§ 3-4.5.1(a)	Potential	-
Oceanic whitetip shark	<i>Carcharhinus longimanus</i>	T	-	Potential
Humphead wrasse	<i>Cheilinus undulatus</i>	§ 3-4.5.1(a)	Likely	-
Shortfin mako shark	<i>Isurus oxyrinchus</i>	§ 3-4.5.1(a)	-	Potential
Reef manta ray	<i>Mobula (Manta) alfredi</i>	§ 3-4.5.1(a)	Likely	Potential
Oceanic giant manta ray	<i>Mobula (Manta) birostris</i>	T	-	Likely
Giant coral trout	<i>Plectropomus laevis</i>	§ 3-4.6.1(a)	Likely	-
Scalloped hammerhead shark	<i>Sphyrna lewini</i>	T	-	Potential
Pacific bluefin tuna	<i>Thunnus orientalis</i>	§ 3-4.5.1(a)	-	Potential
Sea Turtles				
Loggerhead turtle	<i>Caretta caretta</i>	E, Statute 3	-	Potential
Green turtle	<i>Chelonia mydas</i>	T, Statute 3	Likely	Likely
Leatherback turtle	<i>Dermochelys coriacea</i>	E, Statute 1	-	Potential
Hawksbill turtle	<i>Enetmochelys imbricata</i>	E, Statutes 1 and 3	Potential	Likely
Olive ridley turtle	<i>Lepidochelys olivacea</i>	T, Statute 3	-	Potential
Marine Mammals				
Minke whale ²	<i>Balaenoptera acutorostrata</i>	MMPA ²	-	Likely
Sei whale ²	<i>Balaenoptera borealis</i>	E ² , MMPA	-	Potential
Blue whale	<i>Balaenoptera musculus</i>	E, MMPA, Statute 1	-	Likely
Fin whale	<i>Balaenoptera physalus</i>	E, MMPA	-	Likely
Short-beaked common dolphin	<i>Delphinus delphis</i>	MMPA, Statute 2	-	Likely
Pygmy killer whale	<i>Feresa attenuata</i>	MMPA	-	Potential
Short-finned pilot whale	<i>Globicephala macrorhynchus</i>	MMPA	-	Likely
Risso’s dolphin	<i>Grampus griseus</i>	MMPA	-	Potential
Pygmy sperm whale	<i>Kogia breviceps</i>	MMPA	-	Potential
Humpback whale	<i>Megaptera novaeangliae</i>	E ³ , MMPA	-	Likely
Blainville’s beaked whale	<i>Mesoplodon densirostris</i>	MMPA	-	Potential
Killer whale	<i>Orcinus orca</i>	MMPA	-	Likely
Melon-headed whale	<i>Peponocephala electra</i>	MMPA	-	Likely
Sperm whale	<i>Physeter macrocephalus</i>	E, MMPA, Statute 1	-	Likely
False killer whale	<i>Pseudorca crassidens</i>	MMPA	-	Potential

Common Name	Scientific Name	UES Listing Status ¹	Likelihood of Occurrence	
			Nearshore Waters	Deeper Offshore Waters
Marine Mammals (Continued)				
Pantropical spotted dolphin	<i>Stenella attenuata</i>	MMPA, Statute 2	-	Likely
Striped dolphin	<i>Stenella coeruleoalba</i>	MMPA, Statute 2	-	Likely
Spinner dolphin	<i>Stenella longirostris</i>	MMPA, Statute 2	-	Likely
Bottlenose dolphin	<i>Tursiops truncatus</i>	MMPA	-	Likely

Data Sources: U.S. Army 2021, U.S. Air Force 2021, NOAA 2023b, USASMDC 2024, NMFS and USFWS 2018

Acronyms and Abbreviations: DPS = Distinct Population Segment, E = Endangered Species Act endangered, T = Endangered Species Act threatened, MMPA = Marine Mammal Protection Act, UES = United States Army Kwajalein Atoll Environmental Standards

RMI Statutes: 1 = Endangered Species Act 1975, Title 8 MIRC [Mariana Islands Range Complex] Chapter 3; 2 = Marine Mammal Protection Act 1990, Title 33 MIRC Chapter 2; 3 = Fisheries Act 1997, Title 51 MIRC Chapter 2

¹ UES Listing Status based on Appendix 3-4A of the UES (USASMDC 2024). All species in this table are considered consultation species under the UES.

² The minke whale and sei whale are not specifically listed in Section 3-4 of the UES but are protected under the MMPA and the sei whale is listed under the ESA. These species are therefore included as special status species.

³ The humpback whale DPS likely in the ROI, the Oceania DPS (NOAA 2023b), is not listed under the ESA and is not a depleted stock under the MMPA. However, the UES specifies the Western North Pacific DPS which is listed as endangered under the ESA.

Fishes. UES consultation fish species have the potential to occur in the deep ROI waters (**Table 3.2.3-1**). The bigeye thresher shark (*Alopias superciliosus*), oceanic whitetip shark, shortfin mako shark (*Isurus oxyrinchus*), oceanic giant manta ray, and Pacific bluefin tuna (*Thunnus orientalis*) are more oceanic, deep-water species and are the most likely to occur in the deep waters of the ROI (U.S. Air Force 2020b). Scalloped hammerhead and reef manta rays (*Mobula alfredi*, listed as *Manta alfredi* under UES Appendix 3-4A) generally have more coastal distributions. While scalloped hammerheads and reef manta rays are less likely to occur in the deep waters of the ROI, individuals have been known to migrate further offshore (Marshall et al. 2022, FAO 2006) and these species have the potential to occur in the ROI.

Marine Reptiles. Both green and hawksbill sea turtles are likely to occur in the ROI (**Table 3.2.3-1**; Maison et al. 2010). While there is little documented evidence that three other species of sea turtles (loggerhead, leatherback, and olive ridley) occur in waters of the RMI, these species are highly migratory, are known to occur in pelagic habitats throughout the Pacific (NOAA 2023b), and have the potential to occur in deep waters of the ROI. The primary threats to sea turtles in the ROI include bycatch in commercial fisheries, ship strikes, and marine debris (Lutcavage et al. 1997). Marine debris can be a problem for sea turtles through entanglement or ingestion. In addition to the threats all sea turtle species face throughout their ranges, sea turtles near Kwajalein Atoll have the potential to be affected by local harvest. In the RMI, sea turtles are an important part of Marshallese culture; they are featured in many myths, legends, and traditions, where they are revered as sacred animals (Kabua and Edwards 2010). Eating turtle meat and eggs on special occasions remains a prominent part of the culture (Kabua and

Edwards 2010). The harvest of sea turtles in the RMI is regulated by the RMI Marine Resources Act (Kabua and Edwards 2010).

Birds. The open ocean areas of the ROI provide habitat for a number of foraging and resting seabirds, many of which are protected under the UES. Several species of boobies, frigatebirds, gulls, terns, noddies, shearwaters, petrels, and tropicbirds are coordination species under the UES (Appendix 3-4C of USASMDC 2024). No terrestrial nesting habitat for birds occurs within the deep-water ROI; however, many species of seabirds likely use portions of the ROI for feeding and resting.

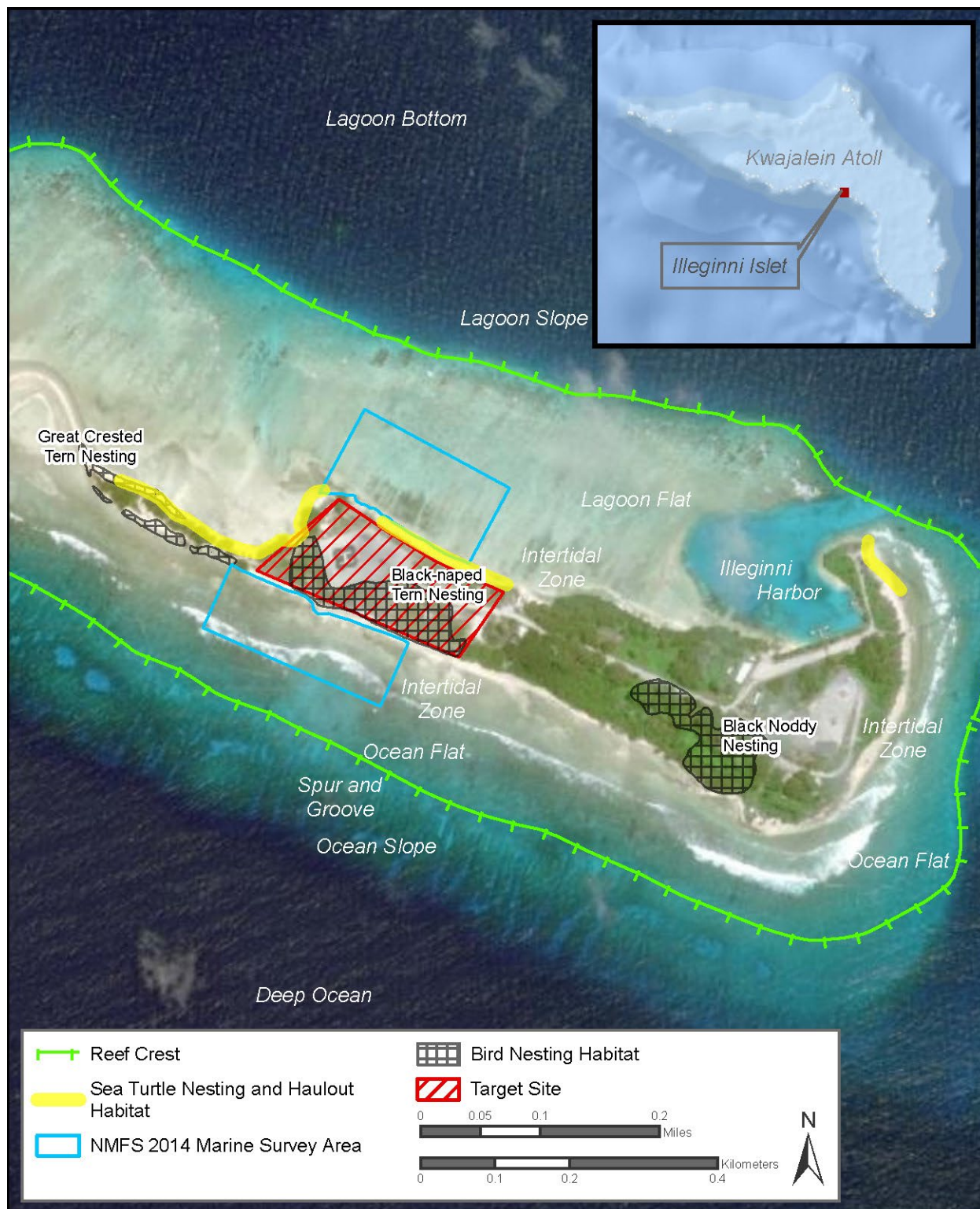
Marine Mammals. UES-protected cetaceans most likely to occur in the ROI include blue whales (*Balaenoptera musculus*), sperm whales (*Physeter macrocephalus*), short-beaked common dolphins (*Delphinus delphis*), short-finned pilot whales (*Globicephala macrorhynchus*), killer whales (*Orcinus orca*), melon-headed whales (*Peponocephala electra*), pantropical spotted dolphins (*Stenella attenuata*), striped dolphins (*Stenella coeruleoalba*), spinner dolphins, and bottlenose dolphins (*Tursiops truncatus*; U.S. Air Force 2021, Miller 2007). Minke whales are also likely to occur in the deep waters of the RMI (Miller 2007). Potential threats to cetacean species in the ROI include ingestion of marine debris, entanglement in fishing nets or other marine debris, collision with vessels, loss of prey species due to new seasonal shifts in prey species or overfishing, excessive noise above baseline levels in a given area, chemical and physical pollution of the marine environment, parasites and diseases, and changing sea surface temperatures due to global climate change (NOAA 2023b).

3.2.3.3 Affected Environment Illeginni Islet

As required under Section 3-4.9.2 of the UES, USAG-KA, with the assistance of the NMFS and USFWS, conducts biological baseline surveys every 2 years to identify and inventory special status or significant wildlife and habitats throughout USAKA. These inventories have included surveys of terrestrial, reef, and harbor habitats throughout USAKA and the mid atoll corridor, and provide the best available baseline data for habitats at Illeginni Islet.

Terrestrial Vegetation

Vegetation on Illeginni Islet is previously disturbed and managed on much of the western end of the islet, including the payload impact zone (U.S. Air Force 2021). The only native vegetation present on the islet consists of a patch of herbaceous vegetation and three patches of littoral (nearshore) forest (U.S. Air Force 2021; **Figure 3.2.3-1**). No special status vegetation species occur on Illeginni Islet.



Data Source: Illeginni Islet habitat data from USASMDC 2024; Esri World Imagery Basemap

Figure 3.2.3-1. Terrestrial Habitat and Marine Survey Areas at Illeginni Islet

Terrestrial Wildlife

Important or special-status terrestrial wildlife on Illeginni Islet include hauled-out or nesting sea turtles and several seabird species.

Birds. At least 14 species of protected migratory and resident seabirds and shorebirds have been seen breeding, roosting, or foraging on Illeginni Islet (**Table 3.2.3-2**) during biological inventories conducted by the USFWS and NMFS (NMFS and USFWS 2012). A number of shorebirds use the littoral forest, littoral shrub, and managed vegetation throughout the islet's interior, including white terns (*Gygis alba*) and black noddies (*Anous minutus*; **Figure 3.2.3-1**; NMFS and USFWS 2012). Other species such as the great crested tern (*Thalasseus bergii*) and black-naped tern (*Sterna sumatrana*) roost on the shoreline embankment and exposed inner reef (NMFS and USFWS 2012). Black-naped terns are known to nest in and near the proposed payload impact site (U.S. Air Force 2021, Fry 2017). All of these migratory and resident birds are protected under the Migratory Bird Treaty Act and are UES-coordination species. There are no known UES-consultation bird species on Illeginni Islet.

Table 3.2.3-2. UES Coordination Birds that Occur on Illeginni Islet

Common Name	Scientific Name	Common Name	Scientific Name
Brown noddy	<i>Anous stolidus</i>	Whimbrel	<i>Numenius phaeopus</i>
Black noddy	<i>Anous minutus</i>	Bristle-thighed curlew	<i>Numenius tahitiensis</i>
Ruddy turnstone	<i>Arenaria interpres</i>	Pacific golden plover	<i>Pluvialis fulva</i>
Pacific reef heron	<i>Egretta sacra</i>	Black-naped tern	<i>Sterna sumatrana</i>
Great frigatebird	<i>Fregata minor</i>	Great crested tern	<i>Thalasseus bergii</i>
White tern	<i>Gygis alba</i>	Gray-tailed tattler	<i>Tringa brevipes</i>
Godwit sp.	<i>Limosa</i> sp.	Wandering tattler	<i>Tringa incana</i>

Data Source: NMFS and USFWS 2012

Reptiles. Suitable sea turtle haulout and nesting habitat exists on the northwestern and eastern beaches of Illeginni Islet (U.S. Air Force 2021; **Figure 3.2.3-1**). However, no sea turtle nests or nesting activity has been observed on Illeginni Islet in over 25 years (U.S. Air Force 2021, USFWS 2021b). Green and hawksbill turtles are known to use the nearshore waters of Illeginni Islet, but it is unlikely that sea turtles will haul out or nest on Illeginni Islet (U.S. Air Force 2021).

Marine Vegetation

Marine habitats around Illeginni Islet include both lagoon-side and ocean-side reef flats, crests, and slopes that provide habitat for a number of macroalgae species (U.S. Air Force 2021, NMFS and USFWS 2017). The only special status algae species known to occur in the ROI is seagrass (*Halophila gaudichaudii*) which is listed as a coordination species under the UES (U.S. Air Force 2021). Seagrass forms dense beds which are sometimes found in Illeginni Harbor, as well as down the slopes in and near the harbor entrance (NMFS and USFWS 2017).

Marine Wildlife

The marine environment surrounding Illeginni Islet supports a diverse community of fishes, corals, and other invertebrates. In general, coral cover and invertebrate diversity is moderate to high on the lagoon-side reef crests and slopes and relatively high on ocean-side reef flats and ridges (U.S. Army 2021).

Invertebrates. A diverse invertebrate community exists in the shallow waters near Illeginni Islet that is typical of reef ecosystems in the tropical insular Pacific (U.S. Air Force 2021). Typical benthic invertebrates include sea anemones, sponges, corals, starfish, sea urchins, worms, bivalves, and crabs (U.S. Air Force 2021). Within the benthic invertebrate community are many coral and mollusk species that are protected as consultation or coordination species under the UES (U.S. Air Force 2021, USASMDC 2024). In 2014, NMFS surveyed the reef areas adjacent to the terrestrial impact site at Illeginni Islet (**Figure 3.2.3-1**; NMFS-PIRO 2017a, NMFS-PIRO 2017b, U.S. Air Force 2021). These surveys still represent the best available data on the invertebrate assemblages in these nearshore areas and are described in the GBSD Test EA/OEA (U.S. Air Force 2021).

Overall, NMFS recorded 37 UES coordination coral species and six UES consultation corals in these nearshore marine survey areas (**Table 3.2.3-3**; NMFS-PIRO 2017a, NMFS-PIRO 2017b). Other coral species exist in the reefs surrounding other USAKA islets, in other reefs around Illeginni Islet, and in Illeginni Harbor as described in the Navy CPS Biological Assessment for Activities at Kwajalein Atoll (DON and USASMDC 2023). However, these are the only species likely to occur offshore of the payload impact site at Illeginni Islet as adults (U.S. Air Force 2021). All of these species are relatively widespread in Kwajalein Atoll, with known occurrence in reefs at the majority of surveyed USAKA islets (**Table 3.2.3-3**).

During 2014 surveys, NMFS recorded four UES consultation mollusk species and two UES coordination mollusk species (**Table 3.2.3-3**) offshore of the proposed payload impact site (NMFS-PIRO 2017a, NMFS-PIRO 2017b). These species are the only species likely to be in the ROI; however, two other consultation species (*Tridacna gigas* and *Pinctada margaritifera*) have been recorded elsewhere at Illeginni Islet reefs and potentially occur in the ROI (U.S. Air Force 2021). All of these special status mollusk species are relatively widespread in Kwajalein Atoll, with known occurrence in reefs at the majority of surveyed USAKA islets (**Table 3.2.3-3**).

Sponges are ubiquitous on the seafloor in the ROI at all depths but are most common on hard bottom or reef substrates (U.S. Air Force 2021). The sponges that inhabit coral reefs of the RMI are generally found throughout the tropical Indo-Pacific region. All artificially planted or cultivated sponges (phylum Porifera) within the RMI are afforded protection under the RMI Marine Resources Act and are protected under the UES (USASMDC 2024, U.S. Air Force 2021). However, no cultivated sponges are known to occur in the shallow waters near Illeginni Islet (U.S. Air Force 2021).

Table 3.2.3-3. UES Consultation (red) and Coordination Invertebrate Species in Illeginni Islet Nearshore Habitats

Group Family Name Scientific Name	Common Name	Occurrence in		Number of USAKA Islets Observed on (n=11)
		Ocean-Side Survey Area	Lagoon-Side Survey Area	
Corals				
Milleporidae				
<i>Millepora</i> sp.		x	x	11
Helioporidae				
<i>Heliopora coerulea</i>	Blue coral	-	x	11
Acroporiidae				
<i>Acropora abrotanoides</i>		x	-	11
<i>Acropora aculeus</i>	Bottlebrush <i>Acropora</i>	-	-	6
<i>Acropora aspera</i>	Green staghorn coral	-	-	9
<i>Acropora austera</i>	Stony coral	x	-	11
<i>Acropora dendrum</i>		-	-	9
<i>Acropora digitifera</i>		x	x	11
<i>Acropora gemmifera</i>		x	-	11
<i>Acropora humilis</i>	Finger coral	x	-	11
<i>Acropora latistella</i>		x	-	11
<i>Acropora listeri</i>		-	-	6
<i>Acropora microclados</i>	Strawberry shortcake <i>Acropora</i>	x	-	11
<i>Acropora monticulosa</i>		x	-	11
<i>Acropora nana</i>	Purple nana	x	-	10
<i>Acropora nasuta</i>	Branching staghorn coral	x	-	11
<i>Acropora polystoma</i>		x	-	6
<i>Acropora robusta</i>	Green robusta	x	x	10
<i>Acropora secale</i>	Purple tipped <i>Acropora</i>	x	-	11
<i>Acropora speciosa</i>		-	-	3
<i>Acropora tenella</i>		-	-	5
<i>Acropora tenuis</i>		x	x	11
<i>Acropora vaughani</i>		-	-	9
<i>Alveopora verrilliana</i>		-	-	4
<i>Astreopora myriophthalma</i>	Porous star coral	-	x	11
<i>Montipora aequituberculata</i>	Encrusting pore coral	x	-	11
<i>Montipora caliculata</i>		-	-	11
<i>Montipora digitata</i>		-	x	9
Agariciidae				
<i>Gardineroseris planulata</i>	Honeycomb coral	x	x	10
<i>Leptoseris incrustans</i>	Swelling coral	-	-	10
<i>Pavona cactus</i>		-	-	8
<i>Pavona decussata</i>	Leaf or cactus coral	-	-	5

Group Family Name Scientific Name	Common Name	Occurrence in		Number of USAKA Islets Observed on (n=11)
		Ocean-Side Survey Area	Lagoon-Side Survey Area	
<i>Pavona duerdeni</i>	Flat lobe coral	x	-	11
<i>Pavona varians</i>	Corrugated coral	x	-	11
<i>Pavona venosa</i>		-	x	11
Dendrophylliidae				
<i>Turbinaria mesenterina</i>	Vase coral	-	-	4
<i>Turbinaria reniformis</i>	Yellow scroll coral	-	x	11
<i>Turbinaria stellulata</i>	Disc coral	-	-	6
Faviidae				
<i>Dipsaetrea (Favia) matthaii</i>	Knob coral	x	-	11
Fungiidae				
<i>Lobactis (Fungia) scutaria</i>	Common razor coral	x	x	11
Lepastreidae				
<i>Leptastrea purpurea</i>	Crust coral	x	x	11
Lobophylliidae				
<i>Acanthastrea brevis</i>	Starry cup coral	-	-	9
<i>Lobophyllia (Symphyllia) recta</i>	Brain coral	x	-	10
Meruliniidae				
<i>Cyphastrea agassizi</i>	Agassiz's coral	-	x	9
<i>Favites abdita</i>		-	x	10
<i>Favites pentagona</i>	Larger star coral	-	x	9
<i>Goniastrea edwardsi</i>		x	-	11
<i>Goniastrea reniformis</i>		x	-	10
<i>Hydnophora microconis</i>		x	-	11
<i>Platygyra sinesis</i>	Lesser valley coral	x	x	11
Pocilloporiidae				
<i>Pocillopora damicornis</i>	Cauliflower or lace coral	-	x	11
<i>Pocillopora eydouxi</i>	Antler coral	x	x	11
<i>Pocillopora meandrina</i>	Cauliflower coral	x	-	11
<i>Pocillopora verrucosa</i>	Cauliflower coral	x	-	11
Poritiidae				
<i>Porites lobata</i>	Lobe coral	x	x	11
<i>Porites lutea</i>	Hump coral	x	x	11
<i>Porites rus</i>	Mountain cupcoral	x	-	11
Mollusks				
Trochiidae				
<i>Rochia nilotica (Trochus niloticus)</i>	Top shell snail	-	x	11
Cardiidae				
<i>Hippopus hippopus</i>	Giant clam	x	x	11
<i>Tridacna gigas</i>	Giant clam	-	-	11

Group Family Name Scientific Name	Common Name	Occurrence in		Number of USAKA Islets Observed on (n=11)
		Ocean-Side Survey Area	Lagoon-Side Survey Area	
<i>Tridacna maxima</i>	Giant clam	-	x	11
<i>Tridacna squamosa</i>	Giant clam	-	x	9
Margaritidae				
<i>Pinctada margaritifera</i>	Black-lip pearl oyster	-	-	8
Strombidae				
<i>Lambis lambis</i>	Spider conch	-	x	11
<i>Lambis</i> c.f. <i>truncata</i>	Giant spider conch	x	-	11

Data Sources: NMFS-PIRO 2017a, NMFS-PIRO 2017b, NMFS and USFWS 2017, WoRMS Editorial Board 2024
Abbreviations: “-” = not observed, “x” = observed during survey

In addition to the adults of these species, larvae and gametes of many of these marine invertebrates may be found in the ROI during and in the weeks following spawning. Concentrations of these larvae and gametes would be episodic and seasonal in the ROI and averaged over the timespan of a year, densities would be very low (U.S. Air Force 2021). Additional information about coral and mollusk reproduction, as well as threats to these species, is detailed in the GBSD Test EA/OEA (U.S. Air Force 2021) and the GBSD Kwajalein Atoll Biological Assessment (U.S. Air Force 2020b) included here by reference.

Fishes. A diversity and abundance of reef-associated fishes are found in the shallow waters near Illeginni Islet (U.S. Air Force 2021) and have been recorded during biological inventories of USAKA islets (**Table 3.2.3-1**). During the 2014 NMFS surveys of the nearshore areas adjacent to the proposed payload impact site (**Figure 3.2.3-1**), 45 fish species were recorded in the ocean-side survey area and 40 species in the lagoon-side survey area (NMFS-PIRO 2017a). The most abundant fish included *Atherinid* sp., *Chrysiptera brownriggii*, *Stethojoulis bandanensis*, *Halichoeres trimaculatus*, *Halichoeres margaritaceus*, and *Thalassoma quinquevittatum* (NMFS-PIRO 2017a). No UES consultation species were observed during these surveys. However, reef fish can be highly mobile species and the humphead wrasse (*Cheilinus undulatus*) and a *Mobula* (*Manta*) species have been observed on biological inventories at Illeginni Islet and may occur in nearshore waters (U.S. Air Force 2021). One UES coordination species, the giant coral trout (*Plectropomus laevis*) was observed in the ocean-side survey area in 2014 and has been recorded in other reef inventories near Illeginni Islet (U.S. Air Force 2021). Additional information about the occurrence and abundance of the humphead wrasse and manta ray species near Illeginni Islet can be found in the GBSD EA/OEA (U.S. Air Force 2021) and the GBSD Kwajalein Atoll Biological Assessment (U.S. Air Force 2020b) included here by reference.

Reptiles. Green and hawksbill turtles are the only sea turtles known to occur in the nearshore waters of the RMI (U.S. Air Force 2021). Green turtles are more common, while hawksbills are considered rare (U.S. Air Force 2021, Maison et al. 2010). Sea turtles have been observed fairly regularly in marine environments during biological inventories at Illeginni Islet (U.S. Air Force 2021). Dense seagrass beds, which are sometimes found in and near Illeginni Harbor, may

provide valuable foraging habitat for green turtles (U.S. Air Force 2020b). Both of these species are likely to occur in both nearshore waters of Illeginni and in deeper offshore waters. Additional information about sea turtle occurrence data and the threats to sea turtles in the ROI can be found in the GBSD EA/OEA (U.S. Air Force 2021) and the CPS Biological Assessment (DON and USASMDC 2023) included here by reference.

Environmentally Sensitive Habitats

Habitats listed in Appendix 3-4D of the UES (USASMDC 2024) are habitats listed under Section 3-4.6.1 of the UES that may trigger coordination procedures. UES coordination terrestrial habitats on and near Illeginni Islet includes terrestrial habitats used for white tern nesting, black-naped tern nesting, and sea turtle haulout (**Figure 3.2.3-1**; USASMDC 2024). These terrestrial habitats may include mixed littoral forest, mixed littoral shrub, managed vegetation, and sand/rock beach (USASMDC 2024). Black-naped terns nest in managed vegetation in and near the proposed payload impact site on Illeginni Islet (**Figure 3.2.3-1**). Potential sea turtle haulout habitat is sand and rock beaches.

Marine coordination habitats under the UES (Appendix 3-4D of USASMDC 2024) include any marine habitats used by UES consultation and coordination species, for coastal fisheries, for reef development, and for coastal buffering (USASMDC 2024). These marine habitats may include the intertidal zone, reef flats, reef crests, reef slopes, patch reefs, spurs and grooves, seagrass meadows, and consolidated bottom. Intertidal zone, lagoon flat, and ocean flat habitat occur within the ROI offshore of the proposed payload impact zone (**Figure 3.2.3-1**).

3.2.4 Geology and Soils – Kwajalein Atoll

3.2.4.1 Region of Influence

The ROI for geology and soil resources includes the areas subject to effects of the Proposed Actions including:

- KMISS deep-ocean range off Gagan Islet at RTS (**Figure 2.1.4-2**)
- Proposed impact site on the western side of Illeginni Islet (**Figure 2.1.4-3**)

3.2.4.2 Affected Environment Deep Offshore Waters

KMISS is a deep ocean sensor array located approximately 3.2 to 8.6 nm east of Gagan Islet. Within the ROI at KMISS, ocean depths ranging from 7,000 to 12,000 ft. Wave energy and grain size tend to correlate from less-energetic waves with smaller grain sizes further out to sea, to more-energetic with larger grain sizes in the emergent reef slope due to the kinetic energy of the wave action on the reef profile; additionally, larger grains are unable to be suspended in the water column as far as smaller grain sizes can (Bramante et al. 2020). Therefore, from USAKA shores to Pacific BOA the grain size transitions trend towards pebble/cobble, medium/coarse pebble, sand/pebble, medium/coarse sand, and silt/sand.

3.2.4.3 Affected Environment Illeginni Islet

Illeginni Islet runs roughly west-northwest to east-southeast; it is approximately 2,790 ft long and averages about 574 ft across. The northwestern end is a narrow finger that extends into several sandbars, while the southeastern end has a hook-shaped harbor on the north side. The lagoon side of the island consists of unconsolidated sediments that are thicker and contain a greater proportion of low-permeability back-reef sand than the ocean side. Drilling logs suggest a greater proportion of coarse, high-permeability rubble on the ocean side than the lagoon side of the islets. (RGNext 2020)

Because of previous reentry vehicle tests on Illeginni Islet, residual concentrations of beryllium and depleted uranium remain in the soil near the helipad on the west side of the islet. In 2005, soil samples collected around the helipad were analyzed to determine concentrations of beryllium and depleted uranium in the soil following a missile flight test. Soil samples were collected again following subsequent flight tests and results were reported in 2010 and 2013 (Robison et al. 2013). The observed soil concentrations of beryllium and uranium (as a surrogate for depleted uranium) in Illeginni Islet soil samples were within compliance with U.S. Environmental Protection Agency (USEPA) Region 9 Preliminary Remediation Goals as outlined in the UES (**Table 3.2.4-1**; USASMDC 2024, USEPA 2022b).

The most recent soil samples collected at Illeginni Islet were between 2018 (pre-test) and 2020 (post-test) for a flight test event. Results from the soil sampling conducted in September 2018 indicated possible beryllium and uranium above the screening levels. Beryllium was not detected in any of the 20 parent soil samples collected from the Illeginni Islet borings; however, it was detected in one of the duplicate samples with a concentration of 1.9 milligrams per kilogram (mg/kg), which exceeded the 1.1 mg/kg 2018 screening level for beryllium (DON 2019). This sample was a field duplicate of a sample in which beryllium was not detected above 0.089 mg/kg (DON 2019). This large discrepancy may be due to the heterogeneous nature of the soil matrix (described as gravelly sand; U.S. Air Force 2021). Residual concentrations of tungsten remaining in the soil following previous flight tests from other programs were below the USEPA Regional Screening Level for residential and commercial areas (**Table 3.2.4-1**; DON 2019). Uranium was detected in 26% of pre-test soil samples and 29% of post-test samples but concentrations were well below the primary UES compliance goal. Although the UES goal is used here for analysis purposes, it should be noted that the sample results for uranium were above the secondary USEPA resident soil to groundwater Regional Screening Level (**Table 3.2.4-1**; RGNext 2020, USEPA 2022d). As required under Section 3-6.5.8 of the UES soil sampling plans are currently being developed by USASMDC to ensure sampling consistency for Illeginni Islet soil sampling events.

Table 3.2.4-1. Regulatory Limits and Historical Soil Testing Results from Illeginni Islet

Category or Study	Beryllium (Be)		Tungsten (W)		Depleted Uranium (DU)	
Regulatory Compliance Goals and Screening Levels						
UES Compliance Goals ¹	160 mg/kg		-		47 mg/kg	
USEPA RSL for Residential Soils	160 mg/kg		63 mg/kg		16 mg/kg	
USEPA RSL for Industrial Soils	2,300 mg/kg		930 mg/kg		230 mg/kg	
USEPA RSL for Resident Soil to Groundwater	20 mg/kg		2.4 mg/kg		1.8 mg/kg	
Illeginni Islet Soil Sample Testing Results						
RGNext 2020	undetected ²		undetected ²		9 (out of 34) pre-test samples ranged between 1.8 mg/kg and 4.3 mg/kg	
	undetected ²		undetected ²		7 (out of 24) post-test samples ranged between 1.8 mg/kg and 4.3 mg/kg	
DON 2019	0.089 mg/kg ³		3.0 mg/kg		23 samples ranged between 0.72 mg/kg and 5.1 mg/kg	
Robison et al. 2013	Crater ⁴ : <0.0027 mg/kg	Surroundings ⁵ : 2.1 ± 0.58 mg/kg	-	-	Crater ⁴ : 1.9 ± 0.17 mg/kg	Surroundings ⁵ : 22 ± 8.8 mg/kg
Robison et al. 2010	2.3 ± 0.5 mg/kg ⁶		-		37 ± 19 mg/kg ⁷	
Robison et al. 2006 ⁸	1.6 ± 0.32 mg/kg		-		24 ± 6.1 mg/kg	
Robison et al. 2005 ⁹	0.027 ± 0.11 mg/kg		-		1.6 ± 0.41 mg/kg	

Acronyms and Abbreviations: mg/kg = milligrams per kilogram, RSL = Regional Screening Level, USEPA = U.S. Environmental Protection Agency

¹ Compliance Goals set by the UES (USASMDC 2024). Where UES Compliance Goals were not specified, USEPA RSLs were used as Compliance Goals instead (USEPA 2022b, USEPA 2022c, USEPA 2022d).

² Above Method Detection Limit, but below Limit of Quantification

³ A duplicate sample detected 1.9 mg/kg of beryllium. This large discrepancy may be due to the heterogeneous nature of the soil matrix (gravelly sand).

⁴ Mean of 8 samples taken from the berm of the crater.

⁵ Mean of 16 samples taken on all sides of the helipad.

⁶ Most conservative (highest) composite value for the five half-acre plots in the target area. Mean of 24 samples taken south of the helipad, within a predetermined 0.5-acre plot.

⁷ Most conservative (highest) composite value for the five half-acre plots in the target area. Mean of 18 samples taken west of the helipad, within a predetermined 0.5-acre plot.

⁸ Mean of 105 samples taken in the target area.

⁹ Mean of 21 samples taken in the beach areas.

3.2.5 Water Resources – Kwajalein Atoll

3.2.5.1 Region of Influence

The ROI for water resources include areas subject to the effects of the Proposed Action including:

- The proposed deep ocean water impact site at KMISS (**Figure 2.1.4-2**).
- The proposed payload impact site on Illeginni Islet (**Figure 2.1.4-3**); and
- Test support facilities and vessel operation locations at Kwajalein Atoll to be used for the Proposed Action.

3.2.5.2 Affected Environment Deep Offshore Waters

KMISS is a deep ocean sensor array located approximately 3.2 to 8.6 nm east of Gagan Islet. The coastal waters are in a high-energy environment. Strong currents from tidal exchange and swells from the south and southwest are common, along with wrap-around effects from swells originating from the east (USASMDC 2014a). Surface seawater often has a pH between 8.1 and 8.3 (slightly basic), but generally is very stable with a neutral pH (U.S. Army 2021). The amount of oxygen present in seawater varies with the rate of production by plants, consumption by animals and plants, bacterial decomposition, and surface interactions with the atmosphere (U.S. Army 2021). The general composition of ocean water includes water, sodium chloride, dissolved gases, minerals, and nutrients (U.S. Army 2021). The most important physical and chemical properties are salinity, density, temperature, pH, and dissolved gases (U.S. Army 2021). For oceanic waters, the salinity is approximately 35 parts of salt per 1,000 parts of seawater (U.S. Army 2021).

3.2.5.3 Affected Environment Illeginni Islet

Freshwater resources at USAKA consist of rainwater obtained from catchments and groundwater lenses beneath the larger islands. Groundwater at Illeginni Islet is not considered a viable source of potable water as it is currently deemed to be too saline and not available year-round (U.S. Air Force 2021). Marine resources include both lagoons and the ocean, which furnish habitats in the shallow marine water for plants and animals. Numerous species are of subsistence value to the Marshallese (USASMDC 2024).

Kwajalein Atoll's geographical location gives it a tropical marine climate with a wet and a dry season. The dry season is from mid-December to mid-May when the atoll experiences east-northeasterly trade winds. The wet season is from mid-May to mid-December. Annual rainfall is approximately 100 inches with around 72% occurring during the wet season (AST 2023).

The Illeginni Islet land impact site has been used for DoD testing of payloads for decades. There has been concern about payload components leaching into groundwater on the islet due to this military testing. In 2018, seven groundwater monitoring wells were installed to facilitate pre- and post-flight test groundwater monitoring following tests that utilize the Illeginni Islet

impact site (RGNext 2020). September 2018 groundwater sampling results following a missile flight test showed beryllium was not detected, uranium was detected in three of nine samples (not exceeding the USEPA Maximum Contaminant Level screening level), and tungsten was detected in seven of nine samples (**Table 3.2.5-1**; DON 2019). In groundwater samples collected within the impact crater for that test, tungsten concentrations averaged 650 micrograms per liter (µg/L) (DON 2019). All detected tungsten concentrations exceeded the USEPA residential tap water screening level (**Table 3.2.5-1**).

A 2020 report for a flight test event described pre-test and post-test groundwater results for uranium, beryllium, and tungsten at seven wells on Illeginni Islet (RGNext 2020). The pre-and post-test sampling showed little variation in values, with beryllium remaining undetected, tungsten exceeding residential tap water screening levels, and uranium well below the USEPA maximum contaminant level for drinking water (**Table 3.2.5-1**; U.S. Air Force 2021). Tungsten was detected in 8 of the 12 groundwater samples collected (RGNext 2020). Where detected, tungsten concentrations ranged from 2.3 µg/L to 990 µg/L (U.S. Air Force 2021) which is higher than the USEPA Regional Screening Level for residential tap water. Under UES standards the groundwater at Illeginni is not a source of potable water; therefore, the USEPA Regional Screening Level is only used for a screening comparison, not a water quality standard, and baseline groundwater tungsten concentrations at Illeginni Islet do not pose a risk to human health.

Table 3.2.5-1. Groundwater Screening Levels and Historical Sampling at Illeginni Islet

Category or Study	Beryllium (Be)		Tungsten (W)		Depleted Uranium (DU)	
Regulatory Compliance Goals and Screening Levels						
UES Compliance Goals ¹	4 µg/L		-		-	
USEPA Maximum Contaminant Level	-		-		30 µg/L	
USEPA Regional Screening Levels (RSL)	-		0.016 mg/L (16 µg/L)		-	
Illeginni Islet Groundwater Sample Testing Results						
RGNext 2020	Pre-test: undetected	Post-test: undetected	Pre-test: 990 µg/L ²	Post-test: 63 µg/L	Pre-test: 5.4 µg/L ³	Post-test: 5.0 µg/L ⁴
DON 2019	undetected		Crater: 650 µg/L (range of 640 to 670 µg/L)	Surroundings: 7 detections (out of 9 samples) ranged from 55 µg/L to 1,200 µg/L	3 detections (out of 9 samples) < 30 µg/L	

Abbreviations: mg/L = milligrams per liter, µg/L = micrograms per liter

¹ Where UES Compliance Goals were not specified, EPA Residential Tap water RSLs (USEPA 2022e) were used as compliance goals instead.

² Most conservative (highest) of 7 detections (out of 9 samples).

³ Most conservative (highest) of 12 detections (out of 12 samples).

⁴ Most conservative (highest) of 3 detections (out of 3 samples).

Except for several point and non-point sources, the marine water around USAKA is generally free of pollution. Water quality is maintained by the natural conditions of tidal and trade-wind currents that dilute and transport pollutants. Water quality can be degraded by wastewater, thermal discharges, stormwater runoff, sandblasting and construction debris, solid waste disposal, and landfill leachate.

As required under Section 3-6.5.8 of the UES, groundwater monitoring plans are currently being developed by USASMDC to ensure sampling consistency for Illeginni Islet groundwater sampling events.

3.2.6 Hazardous Materials and Waste Management – Kwajalein Atoll

3.2.6.1 Region of Influence

For the analysis of hazardous materials and waste management at Illeginni Islet, the ROI is defined as the 7.6-acre impact site for CPS flight tests located on the west end of the islet, as well as the immediate area near the impact site where test-support equipment would be placed.

For the analysis of hazardous materials and waste management at KMISS, the ROI is the deep-water range area.

3.2.6.2 Affected Environment

At Illeginni Islet, the U.S. Army has previously removed all remaining hazardous materials and wastes (e.g., asbestos, polychlorinated biphenyl [PCB] items, and cans of paint) from buildings and facilities. Hazardous wastes are accumulated for up to 90 days and shipped off-island for disposal in the continental United States. At the 90-Day Storage Facility, sampling of waste is performed (for waste from uncharacterized waste streams) and waste is prepared for final off-island shipment for disposal. (U.S. Army 2021)

Illeginni Islet has been used as a target site by the U.S. military for various hypersonic missile programs since the early 1990s. Due to prior missile testing on Illeginni Islet, residual concentrations of beryllium, depleted uranium, and tungsten remain in the soil near the existing helipad on the west side of the islet as described in **Section 3.2.4.3**. Groundwater sampling results at Illeginni Islet have shown beryllium as undetected, residual concentrations of depleted uranium not exceeding the USEPA Maximum Contaminant Level screening level, and tungsten below the USEPA Regional Screening Level for residential and commercial areas (see **Section 3.2.5**). Under UES standards the groundwater at Illeginni is not a source of potable water due to high salt concentrations, and baseline groundwater concentrations of tungsten at Illeginni Islet (see **Section 3.2.5**) do not pose a risk to human health. (U.S. Army 2021, RGNEXT 2020)

The affected environment for KMISS is the deep-ocean range just off Gagan Islet as described in **Section 3.2.5.2**.

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3.2.7 Environmental Justice – Kwajalein Atoll

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3.2.7.1 Region of Influence

The ROI for environmental justice includes KMISS, Illeginni Islet, and other locations within Kwajalein Atoll where proposed activities would take place.

3.2.7.2 Affected Environment

RTS has been used as a target site for DoD missile flight test programs since the 1990s. Illeginni Islet and Gagan Islet are uninhabited and only DoD personnel and contractors periodically work on these islets as part of range operations and mission support. Military personnel, commercial users, recreational users, and RMI citizens utilize the atoll lagoon, ocean waters surrounding Kwajalein Atoll, and RMI airspace at Kwajalein Atoll. These populations require “equitable access to a healthy, sustainable, and resilient environment in which to live, play, work, learn, grow, worship, and engage in cultural and subsistence practices” (88 FR 25251 [April 26, 2023]).

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Fisheries are an important component of the RMI economy and culture that depend on a healthy environment capable of supporting adequate fisheries resources. Any actions which have the potential to impact fisheries in the RMI are an environmental justice concern. In the RMI, marine fisheries have two distinct areas, offshore and coastal (FAO 2023). Coastal fishing is primarily for subsistence purposes and for sale in local and export markets. Offshore fisheries consist of commercial longlining, purse seining, and pole-and-line fishing and are focused on tuna (FAO 2023). The annual catch from RMI purse-seine vessels in 2014 was 79,562 metric tons, of which 18% was taken within the RMI EEZ (FAO 2023). Foreign offshore fleets operating within RMI waters caught over 51,000 metric tons of fish in 2014 with over 90% of the catch consisting of tuna (FAO 2023).

Subsistence and artisanal fishing are very important in the RMI, especially in the outer atolls and more remote islets where it provides residents with their primary source of animal protein (FAO 2023). Imported food has gained importance in the RMI since the 1960s, but the consumption of fish remains substantial and critically important to the outer islands (FAO 2023). Almost all artisanal catches in the RMI are marketed locally for food (FAO 2023) but part of the fisheries catch in the RMI includes non-food commodities such as mollusks, aquarium fish, and corals. Exports from the coastal commercial fisheries are primarily aquarium fish and coral going to U.S. markets and top shell snails for button factories in Asia and Europe (FAO 2023). Between 1950 and 1990, harvests from artisanal and subsistence fishing increased from 1,100 metric tons per year then stabilized at around 4,500 metric tons per year after 1990 (FAO 2023, Vianna et al. 2020). Subsistence and artisanal catches in the RMI are typically composed of approximately 75% finfishes and 25% invertebrates (Vianna et al. 2020). Top shell snails are generally exported rather than consumed locally and make up between 0.25 metric tons and 9 metric tons of the annual artisanal catch (Vianna et al. 2020). Sea turtles are an important part of Marshallese culture; they are featured in many myths, legends, and traditions, where they are

revered as sacred animals. Eating turtle meat and eggs on special occasions remains a prominent part of the culture (Kabua and Edwards 2010).

USAG-KA has conducted fish studies to evaluate the levels of pollutants in fish at USAKA after decades of testing and other military uses. USAG-KA conducted a fish study within Kwajalein Harbor in 2008 to assess human health risks (APHC 2017). In 2013, USAG-KA conducted another fish study in which fish and water samples were collected at several USAKA locations as well as locations which are not utilized by the U.S. military (APHC 2017). This study was conducted to discern whether previously observed contamination in fish tissue is specific to Kwajalein Harbor or is part of a wider contamination problem at USAKA (APHC 2017). The 2013 study revealed that contaminants of concern for human health present in fish at USAKA study sites included pesticides, PCBs, and lead (APHC 2017). Conclusions of the study were that contaminated fish consumption poses a risk for Marshallese adults and children at certain USAKA locations (APHC 2017). While historical and ongoing military and industrial activities at USAKA are contributing to contamination in the southern portion of Kwajalein Atoll, there is some evidence that, for certain substances, contamination may not be limited to USAKA military and industrial use locations but may be part of a ubiquitous problem (APHC 2017). Regardless of the causes of the fish contamination, results of these fish studies led to establishment of “no fishing” areas within Kwajalein, Illeginni, and Meck harbors as well as to several remediation projects at Kwajalein to eliminate contamination sources (U.S. Air Force 2021, APHC 2017).

The Marshall Islands Marine Resource Authority manages and regulates fishing in the RMI under the Marshall Islands Marine Resources Act of 1997. As part of this Act, the Marine Resource Authority determines the total level of fishing and allocation of fishing rights, develops fishery management plans, protects species, establishes fisheries exclusion zones, limits the taking of sea turtles and other protected species, and regulates fishing gear, among other responsibilities (FAO 2023).

3.2.8 Health and Safety – Kwajalein Atoll

3.2.8.1 Region of Influence

The ROI for USAKA includes KMISS as a potential deep ocean target, the Mid-Atoll Corridor, Illeginni Islet, and Illeginni Islet nearshore waters (**Figure 2.1.4-2**).

3.2.8.2 Affected Environment

Since the 1990s, USAKA has been used as a target site for various DoD missile test operations. Illeginni and other islets within the Mid-Atoll Corridor are uninhabited, but personnel do periodically visit and work on some of the islets as part of range operations and mission support. Military, commercial, and public users of the atoll lagoon, surrounding ocean waters, and local airspace are also a safety consideration at USAKA.

All range operations must first receive approval from the RTS Safety Office. This is accomplished through presentation of the proposed program to the Safety Office. All safety analyses, standard operating procedures, and other safety documentation applicable to

operations affecting USAKA must be provided, along with an overview of mission objectives, support requirements, and schedule. The Safety Office evaluates this information and ensures that all RTS range safety requirements (including both ground and flight safety) and supporting regulations are followed. Final responsibility and authority for the safe conduct of missile and flight test operations lies with the USAG-KA Commander (USASMDC 2024).

Range safety provides protection to installation personnel, inhabitants of the Marshall Islands, and ships and aircraft operating in areas potentially affected by missions. Specific procedures are required for the preparation and execution of missions involving missile tests. These procedures are based on regulations, directives, and flight safety plans for individual missions. The flight safety plans include evaluating risks to inhabitants and property near the flight path, calculating trajectory and debris areas, and specifying range clearance and notification procedures. Criteria used at RTS to determine debris hazard risks are in accordance with Range Commanders Council 321-20 (RCC 2020). Radar and visual sweeps of hazard areas are accomplished immediately prior to operations to assist in the clearance of non-critical personnel, ships, and aircraft. Only mission-essential personnel are permitted in hazard areas. An NTM and a NOTAM are published and circulated in accordance with established procedures to provide warning to personnel, including residents of the Marshall Islands, concerning any potential hazard area that should be avoided.

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4.0 Environmental Consequences

This chapter describes the environmental consequences of the Proposed Action and No Action Alternative on the affected environment as described in **Chapter 3.0**. For each resource area carried forward for detailed analysis, this chapter includes descriptions of the ways in which the Proposed Action might impact the affected environment, analysis of potential impacts, and conclusions regarding the expected impacts of proposed activities. **Section 4.1** evaluates the environmental consequences of the No Action Alternative and **Section 4.2** evaluates the environmental consequences of implementation of the Proposed Action. **Section 4.3** includes an evaluation of the potential for cumulative effects on environmental resources from implementation of the Proposed Action in conjunction with other past, present, and reasonably foreseeable future actions in the study areas.

4.1 No Action Alternative

Under the No Action Alternative, proposed CPS flight tests and associated activities would not occur. Other DoD actions in both the Pacific and Atlantic study areas would continue to occur as evaluated in the relevant NEPA compliance documents cited in this EA/OEA and described below. The No Action Alternative of not conducting the proposed flight testing would not meet the purpose and need for the Proposed Action (**Section 1.2**). The environmental consequences of the No Action Alternative are evaluated in this section in order to determine if the No Action Alternative would change baseline conditions as presented in **Chapter 3.0** and to compare the degree of the potential environmental effects of the Proposed Action with the expected environmental conditions that would exist if the Proposed Action did not occur.

4.1.1 Broad Ocean Area – No Action Alternative

Under the No Action Alternative, the proposed CPS flight test program described in **Section 2.1** would not be implemented within the Atlantic and Pacific BOAs. Thus, there would be no CPS sea-based testing, and no CPS-related environmental impacts from launch activities or terminal flight operations. Other ongoing DoD training and testing activities, and military range operations would continue in portions of the Atlantic and Pacific BOAs. Navy training and testing has been occurring in the BOA OPAREAs and other portions of the BOAs for decades and would continue as evaluated in the Atlantic Fleet Training and Testing EIS/OEIS (DON 2018a), Hawaii-Southern California Training and Testing EIS/OEIS (DON 2018a), and the Mariana Islands Training and Testing EIS/OEIS (DON 2020a), among other programs. As a result, the environmental conditions described for the Atlantic and Pacific BOA affected environment in **Section 3.1** are not expected to change under the No Action Alternative and no impacts are expected for any resource considered.

4.1.2 Kwajalein Atoll – No Action Alternative

Under the No Action Alternative, the Navy would not conduct the proposed CPS flight testing activities at USAKA as described in **Section 2.1**. Other DoD activities not associated with the

Proposed Action would continue to occur at USAKA, including use of KMISS and Illeginni Islet as payload impact sites for missile testing. DoD testing at both KMISS and the Illeginni land impact site as well as other USAG-KA and RTS activities would continue as evaluated for several programs including but not limited to the GBSD (now Sentinel) and Minuteman III programs (U.S. Air Force 2021). As a result, the baseline environmental conditions described for the USAKA affected environment in **Section 3.2** are not expected to change under the No Action Alternative and no impacts are expected for any resource considered.

4.2 Proposed Action

Under the Proposed Action, proposed CPS flight tests and associated activities would occur as described in **Section 2.1**. The environmental consequences of the Proposed Action are evaluated in this section based on the conditions in the affected environment and the regulatory setting described in **Chapter 3.0** and **Appendix B**. Resource-specific evaluation criteria may be defined in this section but in general, impacts are categorized as either (1) no to negligible impacts, (2) minor impacts, (3) moderate impacts, or (4) significant impacts. Negligible impacts are those where there are undetectable levels of effect. Minor impacts would be those where effects would be detectable but would not noticeably modify, impair, or improve the function, quality, viability, or quantity of the resource. Moderate impacts would be those where effects are detectable and would noticeably modify, impair, or improve the aforementioned aspects of a resource. Significant impacts would be those that substantially change the function, quality, or quantity of a resource. Impacts may also be categorized as short-term, long-term, adverse, or beneficial.

4.2.1 Broad Ocean Area – Proposed Action

4.2.1.1 Air Quality – BOA

Effects on air quality are based on estimated direct and indirect emissions associated with the Proposed Action. There are no construction/demolition activities associated with the Proposed Action. The primary sources of emissions include launch and flight of the CPS AUR and exhaust emissions from launch platform and support vessels. There are no measured emissions data available for the developmental CPS AUR missile. For analysis purposes, CPS AUR emissions were estimated based on the amount of propellant to be used in the CPS vehicle compared to similar flight test vehicles with a similar fuel type for which measured emissions were available (**Table 4.2.1.1-1**; U.S. Air Force 2020a, Blanco Camargo 2022). Estimated annual emissions from CPS vehicle launch and flight would not exceed significant indicator levels for any criteria pollutants (**Table 4.2.1.1-1**).

Vessel operations for the Proposed Action would be a small fraction of naval vessel operations and total vessel traffic in both the Pacific and Atlantic study areas. Based on estimated annual emissions from marine support vessel operations within a Pacific Navy range (DON 2004), it is anticipated that the total 10-year emissions from marine vessels supporting the CPS flight tests

would be below the Prevention of Significant Deterioration limit of 250 tons per year for criteria pollutants.

In total, the estimated annual emissions that would be generated by the CPS AUR (**Table 4.2.1.1-1**) and supporting vessels would not exceed the Prevention of Significant Deterioration significant indicator levels for pollutants or concern for criteria pollutants. Therefore, impacts to air quality from criteria pollutants in the BOAs with implementation of the Proposed Action would be minor.

Table 4.2.1.1-1. Estimated Emissions for CPS Flight Tests

Activity Source	SO _x	CO	PM ₁₀	PM _{2.5}	HCl	NO _x	Stratospheric NO _x	CO ₂	CO ₂ e
CPS Vehicle Launch and Flight (tons per test)	0.0001	0.0007	0.36	0.25	0.28	0.03	0.01	2.51	3.34
Annual Total Emissions (tons per year)¹	0.001	0.006	2.86	2.00	2.23	0.25	0.11	20.09	26.69
Total Emissions for Proposed Action Flight Tests (tons)²	0.01	0.06	28.60	20.03	22.32	2.55	1.12	200.95	266.91
Significant Indicator Level (tons per year)	250	250	250	250	N/A	250	N/A	N/A	N/A

Acronyms and Abbreviations: CO = carbon monoxide, CO₂ = carbon dioxide, CO₂e = carbon dioxide equivalent, HCl = hydrochloric acid, N/A = not applicable, NO_x = oxides of nitrogen, PM_{2.5} = particulate matter less than or equal to 2.5 microns in diameter, PM₁₀ = particulate matter less than or equal to 10 microns in diameter, SO_x = oxides of sulfur.

¹ Assuming eight flight tests per year.

² Assuming a total of 80 flight tests conducted over a 10-year period.

Greenhouse Gases and Social Cost

As noted by the Council on Environmental Quality, climate change is a particularly complex challenge given its global nature and the inherent interrelationships among its sources, causation, mechanisms of action, and impacts. The Council on Environmental Quality published updated guidance on January 6, 2023, regarding how to evaluate GHG emissions and climate change under NEPA, which states that agencies should quantify reasonably foreseeable direct and indirect gross and net GHG emissions increases or reductions, both for individual pollutants and aggregated in terms of carbon dioxide equivalent (CO₂e). The guidance further suggests that agencies can provide comparisons of a project's GHG emissions to metrics that may be more familiar to the public.

Implementation of the Proposed Action in the Atlantic and Pacific BOAs would contribute directly to emissions of GHGs from the combustion of the rocket propellant in the layers of the earth's atmosphere. First-stage burn would be entirely within the troposphere and stratosphere. Second-stage burn would start in the stratosphere and end either in the stratosphere or the mesosphere depending on the trajectory selected.

To estimate CPS AUR CO₂ emissions, the amount of propellant to be used in the CPS vehicle was compared to similar flight test vehicles with a similar fuel type for which measured emissions were available (Blanco Camargo 2022). Based on the amount and type of fuel, CO₂

emissions would be approximately 2.51 tons per CPS flight test launch and CO₂e (including stratospheric nitrogen oxides) would be approximately of 3.33 tons per flight test.

The social cost of GHG is the monetary value of the future net damages associated with adding one ton of that GHG to the atmosphere in a given year (USEPA 2022b). The Council on Environmental Quality January 2023 guidance states that agencies should quantify a project's reasonably foreseeable direct and indirect gross and net GHG emissions and monetize the social cost of those GHG emissions. The guidance also encourages agencies to avoid and mitigate GHG emissions to the greatest extent possible (CEQ 2023). The current federal estimated cost is \$51 a ton for every additional ton of CO₂ emitted into the atmosphere (Resources for the Future 2022). Based on the estimated CO₂ emissions for the Proposed Action, the total estimated social cost of GHG would be \$128.01 per flight test, \$1,024.08 per year, and up to \$10,240.80 for the 10-year Proposed Action (**Table 4.2.1.1-2**).

Based on the global and the U.S. GHG emissions for CO₂ the potential impact from implementation of the Proposed Action would be a less than 0.0001% increase in the global GHG levels. Therefore, Proposed Action impacts to air quality from GHGs in the BOAs would be minor.

Table 4.2.1.1-2. Estimated Greenhouse Gas Emissions Compared to Baseline Conditions and Social Cost of Greenhouse Gases

Emissions of CO ₂ (tons per year)	
Estimated Proposed Action Greenhouse Gas Emissions	20.09
Global Greenhouse Gas Emissions	41,216,000,000
Proposed Action Percent of Global Emissions	0.000005%
United States Greenhouse Gas Emissions	6,340,000
Proposed Action Percent of United States Emissions	0.0003%
Social Cost of Greenhouse Gases	
Federal Social Cost for One Ton of Additional CO ₂	\$51.00
Proposed Action Social Cost of Greenhouse Gases Per Flight Test	\$128.01
Proposed Action Social Cost of Greenhouse Gases Per Year ¹	\$1,024.08
Proposed Action Total Social Cost of Greenhouse Gases ²	\$10,240.80

Sources: Global baseline emissions from Global Carbon Project 2024, United States baseline emissions from USEPA 2024

Acronyms and Abbreviations: CO₂ = carbon dioxide, CO₂e = carbon dioxide equivalent.

¹ Assuming eight flight tests per year.

² Assuming a total of 80 flight tests conducted over a 10-year period.

4.2.1.2 Biological Resources – BOA

Environmental consequences of the Proposed Action on biological resources are evaluated based on the best available information about species distributions and in the context of the regulatory setting discussed in **Appendix B, Section B.3.2.1** and criteria detailed in **Appendix D**.

The Proposed Action has the potential to impact biological resources in the BOA ROI through exposure to elevated sound levels, direct contact from vehicle components, exposure to hazardous materials, and vessel activity. These potential stressors for biological resources in the BOA ROI and the environmental consequences of those stressors on biological resources are described in detail in the Navy CPS Marine Biological Evaluation (DON and USASMDC 2024) and in **Appendix D**. This section provides a brief summary of consequences for biological resources in the environment described in **Section 3.1.2**, but additional analysis details relevant to this section can be found in **Appendix D, Section D.1**.

Because the Proposed Action is a Navy test action occurring primarily within existing Navy training and testing areas, proposed operations in the BOA would implement a number of standard operating procedures and mitigation measures, any of which were established in the Atlantic Fleet Training and Testing EIS/OEIS (DON 2018a), the Hawaii-Southern California Training and Testing EIS/OEIS (DON 2018b), the Mariana Islands Training and Testing EIS/OEIS (DON 2020a), and the Point Mugu Sea Range EIS/OEIS (DON 2022a). **Appendix C, Section C.3.1** details the standard operating procedures and mitigation measures to be implemented to minimize the potential effects of the Proposed Action on biological resources.

Elevated Sound Levels

The Proposed Action would result in elevated sound levels both in air and in water. Sources of elevated sound levels in the BOA ROI would include launch of the CPS flight test vehicle from a naval vessel, flight of the CPS vehicle over the ocean, splashdown of the spent boosters into the ocean and impact of the payload in deep ocean waters outside EEZs in international waters.

The potential effects of elevated sound pressures on wildlife and acoustic analysis methodology are detailed in **Appendix D, Section D.1** and DON and USASMDC 2024.

Proposed flight test noise has limited potential to affect the behavior and hearing sensitivity of wildlife. Some of the louder sounds generated by proposed activities have the potential to physically injure or cause temporary auditory injury in some of the most common and widely distributed marine wildlife such as abundant species of pelagic fish. However, given the limited number of tests per year (maximum eight per year over 10 years) and the limited potential of flight test noise to affect wildlife, elevated sound pressures would not change the relative population size or distribution of any wildlife species. For special-status species (including marine mammals and sea turtles), which generally have low densities in the ROI, it is not expected that animals would be exposed to sound pressures high enough to cause physical injury. Elevated sound levels might cause wildlife to quickly react, briefly altering their normal behavior, but wildlife are expected to return to normal behaviors within minutes of the short

duration sounds (NMFS 2019). No long-term behavioral effects or meaningful health effects are expected for any special-status species. The impacts of elevated flight test noise levels on wildlife, including special-status species, would be negligible to moderate.

Direct Contact

Biological resources in the BOA ROI may be affected by direct contact from test components entering marine habitats in the BOA, including the spent stage 1 boosters splashing down downrange of launch and up to 330 nm from land and stage 2 boosters splashing down and the CPS payload impacting in deep ocean waters outside of EEZs. These falling components would enter marine habitats and have the potential to injure marine organisms. Direct contact from flight test components is not expected to have a discernable or measurable impact on benthic or planktonic invertebrates or vegetation because of their abundance and wide distribution. The potential exists, however, for impacts to larger vertebrates in the open ocean area, particularly those that must come to the surface to breathe (e.g., marine mammals and sea turtles) or that feed at the surface (e.g., seabirds).

Based on the expected dimensions of CPS vehicle components and the best available information on marine mammal and sea turtle densities in the BOA, no direct contact with these special-status species is expected. The calculated chances for direct contact are extremely low, even when summed across eight potential tests per year over 10 years, and the impacts of direct contact on these species would be minor to non-existent.

Reliable density estimates are not available for special status fish or seabird species in the BOA. However, if it is assumed that densities of special-status fish and seabird species in the ROI are similar to densities of marine mammals, it is very unlikely that special status fish or seabirds would be exposed to direct contact. Some more common and abundant pelagic fish species may have individuals which would be exposed to direct contact; however, direct contact would not change the regional population size or distribution of these common species due to their relatively large population sizes and wide-ranging distributions in the BOA. Overall, direct contact would have minor to no impact on marine wildlife in the ROI.

Hazardous Materials

Biological resources in the BOA ROI may be affected by exposure to hazardous materials entering marine habitats or by ingestion of debris from proposed activities in the BOA. Biological resources might be exposed to materials of which the spent boosters and payload are composed or are contained within the boosters or payload (**Table 2.1.1-1** and **Table 2.1.1-2**). The propellant would be consumed during the flight tests; therefore, only a minimal residual amount of propellant would enter the ocean. All durable materials of which the AUR components are composed or that are contained within the boosters or payload are expected to sink to the ocean bottom. Booster splashdown and payload impact would occur within deep ocean waters downrange from launch and up to 330 nm from land. For tests using a floating target raft, the raft is expected to remain relatively intact and floating. Little to no floating debris would be expected and any visible debris found floating would be collected for disposal as much

as practicable. It is not planned or expected that the target raft would be sunk during Navy CPS flight test activities.

Hazardous material release in the BOA is not likely to adversely impact marine biological resources. Any hazardous material introduced into the BOA is not expected to have a discernable or measurable impact on benthic or planktonic invertebrates or vegetation because of their abundance, their wide distribution, and the protective influence of the mass of the ocean around them. The potential exists, however, for larger vertebrates in the open ocean area to be exposed, particularly those that must come to the surface to breathe (e.g., marine mammals and sea turtles) or that feed at the surface (e.g., seabirds).

Some of the chemicals contained in the spent boosters and payload are potentially harmful to marine wildlife at higher concentrations. However, components would sink to the ocean bottom and any chemicals introduced to the water column would be quickly diluted and dispersed. Most wildlife, including special-status wildlife are not likely to come into contact with test components or with chemicals at concentrations that could harm them. Any delayed release of chemicals from test components would occur in deep ocean waters and would be quickly diluted to low concentrations which would not cause harm to marine wildlife. Wildlife are unlikely to ingest or become entangled in components because they are expected to sink to the deep ocean floor where most species and their prey are not likely to occur. Hazardous materials would have negligible to minor impacts on biological resources in the BOA ROI.

Vessel Movement

The Proposed Action would involve vessel movement in the Atlantic and Pacific BOAs for approximately up to 4 weeks for each flight test. Vessel activity would include operation of surface ships and submarines as launch platforms; two to three support ships for downrange sensor coverage; a support ship and smaller watercraft for downrange target placement, clean-up activities, and recovery operations; and operation of a target raft and up to 12 self-stationing instrumented sensor rafts around the target site. No anchoring systems would be used for self-stationing rafts and rafts would be powered by small battery-powered trolling motors.

While proposed activities involve vessel operations in the BOA, operation of these vessels would occur in compliance with a number of standard operating procedures and mitigation measures to protect special-status biological resources (**Appendix C, Section C.3.1**). Ship personnel would monitor for marine mammals and sea turtles to avoid potential vessel strikes during operations. No vessel equipment is expected to pose an entanglement risk for wildlife.

Proposed vessel movement has the potential to increase strike risk for marine wildlife, especially wildlife which must surface to breathe (i.e., sea turtles and marine mammals). This risk is greatest for relatively slow-moving species and has the greatest potential for adverse impacts to special status species such as large marine mammals and sea turtles. Because Proposed Action vessel operation would only occur over a short period of time (up to 4 weeks) for each test and because these vessels are routinely used in the BOA as part of other DoD programs, the use of these vessels would not meaningfully increase vessel traffic in the BOA.

The self-stationing rafts and target rafts would be slow moving and powered by small battery-powered trolling motors; therefore, the rafts would pose very little strike risk for wildlife. With implementation of standard operating procedures and mitigation measures to detect and avoid marine mammals and sea turtles, special-status marine wildlife are unlikely to be struck by vessels operating for the Proposed Action. Vessel movement as a result of the Proposed Action would have minor to no impacts on marine biological resources in the BOA.

Consequences for Special Status Wildlife

Threatened and Endangered Species. Pursuant to the ESA, the Navy has evaluated the potential effects of the Proposed Action on ESA listed species, candidate species, and designated critical habitats in a CPS Marine Biological Evaluation (DON and USASMDC 2024). The Navy has concluded that proposed activities in the BOA would have *no effect* on ESA-listed birds and *may affect but are not likely to adversely affect* ESA-listed species of marine mammals, sea turtles, and fish in the BOA (**Table 3.1.2-1**). The Navy consulted with NMFS on the potential effects of the Proposed Action on marine ESA-listed species under Section 7 of the ESA (see communications in **Appendix E**).

Marine Mammal Protection Act. The Navy has concluded that proposed activities, including noise, would not result in take of marine mammal species in the ROI. The chances of any marine mammal being harmed by elevated sound levels, direct contact, hazardous materials, or vessel strike are extremely low. If any effects of proposed flight test noise on marine mammals were realized, they would be expected to be limited to short-duration startle response with no lasting or physiologically meaningful effects. Proposed activities are not expected to cause any disturbance to marine mammals which would result in abandonment or significant alteration of behavioral patterns. Therefore, there would be no harassment of marine mammals. The chances of direct contact from test components are extremely low and no animals are expected to be injured from direct contact, hazardous materials, or vessel strike.

Migratory Bird Treaty Act. The Navy has concluded that proposed activities would not result in any incidental take that might result in a significant adverse effect on the sustainability of a population of a migratory bird species protected under the Migratory Bird Treaty Act in the BOA ROI.

Consequences for Environmentally Sensitive Habitats

The primary ways that the Proposed Action might impact environmentally sensitive habitats is through introduction of hazardous materials or by direct contact from test components, target debris, or anchoring. Almost all of the environmentally sensitive habitats in the BOAs are in coastal, shelf, or slope areas where almost no proposed activities would occur. Implementation of proposed activities would include implementation of a number of standard operating procedures and mitigation measures to minimize potential effects to biological resources (**Appendix C, Section C.3.1**). Vessels may transit some biologically important areas in the BOA but would not change the quality or quantity of those habitats for marine species. Some submarine canyons and seamounts occur in the BOAs; however, test activities are not likely to

impact the quality or quantity of these habitats in the ROI. The following discussions focus on environmentally sensitive habitats which have regulatory protections.

Critical Habitat. The Proposed Action *may affect but is not likely to adversely affect* designated or proposed critical habitat for ESA listed species (DON and USASMDC 2024). With the exception of designated or proposed *Sargassum* critical habitat, designated or proposed critical habitats would not be used as launch, booster splashdown, or payload impact areas. While vehicle launch and spent stage 1 booster splashdown may occur within designated or proposed *Sargassum* critical habitat, proposed activities would not change the features necessary for sea turtle conservation and are not likely to adversely affect these critical habitats. Vessel activity might also occur within critical habitat areas but is not likely to adversely affect critical habitats. The Navy consulted with NMFS on the potential effects of the Proposed Action on designated and proposed critical habitats under Section 7 of the ESA and on threatened and endangered species as described above (see communications in **Appendix E**).

Essential Fish Habitat. Only vehicle launch from launch-platform vessels and stage 1 booster splashdown might occur within EFH and designated habitat areas of particular concern. All vessel operations related to the Proposed Action would be conducted with standard operating procedures and mitigation measures in place (**Appendix C, Section C.3.1**) similar to those used for routine Navy at-sea training and testing (DON 2018a, DON 2018b, DON 2020a), including prohibitions on anchoring within a 350-yard radius of live hard bottom. Navy Stage 1 booster splashdown may occur within EFH but would not significantly reduce the quality and/or quantity of EFH. The Proposed Action would have negligible adverse impacts on EFH in the Hawaiian Islands EEZ. The Navy consulted with the NMFS Pacific Islands Regional Office on the potential effects of the Proposed Action on EFH in the Hawaiian Islands U.S. EEZ (see communications in **Appendix E**).

Marine National Monuments and Sanctuaries. Because marine national monuments and national marine sanctuaries would be avoided during flight test planning, no booster splashdown or payload impact would occur there. Only vessel operations might occur within monuments or sanctuaries. No launch activities, anchoring or abandonment of materials are planned to occur within these areas and there would be no impacts to these marine protected areas.

4.2.1.3 Hazardous Materials and Waste Management – BOA

CPS Flight Test Vehicle

A maximum of 80 CPS AURs would be scheduled for splashdown in the Atlantic and Pacific Oceans over a 10-year period. All CPS AUR vehicle component materials, including the materials of which the boosters and fairings are composed and the materials carried within components, would be introduced in deep ocean waters of the BOAs. For analysis purposes, it is assumed that the substances carried on or of which the boosters and payload would be composed would be similar to those of the Joint Flight Campaign vehicle and payload (DON and U.S. Army 2022). Joint Flight Campaign vehicle and payload constituents which are listed as hazardous materials under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) include nitrogen gas, asbestos, lithium, silver, zinc, titanium, and copper

(**Tables 2.1.1-1 and 2.1.1-2**; DON and U.S. Army 2022, 40 CFR § 302.4). It is anticipated that hazardous material input from splashdown in a given area would be below CERCLA reportable quantities. The nitrogen gas would be primarily used or expelled prior to splashdown, thus the gas contained in the boosters would be below the CERCLA reportable quantity of greater than 10 pounds at splashdown. The amount of asbestos which might be on the vehicle is unknown at this time, but it would likely be within the structure of the second stage. Lithium would be contained within batteries present on the vehicle stages and payload. The amount of lithium which would be contained within the AUR is not available, nor is that information available for the Joint Flight Campaign vehicle. However, if it is assumed that all lithium batteries on the boosters (up to nine) would be the maximum size (40 pounds) and that they would contain an average amount of lithium for these types of batteries (Pagliaro and Meneguzzo 2019), a maximum quantity of lithium on the boosters would be 4.9 pounds. Similarly, assuming the payload would have three lithium-ion batteries weighing 50 pounds, the maximum lithium content would be 2.0 pounds. CERCLA reportable quantities of lithium are greater than 10 pounds; therefore, lithium on a CPS AUR flight test would not exceed reportable quantities. The metals listed as hazardous materials under CERCLA which would be part of the CPS vehicle have reportable quantities of 1,000 pounds (for silver, zinc, and titanium) to 5,000 pounds (for copper). Quantities of these metals in the CPS vehicle are not expected to exceed CERCLA reportable quantities.

The principal source of potential impacts on water and sediment quality would be unburned rocket propellant residue and batteries. Each of the two rocket motor boosters would exhaust onboard propellant before dropping into the ocean. Rocket propellant normally contains 50 to 85% ammonium perchlorate by weight and 5 to 22% aluminum powder, a fuel additive (DON 2018a). Based on USEPA and other studies evaluating munitions constituents at military sites where explosives and propellants have been used, the USEPA concluded that perchlorate was generally not detected at ranges and that perchlorate is so soluble in water that surface accumulation (on land) does not occur (DON 2018a). Studies have concluded that the motors used in rockets and missiles are highly efficient, consuming over 99% of the rocket propellant perchlorate during use (DON 2018a). It is expected that only trace amounts, likely at undetectable levels, of propellant would remain in boosters when they splash down into the ocean (DON 2018a).

De minimus residual quantities of some hazardous materials may remain on the boosters and fairings (including batteries); these would be carried to the ocean floor by the sinking components and would undergo changes in the presence of seawater. When metals are exposed to seawater, they begin to corrode but movement of metals into the sediments or water column would be slow and restricted to a small area around the metals (DON 2018a). Residual materials would slowly dissolve and substances would be redistributed and diluted by physical ocean mixing and diffusion (DON 2018a). Any residual chemical concentration near submerged boosters would decrease over time as the leaching rate decreases and further redistribution and dilution occurs. Even at active military bombing sites, studies have revealed low concentrations of metals, generally below minimum detection limits (DON 2018a). Expected metal concentrations at BOA sites where CPS components enter the ocean would be expected to be

significantly lower than at active bombing ranges given the size of the BOA and likely distribution of CPS components. Therefore, metals would likely be undetectable in surrounding sea water and sediments.

Overall, hazardous materials are not expected to be found in concentrations high enough to adversely affect human environmental quality or habitat quality for marine life in the ROI. No detectable chemical, physical, or biological changes in water or sediment quality would be expected (DON 2018a). CPS flight test vehicle components would not contribute to floating or suspended marine debris as they are expected to sink to the ocean floor. From the cumulative aspect, it is anticipated that over the 10-year period and 80 CPS AUR splashdowns, the amount of hazardous materials in the deep ocean waters would remain below the 1,000 pounds CERCLA reportable quantity limits for nitrogen gas, silver, zinc, and titanium and the 5,000 pounds for copper. The amount of lithium deposited into the deep ocean waters over the 10-year period could exceed the greater than 10 pounds limit, but it is anticipated that the leaching rate described above would maintain a low concentration of metals, generally below minimum detection limits. Overall, based on the amount and expected post-test location of residual hazardous materials and wastes contained on the CPS flight test vehicle, hazardous materials and wastes are expected to have negligible to minor impacts on environmental quality in the ROI.

BOA Floating Targets

No hazardous materials are expected to be released for the floating target rafts. The raft would be deployed from a support ship prior to the flight test and would remain on-station for several hours using small electric motors. It is not planned or expected that target rafts would be sunk during flight test activities. All lithium-ion batteries used on the target raft for sensor operation would be recovered unless they were inadvertently damaged beyond the point of safe retrieval/recovery. It is considered unlikely that damage beyond the point of recovery would occur and lithium on the CPS AUR would not exceed reportable quantities. During post-flight activities the rafts would be loaded onto a support ship for transport back to the appropriate port. No release of hazardous material and waste is anticipated from the use of floating target rafts in the BOAs and there would be no impacts to environmental quality.

4.2.1.4 Health and Safety – BOA

Under the Proposed Action for CPS flight tests within the Atlantic and Pacific BOAs, no significant impacts on health and safety would be anticipated. CPS missile launches, and downrange sensor and target area support operations, would take place using existing naval vessels. Vessel operations would only occur when weather and sea conditions were acceptable for safe travel.

Through the application of DoD and Navy health and safety requirements identified in **Appendix B, Section B.8.2.1**, missile test programs are conducted with minimal risk to military personnel, contractors, and the general public. The launches would occur on naval vessels. Applicable safety procedures would be followed to prevent hazard risks to on-board personnel. As

described in **Sections 2.1.5** and **3.1.4.2**, NOTAMs and NTMs would be issued for potential hazard areas to ensure the safety of personnel and public on aircraft and vessels.

For the CPS flight tests, range safety representatives for the Navy would closely coordinate development of risk analyses based on the trajectories, probability for system failure, and the population density of any islands near missile flight paths. Should a flight abnormality occur, the Flight Termination System destruct package on the missile or payload would be activated to stop forward thrust and flight. Computer-monitored destruct lines, based on predetermined no-impact lines along flight paths, are preprogrammed to avoid any debris from falling onto inhabited areas consistent with range safety protocols and standard operating procedures. In accordance with Range Commanders Council 321-20 (RCC 2020), Navy Range Safety officials would not allow a flight test to proceed if the calculated risk exceeds a probability of casualty for individuals within the general public that is greater than 1 in 1,000,000 for any single mission. The low potential for a flight failure, combined with the low density of vessels in the open ocean, makes any potential impact from spent booster stages or other missile debris discountable.

All BOA target sites would be outside of EEZs in international waters. For floating target rafts, applicable DoD and Navy safety procedures and regulations would be followed. Following a flight test with impact on a target raft, flight test personnel would assess the condition and safety status of the target raft before conducting necessary cleanup and equipment retrieval. All personnel would wear proper personal protective equipment, as necessary.

4.2.2 Kwajalein Atoll – Proposed Action

4.2.2.1 Air Quality – Kwajalein Atoll

Air Quality

Illeginni Islet. One flight test per year is planned to include payload impact at Illeginni Islet. The payload does not carry propellant and is not anticipated to release emissions at Illeginni. Payload impact would result in fugitive dust at the impact site. No estimates are available for emissions of criteria pollutants associated with fugitive dust created by payload impact on Illeginni Islet. Freshwater application would be used to minimize fugitive dust following impacts. Freshwater application on surfaces helps temporarily compact the soil, suppress dust, and contain/confine potential fugitive dust upon payload impact. Freshwater would not be allowed to flow to the lagoon or ocean and would evaporate in place. Terminal payload impact may volatilize minor quantities of some contaminants already present on Illeginni; however, it is anticipated that any emissions associated with impact would be within the UES air quality standards. Therefore, the emissions associated with payload impact (i.e., fugitive dust and any contaminants in the fugitive dust) are anticipated to have a negligible impact on air quality at Illeginni Islet.

KMISS. The payload does not carry propellant and is not anticipated to release emissions at KMISS. Therefore, the emissions, if any, associated with payload impact are anticipated to have a negligible impact on air quality at KMISS.

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Climate Change Consideration and Social Cost of Greenhouse Gases

Only the terminal portion of some CPS flight tests, which would involve payload flight and impact, would occur within Kwajalein Atoll. The payload does not carry propellant and would not release emissions. All propellant in the CPS vehicle would have been consumed in the stratosphere and upper atmosphere (as discussed in **Section 4.2.1.1**), well before payload impacts at USAKA. Therefore, GHG emissions, if any, would be negligible at Kwajalein Atoll. Because there would be no emissions from the CPS payload impact, there is no additional estimated social cost of the Proposed Action beyond the social cost discussed for the BOA in **Section 4.2.1.1**.

No mitigation measures or adaptation strategies have been established for Illeginni Islet or KMISS as it relates to climate change consideration.

4.2.2.2 Cultural Resources – Kwajalein Atoll

No significant impacts are anticipated to occur to archaeological or historic resources at Illeginni Islet. Under the Proposed Action, the current target site on the west end of Illeginni Islet would be used as a target for CPS flight tests. Such flight tests would be in addition to the current impact activities that occur there. Previous archaeological investigations of Illeginni Islet have not found indigenous cultural materials nor evidence of subsurface archaeological deposits. Seven buildings on the islet are eligible for listing in the RMI NRHP under the Cold War Missile Defense historic context and three of those are considered historically significant. All seven buildings are located in the center and east end of the islet, away from the target site.

The west end of the islet has been used as a target site since the 1990s. The types of activities that would occur under the Proposed Action are similar to those analyzed in prior environmental analysis documents (U.S. Air Force 2021, DON 2019). Should previously unidentified cultural features be discovered during implementation of the Proposed Action, the UES (USASMDC 2024) contains procedures for handling such inadvertent discoveries.

4.2.2.3 Biological Resources – Kwajalein Atoll

Environmental consequences of the Proposed Action on biological resources are evaluated based on the best available information about species distributions and in the context of the regulatory setting and criteria presented in **Appendix B, Section B.3**.

The Proposed Action has the potential to impact biological resources in the Kwajalein Atoll ROI through exposure to elevated sound levels, direct contact from payload impact and ejecta, exposure to hazardous materials, and increased human activity and equipment operation. These potential stressors for biological resources in the ROI and the environmental consequences of those stressors on biological resources are described in detail in the Navy CPS Biological Assessment for Kwajalein Atoll Activities (DON and USASMDC 2023) and in **Appendix D**. The following subsections briefly summarize the potential stressors for biological resources in the Kwajalein Atoll ROI and the environmental consequences of those stressors in

the environment described in **Section 3.2.3**, but additional analysis details relevant to this section can be found in **Appendix D, Section D.2**.

Over time and through consultation with NMFS and USFWS for RTS test activities at USAKA, several standard avoidance, minimization, and mitigation measures have been developed to minimize the impacts of flight testing on protected species and their habitats. The measures which would be implemented as part of the Proposed Action at Kwajalein Atoll (listed in **Appendix C, Section C.3.2**) are very similar to those implemented for other recent test programs with payload impacts at Illeginni Islet and KMISS (U.S. Air Force 2021, DON 2019, U.S. Army 2021). **Appendix C, Section C.3.2** summarizes the relevant and important standard operating procedures and mitigation measures to be implemented to minimize the potential effects of the Proposed Action on biological resources.

Elevated Sound Levels

The Proposed Action would result in elevated sound levels in air and in water at Kwajalein Atoll. Sources of elevated sound levels in the ROI would include payload impact on land at Illeginni Islet or the deep ocean waters of KMISS and a sonic boom from payload flight.

The potential effects of elevated sound levels on wildlife, effect thresholds, and analysis methods are discussed in detail in the CPS Biological Assessment (DON and USASMDC 2023) and **Appendix D, Section D.1**.

Proposed flight test noise has limited potential to affect the behavior and hearing sensitivity of wildlife. Some of the louder sounds generated by proposed activities have the potential to physically injure or cause temporary auditory injury in some of the most common and widely distributed marine wildlife, such as common and abundant species of fish. However, given the limited number of tests per year (maximum eight per year terminating at USAKA) and the limited potential of flight test noise to affect wildlife, elevated sound pressures would not change the relative population size or distribution of any wildlife species. For special-status species, no physical injury is expected due to elevated sound levels. Elevated sound levels might cause wildlife to quickly react, briefly altering their normal behavior, but wildlife are expected to return to normal behaviors within minutes of the short duration sounds. No long-term behavioral effects or meaningful health effects are expected. The impacts of elevated flight test noise levels on wildlife, including special-status species, would be negligible to moderate.

Direct Contact

Biological resources in the Kwajalein Atoll ROI may be affected by direct contact from test components or impact ejecta. Sources of direct contact risk at USAKA include up to eight payload impacts per year in the deep ocean waters of KMISS and a maximum of one payload impact per year on Illeginni Islet. On Illeginni Islet, biological resources might also be exposed to debris and soil to be ejected from the point of impact or from ground borne shockwaves. Debris and ejecta might cover an area extending 200 to 300 ft from the point of impact and potentially damaging shockwaves might extend out as far as 123 ft from the point of impact.

Deep Offshore Waters. In the KMISS area, the payload would impact in deep ocean waters and direct contact from payload debris is not expected to affect marine wildlife. Based on the low expected densities of special-status marine wildlife in the deep ocean waters near Kwajalein Atoll, direct contact from payload debris is considered very unlikely (DON 2019) and no animals are expected to be struck. While individuals of some more common species of fish and invertebrates may be contacted by payload fragments, loss of these individuals would not meaningfully change the population size or distribution of these species at Kwajalein Atoll. Direct contact from payload impact or debris would have negligible impacts on marine wildlife in deep waters of the ROI.

Illeginni Islet. Because the land impact site is regularly used for DoD testing and vegetation around the helipad areas is managed, vegetation at the impact site is highly disturbed and unlikely to be negatively impacted by proposed activities. No protected vegetation species occurs within the land impact site. Some bird nesting habitat occurs within the impact site; however, this land impact site has been regularly used for training and testing activities for decades and the habitat continues to be suitable for bird nesting. To prevent birds from nesting on any support equipment after initial setup, the equipment would be appropriately covered with tarps or other materials and “scare” techniques (e.g., scarecrows, mylar ribbons, and/or flags) would be used on or near the equipment. Proposed activities are not expected to destroy or alter beach habitats suitable for sea turtle nesting. Proposed activities would not change the conditions that have shaped baseline habitat conditions at the site. Direct contact would have minor to moderate impacts on terrestrial vegetation and wildlife habitats.

Terrestrial wildlife, such as birds, in and near the payload impact site have the potential to be affected by direct contact within the impact site. Several avoidance and minimization measures would be implemented as part of the Proposed Action to protect birds (see **Appendix C, Section C.3.2**) at Illeginni Islet. With these measures in place and based on the expected number of black-naped terns with the potential to nest in the impact site, the impacts to black-naped terns and other birds from direct contact on Illeginni Islet would be minor to moderate. No sea turtle nesting has been observed on Illeginni Islet in over 25 years. Therefore, sea turtles are unlikely to occur in terrestrial habitats on Illeginni Islet and there would be no impact of direct contact on sea turtles on land or sea turtle nests.

A shoreline payload impact is not planned or expected and is considered unlikely. However, there is a chance that marine wildlife in nearshore reef habitats may be impacted by direct contact from natural debris ejected during crater formation. Based on a worst-case scenario analysis, debris and shock waves produced during a shoreline impact may injure individuals or colonies of UES coordination and consultation species. UES-consultation species which may be injured by debris as adults include six coral species, four mollusk species, and two fish species. These consultation species have all been observed at multiple Kwajalein Atoll islets and except for the coral *Acropora polystoma*, are common throughout Kwajalein Atoll. Several reef-associated fish, coral, and mollusk species listed as coordination species under the UES may also be injured or otherwise adversely affected during a shoreline impact. All of these species are present on islets throughout Kwajalein Atoll as well (**Table 3.2.3-3**). The entire reef area with

the potential for direct contact effects is small in comparison to the total comparable reef area surrounding and connected to Illeginni Islet and is considered extremely small compared to the comparable reef areas in the USAKA area and in Kwajalein Atoll (DON 2019). CPS activities would not result in appreciable reduction of any population or species at Illeginni Islet or Kwajalein Atoll and direct contact would have negligible to moderate impacts on marine wildlife in nearshore waters at Illeginni Islet.

Hazardous Materials

Biological resources in the ROI may be affected by exposure to hazardous materials entering terrestrial and marine habitats. Sources of potential exposure include materials of which the CPS payload is composed or are contained within the payload (see **Table 2.1.1-2**) and material used during operation of support vessels and equipment.

Mitigation measures and standard operating procedures would be employed to reduce potential impacts from hazardous materials as summarized in **Appendix C, Section C.3.2**. While every attempt would be made to clean up all visible metal and other fragments, it is possible and likely that some fragments would be too small to be recovered and a small amount of these heavy metals or other substances may remain in the terrestrial or marine environments at Illeginni Islet. Only trace amounts of hazardous materials are expected to remain in terrestrial areas.

Hazardous materials are not likely to adversely impact terrestrial or marine biological resources. Any hazardous material introduced into the land impact site is not expected to have a discernable or measurable impact on wildlife or vegetation because measures would be in place to clean up debris and contain any accidental spills or discharges from equipment. While some concern has been raised about the environmental effects due to the deposition and dissolution of tungsten from test activities at Illeginni Islet, no significant impacts are expected (see DON and USASMDC 2023 for a detailed description and analysis of the potential consequences of tungsten). In deep offshore waters, hazardous materials would be quickly diluted by ocean waters and debris fragments are expected to sink to the ocean bottom. Marine vertebrates, including special-status species, are unlikely to encounter chemicals at harmful concentrations. Overall, the impact of hazardous materials on biological resources at Kwajalein Atoll would be minor to negligible.

Human Activity and Equipment Operation

The Proposed Action would involve human activity and equipment operation on Illeginni Islet and other Kwajalein Atoll locations for up to 8 weeks for each flight test. Human activity and equipment operation would include aircraft and vessel operations to transport equipment and personnel; operation of self-stationing rafts in ocean and lagoon waters; personnel on Illeginni Islet to place test support equipment and for clean-up operations; and heavy equipment and truck operation to transport equipment, excavate the crater, screen debris, and backfill the crater with substrate ejected from the crater.

Vessel traffic would likely include several vessel round-trips to and from the impact sites to position the self-stationing sensor rafts and to clean up floating debris post-test. Given the low

densities of rare or special status marine wildlife in the ROI, the chances of an animal being impacted by human disturbance or being struck by a vessel are very low. No anchoring would occur in nearshore habitats and all equipment and personnel arriving via vessel would load and offload at Illeginni Harbor. No debris recovery or other cleanup activities are expected to be required in shallow nearshore waters. Impacts to marine wildlife from human disturbance or vessel operation would be negligible to minor.

Birds in and near the payload impact site on Illeginni Islet may be disturbed by human activity and equipment operation. However, measures would be in place to reduce the potential for impacts to nesting birds. Some birds may leave the area during the period of human activity and equipment operation, but no physical injury or nest abandonment is expected. Hauled-out or nesting sea turtles are unlikely to occur on Illeginni Islet and no proposed activities would occur in beach habitats. The impacts of human activity and equipment operation on terrestrial wildlife would be negligible to minor.

Consequences for Special Status Wildlife

UES Coordination and Consultation Species. The Navy has evaluated the potential effects of the Proposed Action on UES listed species and coordination habitats. The Navy has concluded that proposed activities at USAKA may affect coordination species and habitats but that those activities would not have significant effects on those resources. The Navy has completed its review of potential effects of the Proposed Action on coordination resources (pursuant to Section 3-4.6.3[a] of the UES) in this section and in **Appendix D, Section D.2** and submitted the Draft EA/OEA to the UES Appropriate Agencies as a preliminary review in compliance with Section 3-4.6.3(b) of the UES (USASMDC 2024).

The Navy has also concluded that the Proposed Action may affect but is not likely to adversely affect UES consultation cetaceans, sea turtles, and several fish, coral, and mollusk species; but that the Action may affect and is likely to adversely affect six UES consultation coral, three mollusk, and two fish species. The Navy prepared a Biological Assessment (DON and USASMDC 2023) to support consultation with NMFS and USFWS as required under Section 3-4.5.3 of the UES (USASMDC 2024) and initiated consultation on December 8, 2023 (see communications in **Appendix E**). USFWS issued a letter of concurrence with the Navy conclusion that sea turtles were not likely to be adversely affected by the Proposed Action (**Appendix E, Section E.2.4**). NMFS issued a biological opinion concluding that proposed activities were either not likely to adversely affect or were not likely to jeopardize the continued existence of UES consultation species (NMFS 2024b).

Consequences for Environmentally Sensitive Habitats

UES Coordination Habitats. The Navy has evaluated the potential effects of the Proposed Action on UES listed species and coordination habitats. The Navy has concluded that proposed activities at USAKA may affect coordination habitats at Illeginni Islet including bird nesting habitat and nearshore marine habitats but that those activities would not have significant effects on those habitats. While temporary disturbance of some habitats may occur, DoD testing has been occurring on Illeginni Islet for decades and CPS testing would not alter tempo of that

testing or the baseline condition of coordination habitats in the ROI. The Navy has completed its review of potential effects of the Proposed Action on coordination resources (pursuant to Section 3-4.6.3[a] of the UES) in this section and in **Appendix D, Section D.2** and submitted the Draft EA/OEA to the UES Appropriate Agencies as a preliminary review in compliance with Section 3-4.6.3(b) of the UES (USASMDC 2024).

4.2.2.4 Geology and Soils – Kwajalein Atoll

Navy CPS C-HGBs would impact the western side of Illeginni Islet and in the deep ocean waters of KMISS. This type of testing at Illeginni Islet has been previously analyzed in several environmental documents (U.S. Air Force 2004, U.S. Air Force 2010, U.S. Air Force 2021, USASMDC 2011, DON 2019). Impact within Illeginni Islet's forested area or in the adjacent reef and shallow waters would be unintentional and is unlikely to occur. The payload impact would be comparable to those in the Minuteman III tests and the Navy's Flight Experiment-2 test, which are used as bounding cases (U.S. Air Force 2004, DON 2019, RGNext 2020). For some CPS flight tests, a mass simulator may be utilized. The Navy anticipates approximately one land impact per year could occur at Illeginni Islet throughout the flight test program's 10-year period.

Based on Flight Experiment-2 post-flight test and Minuteman III reentry vehicle ejecta estimates at Illeginni Islet, CPS C-HGB impact crater ejecta would be expected to cover a semicircular area (approximately 120 degrees) extending up to 300 ft from the point of impact, with the density of ejecta decreasing with distance from the point of impact (RGNext 2020, U.S. Air Force 2021, U.S. Air Force 2004). Craters from Minuteman III reentry vehicles and Navy Flight Experiment flight tests have been documented to be 20 to 30 ft in diameter and 7 to 10 ft deep (U.S. Air Force 2004, RGNext 2020). During impact, the CPS payload particles could partially disintegrate into fugitive dust around the impact site and a short distance downwind. Based on the expected composition of the structure of the C-HGB (aluminum, steel, titanium, magnesium and other alloys, copper, fiberglass, chromate coated hardware, tungsten, plastic, Teflon, quartz, silicone) and if all payload particles were deposited into the top 1 inch of soil on Illeginni Islet, then the expected concentration of toxic heavy metals would be very low and below UES compliance goals.

The quantities of tungsten in the CPS vehicle would not exceed 1,000 pounds. The most stringent screening criteria is used for tungsten as the UES does not specify a Regional Screening Level (**Table 3.2.4-1**).

Based on historical soil testing results from Illeginni Islet (**Table 3.2.4-1**) observed soil concentrations of tungsten, beryllium, and depleted uranium on Illeginni Islet from prior impact tests do not exceed the UES Compliance Goals, and therefore do not require assessing the need for a soil cleanup operation (RGNext 2020, U.S. Air Force 2020a, U.S. Air Force 2021). Comprehensive soil analyses have shown that the concentrations of beryllium and uranium on Illeginni Islet are at the natural background concentrations found in soils on other coral atolls in the northern Marshall Islands and at other global locations, and additional missile tests would not cause redistribution of the pre-existing contaminants on the islet (RGNext 2020, Robison et al. 2005, Robison et al. 2006, Robison et al. 2010, Robison et al. 2013).

At Illeginni, no CPS post-flight test assessment or cleanup activities would occur until: (1) unexploded ordnance personnel from USAG-KA inspect the impact area, and (2) trained personnel stabilize any fugitive dust and disturbed soil by wetting/washing the site. Personnel working in the impact area would wear proper personal protective equipment, as necessary. Once the site is cleared for safe entry, test support personnel would conduct an impact assessment of the site, and initiate cleanup and recovery operations.

Although unlikely due to the high speed of impact, any debris from the C-HGB impact on land would be recovered. Post-test recovery operations on Illeginni Islet would require the manual cleanup and removal of any visible C-HGB debris, including hazardous materials. Excavated material would be screened, and the collected C-HGB debris washed before packaging for shipment back to Kwajalein Islet and the United States for appropriate disposal. In addition, soil samples taken from Illeginni Islet would be tested to ensure that concentrations of tungsten, beryllium, and uranium (as a surrogate for depleted uranium) do not exceed established UES standards (USASMDC 2024, U.S. Air Force 2021). The crater formed by the C-HGB impacts would be backfilled using a backhoe/loader and repairs would be made to any structures on the islet, as necessary. Both test personnel and USAG-KA personnel normally would be involved in these operations.

Although unlikely due to the record of historical impact locations, if a test vehicle were to strike the shallow waters or reef flats adjacent to the proposed impact site at Illeginni, recovery/cleanup operations within 1,000 ft of the Illeginni shoreline would be conducted similarly to land operations when tide and water depth permit doing so (U.S. Air Force 2021). A backhoe would be used to excavate the crater, excavated material would be screened for debris, and the crater would be back-filled with coral and sediment ejected around the rim of the crater (U.S. Air Force 2021). The chemical and structural form of the depleted uranium and beryllium is such that they are insoluble in soil. Thus, they are not toxic to plant life on the island (no soil to plant uptake). As a result of the lack of uptake of beryllium and uranium by plants on Illeginni, there is no exposure to humans from the ingestion pathway from consumption of coconuts, Pandanus fruit, or other food crops (Robinson et al. 2005). While some studies have concluded that residual tungsten may dissolve and move through soil or groundwater, the potential effects of residual tungsten on biotic communities is largely unknown (DON 2019). Under certain environmental conditions, tungsten may dissolve and some forms of tungsten (depending on soil conditions) can move through soil (Dermatas et al. 2004). In the presence of alloying elements such as iron, nickel, and cobalt, tungsten was sorbed to clay soils and mobility was decreased; however, this sorption also depends on soil conditions such as pH and mineral and organic composition (Dermatas et al. 2004). Soils on Illeginni Islet are primarily well-drained and composed of calcareous sand poor in organic materials with a few carbonate fragments; therefore, residual tungsten is likely to mobilize into groundwater, as evidenced by the historical soil and groundwater testing results.

At KMISS, any C-HGB floating debris would be recovered and disposed of appropriately per the UES. The KMISS impact site is thousands of feet deep. Regardless of whether the C-HGB payload would remain intact or break apart upon impact, the payload would be expected to sink

to the bottom and remain undisturbed. There would be a temporary increase in turbidity from the debris reaching the substrate, but the effects would be short-lived. No site recovery at KMISS would be required or necessary.

Due to the historical soil sampling results for beryllium, tungsten, and uranium being less than the UES compliance goals; due to the planned recovery/cleanup operations for the Illeginni Islet planned impact site; due to the short-term impacts of increased turbidity at KMISS; and due to the future land use of Illeginni and KMISS as impact ranges; the impacts from the Proposed Action would reasonably be expected to be adverse short-term minor impacts.

4.2.2.5 Water Resources – Kwajalein Atoll

This section describes the environmental consequences of the proposed deep ocean impact site at KMISS as well as the Proposed Action at Illeginni Islet.

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Deep Offshore Waters

There are no groundwater or surface water resources within KMISS or surrounding waters that would be significantly impacted by the proposed CPS weapon system flight tests. Disturbance to ocean waters would be limited to the individual payload sinking thousands of feet to the ocean floor. No impacts would occur to water resources within KMISS from the CPS flight test.

Turbidity may be temporarily increased at the impact site. Some payload debris, including the heavy metals and other materials of which the payload is constructed, may be released into the ocean area. NASA conducted a thorough study of the seawater quality effects of missile components deposited in ocean waters in 1998 (DON 2017a). In 1998 NASA concluded that the release of hazardous materials from missiles into seawater would not be significant. The materials would be rapidly diluted and, except in the immediate vicinity of the debris, would not be found at concentrations that produce adverse effects. The payload materials are insoluble, and the depth of the Pacific Ocean is thousands of feet where light does not penetrate, levels of oxygen that might interact with materials at the surface are too low for that to occur, and water temperature differences from the upper water layers hamper any mixing between them. Any area on the ocean bottom affected by the slow dissolution of the payload debris would be relatively small, due to the size of the payload debris pieces as compared to the volume of surrounding seawater. Therefore, adverse water quality effects from the payload are expected to be minimal to insignificant. There are no plans to monitor deep water impacts in the KMISS area, where no mixing with upper layers of water occurs. Vessel operations would not involve intentional discharges of fuel, toxic wastes, or plastics or other solid wastes that could harm marine life. (USAG-KA 2022)

Illeginni Islet

The affected area for water resources is the same as described in **Section 4.2.2.4**, Geology and Soils. Illeginni Islet has no surface water; groundwater is very limited in quantity and is brackish and non-potable. Freshwater used to minimize fugitive dust following impact would not be allowed to flow to the lagoon or ocean and would evaporate in place. In the unlikely event of an accidental release of a hazardous material or petroleum product at the impact site, emergency

response personnel would comply with the UES Kwajalein Environmental Emergency Plan. Historical groundwater sampling at Illeginni Islet has showed little variation in values, with beryllium remaining undetected, tungsten exceeding residential tap water screening levels (**Table 3.2.5-1**), and uranium well below the USEPA maximum contaminant level for drinking water. Tungsten is one of the C-HGB structural materials for proposed flight tests.

After each flight test, any visible debris from the C-HGB impact on land would be recovered to the extent practicable. Post-test recovery operations on Illeginni Islet would require the manual cleanup and removal of any visible C-HGB debris, including hazardous materials. Excavated material would be screened, and the collected C-HGB debris washed before packaging for shipment back to Kwajalein Islet and the United States for appropriate disposal. When possible groundwater samples would be tested for concentrations of tungsten, beryllium, and uranium (as a surrogate for depleted uranium; USASMDC 2024, U.S. Air Force 2021). Both test personnel and USAG-KA personnel normally would be involved in these operations.

NASA conducted a thorough study of the seawater quality effects of missile components deposited in ocean waters and concluded that the release of hazardous materials from missiles into seawater would not be significant (U.S. Air Force 2021). The materials would be rapidly diluted and, except in the immediate vicinity of the debris, would not be found at concentrations that produce adverse effects (U.S. Air Force 2021).

The annual rainfall of approximately 100 inches would also contribute to dilution of any chemicals from the payload at the surface that may leach into the groundwater. Groundwater at Illeginni is currently considered non-potable and no impacts to potable water resources would be expected. Due to insolubility of beryllium and uranium there is no uptake of either element by vegetation, marine biota including fish, mollusks, shellfish, and sea mammals. If either material were even slightly soluble in sea water the soluble ions would rapidly mix with the world's oceans and be indistinguishable from the natural concentration (Robinson et al. 2005). See **Section 4.2.2.5** for a description of potential effects of tungsten on groundwater at Illeginni. Due to the planned recovery/cleanup operations for the Illeginni Islet planned impact site, the future land use of Illeginni and KMISS as impact ranges, and the short-term impacts of increased turbidity at KMISS, the impacts from the Proposed Action would reasonably be expected to be adverse short-term minor impacts.

4.2.2.6 Hazardous Materials and Waste Management – Kwajalein Atoll

Under the Proposed Action with CPS flight tests conducted at USAKA, no significant impacts on hazardous materials and waste management are expected at either KMISS or Illeginni Islet.

Other than the use of fuels and lubricants for operating transportation and other support equipment, there would be limited use of hazardous materials at USAKA in support of the CPS flight tests, whether the tests are conducted at KMISS or at Illeginni Islet. Hazardous waste must be disposed (shipped) off the island. The UES requires preparation and implementation of a contingency plan (the Kwajalein Environmental Emergency Plan), for responding to releases of oil, hazardous material, pollutants, and contaminants to the environment. Any accidental

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spills from support equipment operations would be contained and cleaned up in accordance with the Kwajalein Environmental Emergency Plan (USASMDC 2024). The use of lead-acid, lithium, or other batteries for support equipment would be temporary. Additionally, vessel operations would not involve intentional discharges of fuel or other wastes that could harm marine life.

A maximum of eight CPS payload (C-HGB) impacts could be scheduled each year for testing at KMISS. No hazardous material or waste issues would be associated with testing at KMISS, as all payload materials are expected to sink to the ocean floor with little potential for impact on marine life. Any visible floating debris observed after testing would be recovered after each flight test.

At Illeginni Islet, approximately one CPS payload impact per year may occur throughout the CPS flight test program's 10-year period. All flight tests would target the west end of the islet that includes the helipad (**Figure 2.1.4-3**). C-HGB impacts on other parts of the islet, in the adjacent reef, or in shallow waters are unlikely and would be unintentional. Similar missile impact testing at the islet has been previously analyzed in several environmental documents (U.S. Air Force 2004, U.S. Air Force 2010, U.S. Air Force 2021, USASMDC 2011, DON 2019). The payload impact would be comparable to those analyzed for Minuteman III and Flight Experiment-2 flight tests, which are used as bounding cases (RGNext 2020, U.S. Air Force 2004, DON 2019). Based on prior Minuteman III reentry vehicle and Flight Experiment-2 payload impacts, the C-HGB impact would form a crater approximately 20 to 30 ft in diameter and 7 to 10 ft deep (U.S. Air Force 2004, RGNext 2020).

Prior to post-test recovery and cleanup actions on Illeginni Islet, unexploded ordnance personnel would first survey the impact site. If necessary, materials would be collected for safe disposal. As described in **Section 4.2.2.4**, test support personnel entering the impact site would also implement precautionary procedures to control fugitive dust by wetting or washing down the impact area using freshwater. Any visible C-HGB debris found would be collected as much as practicable, including hazardous materials. Loose soil material excavated at the crater would be screened, and the collected C-HGB debris washed before packaging for shipment back to Kwajalein Island and the United States for study and appropriate disposal. Following removal of all support equipment and any remaining debris from the impact site, the crater would be backfilled and, if necessary, repairs made to any damaged structures.

Although unlikely, if a CPS payload were to strike the shallow waters or reef flats within 500 to 1,000 ft of the islet shoreline, recovery and cleanup operations would be conducted similarly to land operations when tide and water depths permit. A backhoe would be used to excavate the crater. Excavated material would be screened for payload debris, and the crater backfilled with coral and sediment ejected around the crater rim. Should the payload inadvertently impact in deeper waters on the ocean side of the islet or in the atoll lagoon, a dive team from USAG-KA would be brought in to conduct underwater search and recovery operations.

The C-HGB composition is primarily aluminum, steel, titanium, magnesium and other alloys, copper, fiberglass, chromate coated hardware, tungsten, plastic, Teflon, quartz, silicone, and

batteries (**Table 2.1.1-2**). For proposed testing at Illeginni Islet, the C-HGB would include either a conventional payload or a non-explosive mass simulator, and would include small pyrotechnic devices. The C-HGB, however, would not contain any propellants, beryllium, depleted uranium, or radioactive materials. For those heavy metals which may be contained in the C-HGB, the greatest quantity would likely be tungsten. For analysis purposes in this EA/OEA, it is assumed that up to 1,000 pounds of tungsten may be contained in the C-HGB. While the exact amount of tungsten that would be in the C-HGB cannot be presented in this EA/OEA, these analyses use this maximum amount to assess potential impacts, an approach similar to other recent DoD flight tests such as the Navy's Flight Experiment-2 (DON 2019).

At impact, the C-HGB would disintegrate into small fragments and fugitive dust. From the crater formed, ejected materials could be scattered up to 300 ft away. As described in **Section 3.2.6.2**, the soil in the Illeginni Islet target area that would be ejected may contain residual concentrations of beryllium, tungsten, and depleted uranium from prior intercontinental ballistic missiles and other missile flight tests (U.S. Air Force 2004, U.S. Air Force 2021, DON 2019). At USAKA, the compliance standards for heavy metals and other hazardous materials are set by the UES (USASMD 2024). According to UES Section 3-6.5.4(c)(5), for beryllium, USAG-KA will use an initial USEPA Regional Screening Level of 160 mg/kg for assessing the need for any cleanup. For depleted uranium, USAG-KA will use a derived screening level for insoluble uranium salts of 47 mg/kg for assessing the need for any cleanup. The UES does not specify a compliance standard for tungsten in soil. Therefore, per UES guidance, the USEPA Region IX Regional Screening Levels of 63 mg/kg for residential areas and 930 mg/kg for industrial areas are used. The regulatory limits and Illeginni Islet historical sampling results for beryllium, tungsten, and depleted uranium are summarized in **Table 3.2.4-1**.

Because the C-HGB would not contain any beryllium or depleted uranium, and because the observed soil concentrations of beryllium and depleted uranium from prior impact tests do not exceed the UES compliance standards, there is no need for soil cleanup operations at Illeginni Islet for those particular contaminants (RGNext 2020, U.S. Air Force 2020a, U.S. Air Force 2021). Comprehensive soil analyses have shown that concentrations of beryllium and uranium on Illeginni Islet are at the natural background concentrations found in soils on other coral atolls in the northern Marshall Islands and at other global locations (RGNext 2020, Robison et al. 2005, Robison et al. 2006, Robison et al. 2010, Robison et al. 2013).

It is assumed the C-HGB may contain up to 1,000 pounds of tungsten. Although tungsten was not detected in the most recent soil sample results (RGNext 2020) following other missile impact tests, soil sampling is recommended as a precaution following the first CPS flight test impact at Illeginni Islet. Depending on the sampling results would determine whether soil remediation efforts or further sampling for later flight testing is needed. With the reasonably foreseeable land use at Illeginni Islet as an active range and with the groundwater being not potable, further risk-based analysis and remediation planning is not required at this time. If in the future the land use designation changes, Illeginni Islet would be evaluated under the UES restoration requirements to determine if the new land use requires institutional controls or remediation. Therefore, impacts from implementation of the Proposed Action would be minor.

4.2.2.7 Environmental Justice – Kwajalein Atoll

Under the Proposed Action with CPS flight tests conducted at USAKA, no significant impacts on environmental justice are expected at either KMISS or Illeginni Islet. CPS activities at Kwajalein Atoll would be subject to requirements of the UES including project reviews by UES Appropriate Agencies and consultations where required. Any actions that have the potential to adversely affect environmental justice resources would require a Document of Environmental Protection, which would limit the potential for adverse impacts to environmental justice due to ongoing and future actions at Kwajalein Atoll. At Kwajalein Atoll, personnel conducting the CPS flight tests would reside only temporarily at USAG-KA. There are no permanent residents at Illeginni Islet.

The Navy has identified no human health, environmental, or other effects of the Proposed Action that would result in disproportionate or adverse effects on minority or low income-populations in the areas evaluated. Proposed activities would be conducted in a manner that would not exclude persons from participating, deny persons potential benefits, or subject persons to discrimination because of their race, color, national origin, or socioeconomic status. The Navy is providing opportunities for all members of the public to participate in the decision-making process and will fully consider public input provided as part of this process.

The Proposed Action may result in introduction of potentially hazardous materials into terrestrial and marine habitats as described in **Sections 4.2.2.4, 4.2.2.5, and 4.2.2.6**. Heavy metals have the potential to accumulate in sediments and benthic invertebrates and even fish have the potential to accumulate heavy metals (França et al. 2005). The potential for accumulation is metal specific and species specific, dependent on the feeding strategy of the wildlife, and in some cases on metal concentrations (Chen et al. 2016). It is not expected that proposed testing would result in hazardous material concentrations in the marine environment that would result in accumulation of these chemicals in wildlife, such as mollusks or fish, or that would significantly impact marine wildlife or human health. While the potential exists for hazardous materials resulting from flight tests to contaminate fish and impact subsistence fisheries, analyses in **Section 4.2.2.6** (Hazardous Materials and Waste Management) and **Section 4.2.2.3** (Biological Resources) indicate that hazardous materials and wastes would have negligible to minor impacts on the marine environment and fisheries species. While any additional contamination of fisheries resources could cause adverse effects on minority or low-income populations, proposed activities would have negligible (undetectable) adverse impacts on the environmental justice concern of subsistence fishing or related human health.

4.2.2.8 Health and Safety – Kwajalein Atoll

Under the Proposed Action for CPS flight tests at KMISS and at Illeginni Islet, no significant impacts on health and safety would be anticipated. As previously described, KMISS is a deep-water range just east of USAKA and Illeginni Islet is an uninhabited islet in the atoll. Both target areas fall within the RTS Mid-Atoll Corridor (**Figure 2.1.4-2**). The flight tests at USAKA would not introduce new types of activities or increase levels of risk to personnel or the public.

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Through the application of DoD and Army health and safety requirements identified in **Appendix B, Section B.8.2**, missile test programs are conducted with minimal risk to military personnel, contractors, and the general public. For the CPS flight tests, range safety representatives for the Navy and RTS would closely coordinate development of risk analyses based on the trajectories, probability for system failure, and the population density of any islands near missile flight paths. Should a flight abnormality occur, the Flight Termination System destruct package on the missile or payload would be activated to stop forward thrust and flight. Computer-monitored destruct lines, based on predetermined no-impact lines along flight paths, are preprogrammed to avoid any debris from falling onto inhabited areas consistent with range safety protocols and standard operating procedures. The RTS Range Safety Office would not allow a flight test to proceed if the calculated risk exceeds the Range Commanders Council 321-20 criteria, which requires that individuals within the general public not be exposed to a probability of casualty greater than 1 in 1,000,000 for any single mission (RCC 2020).

CPS missile flight paths towards USAKA would avoid overflight of RMI communities. Precautions within the Mid-Atoll Corridor impact area at USAKA may include evacuating nonessential personnel and sheltering all other personnel remaining within the corridor. As described in **Sections 2.1.5** and **3.2.8.2**, NTMs and NOTAMs would be issued prior to flight tests to warn mariners and pilots to avoid the selected impact area. Only mission-essential vessels would be allowed in the vicinity of the impact area. Radar sweeps by RTS land-based sensors and Navy sea-based sensors, and visual sweeps, would help to ensure that the impact area is clear of non-mission ships and aircraft prior to testing.

Following each flight test impact at Illeginni Islet, unexploded ordnance personnel would first clear the impact site for safe access. Test support personnel entering the impact site would wear proper personal protective equipment, as necessary. In addition, personnel would implement precautionary procedures to control fugitive dust by wetting or washing down the impact site.

4.3 Cumulative Effects

Cumulative effects analysis is an essential component of NEPA analysis, as it allows agencies and the public to understand how the incremental effects of a proposed action may contribute to cumulative environmental problems such as air pollution, water pollution, climate change, and biodiversity loss (86 FR 55757 [October 7, 2021]). This section (1) describes past, present, and reasonably foreseeable future actions relevant to cumulative effects; (2) analyzes the incremental environmental effects the Proposed Action may have in combination with other actions; and (3) evaluates cumulative effects potentially resulting from these interactions. A definition of cumulative effects, the regulatory setting for the cumulative effects analysis, and the scope of the cumulative effect analysis are detailed in **Appendix B, Section B.9**.

4.3.1 Past, Present, and Reasonably Foreseeable Actions

Past, present, and reasonably foreseeable future actions that have potential to interact with the Proposed Action in the affected environments of the Atlantic BOA, Pacific BOA, and Kwajalein Atoll are summarized in **Table 4.3.1-1**. Given the large geographic extent of proposed activities, several global routine and ongoing human activities also have the potential to interact with the Proposed Action such as commercial, recreational, and subsistence fishing; aquaculture; academic research; coastal land development and tourism; and commercial, recreational, and government vessel activity. These global routine human activities have cumulatively contributed to global trends that have the potential to interact with Proposed Action including climate change, increased noise, accumulated marine debris, and pollution.

Past actions in the geographic extent of the cumulative effects analysis have shaped the current environmental conditions in the affected environment as described in **Chapter 3.0**. While these past actions have shaped the existing conditions in the affected environment, these activities still have the potential to have additive or interactive effects when considered with the Proposed Action and are considered in the cumulative effects analysis.

4.3.2 Cumulative Effects Analysis

For the resource areas evaluated in detail in this EA/OEA, this section evaluates the potential for cumulative effects resulting from the Proposed Action in combination with other past, present, and reasonably foreseeable future actions. For most resources included in these analyses, quantifiable data are not available to evaluate the potential for cumulative effects, and a qualitative analysis approach was undertaken. In addition, for actions where an analysis of potential environmental effects for future actions has not been completed, assumptions were made regarding cumulative effects related to this EA/OEA where possible. The analytical methodology presented in **Appendix B, Section B.9** was used to determine cumulative effects.

Analyses in **Section 4.2** do not reveal any potentially significant environmental impacts of the Proposed Action when considered alone. While some of the past, present, and future actions considered (see **Section 4.3.1**) have had or would have significant environmental impacts, no substantial interactive or additive factors have been identified which would indicate that the Proposed Action would meaningfully contribute to cumulative effects when considered with these actions. Overall, the Proposed Action when considered with other actions would not result in significant cumulative effects.

Table 4.3.1-1. Past, Present, and Reasonably Foreseeable Actions Considered in Cumulative Effects Evaluation

Action	Proponent	Location	Timeframe	Description
Atlantic Fleet Training and Testing	Navy	Atlantic BOA	Past, Present, and Future	Military readiness training and testing activities in the Atlantic Fleet Training and Testing study area located along the east coast of North America and in the Atlantic Ocean. Includes training and testing activities at Navy pier-side locations, within port transit channels, near select civilian ports, and in bays, harbors, and waterways. These training and testing activities have been conducted by the Navy in the Atlantic BOA for decades and will continue in a similar manner into the foreseeable future. Activities include training with aircraft, vessels, and weapon systems, and the use of active sonar and explosives. (DON 2018a, DON 2009a, DON 2009b)
Hawaii-Southern California Training and Testing	Navy	Pacific BOA	Past, Present, and Future	Military readiness training and testing activities in the Hawaii-Southern California Training and Testing study area in the central and eastern North Pacific. These training and testing activities have occurred in the Pacific BOA for decades and will continue in a similar manner into the foreseeable future. Activities include aircraft and vessel operations, missile and munitions testing, and use of active sonar and explosives. (DON 2018b)
Northwest Training and Testing	Navy	Pacific BOA	Past, Present, and Future	Training and testing activities in the Northwest Training and Testing study area off the west coast of the United States, including offshore waters of the Pacific Ocean. Training and testing activities have occurred in this area for decades and will continue in a similar manner into the foreseeable future for the purpose of military readiness. Activities in the offshore area include aircraft and vessel operation, use of ordnance and munitions, and the use of sonar and explosives. (DON 2020b, DON 2015b)
Mariana Islands Training and Testing	Navy	Pacific BOA	Past, Present, and Future	Ongoing and future training and testing activities conducted at sea in the Mariana Islands Training and Testing study area to ensure military readiness. Activities include air, amphibious, anti-submarine, electronic, expeditionary, mine, strike, and surface warfare training and testing. Activities involve the use or operation of vessels, aircraft, munitions, sonar, and explosives. (DON 2020a, DON 2015a)
Point Mugu Sea Range Training and Testing	Navy	Pacific BOA	Past, Present, and Future	Continuing military readiness activities at Point Mugu Sea Range in a manner similar to the training and testing the Navy has conducted there for decades. Activities at the fully instrumented Sea Range include a wide range of weapon systems research, testing, and evaluation activities, including hypersonic vehicle test programs, as well as fleet training and testing. (DON 2022a, DON 2002)
Wallops Flight Facility Operations	NASA	Atlantic BOA	Past, Present, and Future	As part of site-wide operations at Wallops Flight Facility, activities include booster and payload splashdown and recovery in the Atlantic BOA as part of orbital and suborbital rocket operations. (NASA 2018, NASA 2009)

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Action	Proponent	Location	Timeframe	Description
Launch of NASA Routine Payloads	NASA	Atlantic BOA Pacific BOA Kwajalein Atoll	Past, Present, and Future	Launch of NASA routine payloads with expendable launch vehicles from launch facilities in Florida, California, Virginia, Alaska, and Kwajalein Atoll with flight and potential component splashdown in the Atlantic and Pacific Oceans. (NASA 2011)
SpaceX Falcon Launches	SpaceX and FAA	Atlantic BOA Pacific BOA	Past, Present, and Future	Launch and reentry of SpaceX vehicles from Florida and waterborne landing and recovery operations in the Atlantic and Pacific Oceans. (FAA 2020, FAA 2019)
Minuteman III Flight Testing	U.S. Air Force	Pacific BOA Kwajalein Atoll	Past, Present, and Future (through 2030)	Minuteman III intercontinental ballistic missile flight testing from Vandenberg Space Force Base, California to locations in the Pacific BOA and at Kwajalein Atoll. Past testing included reentry vehicle land impacts at Illeginni Islet. Current and future testing involves only deep-water terminal impact sites at Kwajalein Atoll and in the Pacific BOA. Involves booster splashdown and vessel activity in the Pacific BOA. (U.S. Air Force 2020a, U.S. Air Force 2013, U.S. Air Force 2004)
Missile Defense Systems Flight Tests	Missile Defense Agency	Pacific BOA	Past, Present, and Future (through 2027)	Ongoing intercept flight tests of missile defense systems in the Pacific including in the Gulf of Alaska. Activities in the Pacific BOA involve vessel operation, target and interceptor flight, and splashdown of intercept debris in the ocean. (MDA 2021)
Joint Flight Campaign	Navy and U.S. Army	Atlantic BOA Pacific BOA	Present and Future (through 2032)	Experimental flight tests for hypersonic weapons conducted from land-based launch sites in Hawaii, Virginia, California, and Florida with payload impact in the Pacific and Atlantic Oceans. BOA activities include booster splashdown, payload impact, and vessel activity. (DON and U.S. Army 2022)
Sentinel Flight Testing	U.S. Air Force	Pacific BOA Kwajalein Atoll	Future (2024-2030)	Implementation of the Sentinel Program (previously known as the Ground Based Strategic Deterrent Program), which is meant to replace the aging Minuteman III system, would require flight testing of the missile system. The test program would involve launches from Vandenberg Space Force Base; flight over, booster splashdown in, and reentry vehicle impact in the Pacific Ocean; and reentry vehicle impact at land or deep-water locations in Kwajalein Atoll. Up to nine flight tests per year would be conducted with a portion of these terminating at Kwajalein Atoll, including up to three total land impacts at Illeginni Islet. (U.S. Air Force 2021)
U.S. Space Force – Space Systems Command Flight Tests	U.S. Space Force	Pacific BOA	Present and Future	Two flight test demonstrations from Wake Island to a deep-water RTS site near Gagan Islet, Kwajalein Atoll. (USSF 2022)
KMISS Refurbishment	U.S. Army	Kwajalein Atoll (KMISS)	Past	Installation and maintenance of new cables and hydrophone sensors in the KMISS range at Kwajalein Atoll. (USASMDC 2014a)

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Action	Proponent	Location	Timeframe	Description
Advanced Hypersonic Weapon System Flight Testing	U.S. Army	Pacific BOA Kwajalein Atoll	Past	DoD testing of advanced hypersonic weapons for conventional prompt strike capabilities. Activities include splashdown of three vehicle stages in the Pacific BOA as well as payload impact on land at Illeginni Islet or in the deep ocean waters of Kwajalein Atoll. (USASMDC 2014b, USASMDC 2011)
Flight Experiment 1 and Flight Experiment 2	Navy	Pacific BOA Kwajalein Atoll	Past	Launch of a developmental payload from a land-based launch site at Kauai Test Facility at Pacific Missile Range Facility, Hawaii with payload impact at Illeginni Islet or deep-water impact zones within Kwajalein Atoll in the RMI. Activities in the Pacific BOA included vehicle overflight, booster splashdown, and vessel activity. (DON 2019, DON 2017a)
Air-Launched Rapid Response Weapon Flight Testing	U.S. Air Force	Pacific BOA Kwajalein Atoll (Illeginni Islet)	Past	Flight testing of a developmental air-launched weapon system with flight and booster splashdown in the Pacific BOA and payload impact at Illeginni Islet at Kwajalein Atoll. (U.S. Air Force 2020c)
Hypersonic Flight Test 3	U.S. Army	Pacific BOA Kwajalein Atoll	Past	Flight test of a launch vehicle and payload system launched from Kodiak Island, Alaska with flight and booster splashdown in the Pacific BOA and payload impact at deep-water or Illeginni Islet land impact sites at Kwajalein Atoll. (U.S. Army 2021)

Acronyms and Abbreviations: BOA = Broad Ocean Area, DoD = Department of Defense, FAA = Federal Aviation Administration, KMISS = Kwajalein Missile Impact Scoring System, NASA = National Aeronautics and Space Administration, RMI = Republic of the Marshall Islands, RTS = Ronald Reagan Ballistic Missile Defense Test Site, U.S. = United States

4.3.2.1 Broad Ocean Areas – Cumulative Effects

The Proposed Action has the potential to contribute incremental effects on the ocean ecosystem, which is already experiencing and absorbing a multitude of stressors to a variety of receptors. The aggregate impacts of past, present, and other reasonably foreseeable future actions (**Table 4.3.1-1**) have resulted in effects on global ecosystems throughout the study area; however, the decline of these resources is chiefly attributable to other stressors in the environment, (including the synergistic effect of bycatch, entanglement, vessel traffic, ocean pollution, coastal zone development, and global climate change).

In general, it is not anticipated that the implementation of the Proposed Action would have meaningful contribution to the ongoing stress or cause significant collapse of any particular marine resource, but it would further cause minute impacts on resources that are already experiencing various degrees of interference and degradation. It is intended that all existing standard operating procedures and the mitigation measures described in **Appendix C** would further reduce the potential impacts of the Proposed Action in such a way that they are avoided to the maximum extent practicable and to ensure that effects do not become cumulatively significant to any marine resource.

Air Quality–BOA

The estimated annual emissions for eight proposed flight tests per year over a 10-year period (80 total flight tests) would have an incremental additive contribution to cumulative effects on air quality for criteria pollutants and GHGs, when combined with other actions occurring in the layers of Earth's atmosphere (including the stratosphere and the upper atmosphere). Global rocket emissions impact the global atmosphere through stratospheric ozone depletion and deposition of particulates in the stratosphere (Ross and Vedda 2018). These global atmospheric impacts are likely to increase in the future as space traffic is projected to increase (Ross and Vedda 2018). While global rocket emissions are a minor contributor to overall human impacts on the atmosphere (Ross and Vedda 2018) actions such as the Proposed Action and other present and future actions will increase space launches/traffic over the Atlantic and the Pacific BOAs and will have cumulative effects on air quality. Overall, the Proposed Action, combined with the past, present, and future foreseeable actions, would result in minor incremental contributions to cumulative air quality effects in the Atlantic and Pacific BOAs.

Although GHG emissions would occur from the implementation of the Proposed Action, based on an estimate of GHG emissions for CPS flight test, the Proposed Action would result in minor incremental additive contributions to global GHG emissions and climate change. Overall, the Proposed Action combined with the past, present and future foreseeable actions would contribute to space traffic growth and potentially minor damage to the ozone layer/climate change. No cumulative effects of GHGs or climate change have been identified which would affect the implementation of the Proposed Action or its potential environmental impacts over the 10-year period of testing.

Biological Resources – BOA

Cumulative effects on biological resources in the Atlantic and Pacific BOAs have likely occurred due to past actions in the BOAs and will likely continue to occur in the foreseeable future. Past military training and testing in ranges throughout the BOAs may have impacted habitat quality and quantity in the area as well as biodiversity, population size, and distribution of many biological resources when taken in conjunction with other human activities. When considered alone, the Proposed Action would have negligible to moderate impacts on biological resources in the BOAs. No effects of the Proposed Action have been identified that would have interactive or meaningful additive effects on cumulative effects on biological resources. Based on the relatively small scale of proposed activities in the BOAs, the Proposed Action would have negligible to minor cumulative effects on biological resources.

Hazardous Materials and Waste Management – BOA

Cumulative effects on environmental quality resulting from hazardous materials and wastes have occurred due to past actions in the Atlantic and Pacific BOAs. As discussed in **Section 3.1.3**, pollution and marine debris from anthropogenic sources are widespread in the world's oceans and have been adversely impacting marine ecosystems and human health (Landrigan et al. 2020, NOAA 2023c). In general, there is less pollution and marine debris in deep offshore ocean areas than in nearshore coastal locations (Landrigan et al. 2020), but cumulative effects from past federal, state, public, and commercial activities have still occurred in the BOAs. When considered alone, the Proposed Action hazardous materials and wastes would have negligible to minor impact on environmental quality in the BOAs. Any contributions to cumulative effects in the BOAs would be negligible additive effects and no interactive effects have been identified. Based on the relatively small amount of potentially hazardous materials and wastes involved with proposed activities, the Proposed Action would have a negligible contribution to cumulative effects from hazardous materials and wastes in the BOAs and would not exceed any CERCLA reportable quality limit.

Health and Safety – BOA

The Proposed Action would be conducted using existing naval vessels and would operate in accordance with established Navy safety procedures to protect personnel and the public. Proposed activities would not have significant impact to health and safety and no substantial additive or interactive effects on health and safety have been identified.

4.3.2.2 Kwajalein Atoll – Cumulative Effects

The Proposed Action has the potential to contribute incremental effects on the environment at Kwajalein Atoll, which is already experiencing stressors to a variety of receptors resulting from past and ongoing military testing, commercial activities, and climate change. The aggregate impacts of past, present, and reasonably foreseeable future actions (**Table 4.3.1-1**) have resulted in environmental impacts at USAKA, specifically at Illeginni Islet; however, the decline of these resources may also be attributable to other stressors in the environment (including past and future land uses, and global climate change). In future years, it is anticipated that several DoD test programs listed in **Table 4.3.1-1** will conduct missile flight testing involving terminal

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impacts at RTS ocean and land locations at USAKA. It is anticipated that between 2024 and 2029, there may be up to 17 total flight tests per year with terminal impacts at RTS target sites (USASMDC 2023). Most of these tests would involve ocean payload impacts (including at KMISS), but a subset of these tests, up to six per year, may involve payload impact on land at Illeginni Islet (USASMDC 2023). Navy CPS up to eight flight tests per year would be a part of this total anticipated 17 DoD flight tests per year with terminal impacts at USAKA. Of the up to six total land impacts anticipated per year at Illeginni Islet, Navy CPS flight testing might comprise up to one per year.

In general, it is not anticipated that the implementation of the Proposed Action would have meaningful contribution to the ongoing stress or cause significant collapse of any particular resource, but it may further cause minute impacts on resources that are already experiencing various degrees of degradation. For all resource areas discussed in this section, requirements of the UES, including a Document of Environmental Protection, provide a protective mechanism to reduce the possibility that U.S. activities at USAKA would result in significant cumulative effects on the environment. The UES establishes a set of standards and procedures for all U.S. activities at Kwajalein Atoll and is updated every 2 years. It is intended that the Navy CPS Document of Environmental Protection (which would need to be renewed or modified after 5 years), other regulatory compliance with the UES, existing standard operating procedures, and the mitigation measures described in **Appendix C** would further reduce the potential impacts of the Proposed Action in such a way that they are avoided to the maximum extent practicable and to ensure that impacts do not become cumulatively significant to any resource area.

Climate Change – Kwajalein Atoll

Climate change is a notable concern in the RMI as the impacts of climate change are more pronounced in this island nation. The islets of Kwajalein Atoll are an average of 5.9 ft above sea level and have a total land area of just over 6 square miles. Climate change has the potential to have substantial impacts on terrestrial and marine ecosystems at Kwajalein Atoll, including the human environment, and may contribute to cumulative environmental effects. According to recent reports on by the International Panel on Climate Change, the factors projected to be of the most concern to the Pacific Islands before 2050 include mean air temperature, atmospheric CO₂ at the surface, ocean acidity, relative sea level, marine heatwaves, coastal flooding, coastal erosion, heavy precipitation and pluvial (rain) flood, and extreme heat (IPCC 2021). Trends in the RMI are consistent with global patterns of warming and sea level rise as detailed in **Section 3.2.1.2**.

Given the increasing rates of sea level rise and the low elevation of Kwajalein Atoll islets, it is possible that cumulative effects of GHG emissions and global climate change might adversely affect implementation of the Proposed Action by making the land-based target site unusable for payload impact and associated data collection. Based on the current rate of sea level rise and the estimated elevation of Illeginni Islet, it is not expected that sea level rise would affect implementation of the Proposed Action over the 10-year implementation period. It is also possible that cumulative effects related to climate change would affect the potential

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environmental consequences of the Proposed Action on environmental resource topics considered in this EA/OEA.

The potential cumulative effects of climate change in conjunction with proposed activities and other past, present, and reasonably foreseeable actions are considered in this section.

Air Quality – Kwajalein Atoll

It is anticipated that the emissions related to fugitive dust generated at payload impact at Illeginni Islet would be within UES air quality standards and below the significant indicator level.

GHG emissions for the CPS flight test activities within Kwajalein Atoll (Illeginni and KMISS) would have minor, if any, incremental contributions to global emissions of GHGs. It is anticipated that global atmospheric impacts of rocket emissions are likely to increase in the future as space traffic is projected to increase (Ross and Vedda 2018). This impact could include emissions from heating nitrogen oxides from the re-entry of rocket components (i.e. payloads and discarded rocket components). Research indicates that rocket launches would need to reach 100,000 launches for re-entry heating nitrogen oxides from component re-entry to cause a 0.5% decline in global stratospheric ozone (Ryan et al. 2022). As it relates to Proposed Action rocket emissions impact at Kwajalein Atoll, payloads entering Kwajalein Atoll would not carry propellant and would not release emissions. However, implementation of the Proposed Action in conjunction with other past, present, and reasonably foreseeable actions listed in **Table 4.3.1-1** could produce re-entry heating nitrogen oxides and subsequently result in a small, minor, additive contribution to global stratospheric ozone impacts.

Taken together with ongoing DoD test activities at Kwajalein Atoll (**Table 4.3.1-1**), Proposed Action impacts, including up to one payload land impact per year at Illeginni Islet and eight payload splashdowns at KMISS, would have a minor contribution to cumulative air quality (including potential impacts to the stratosphere and the upper atmosphere) effects at Kwajalein Atoll.

Cultural Resources – Kwajalein Atoll

The Proposed Action would not significantly impact cultural resources at Kwajalein Atoll and no interactive or additive effects have been identified which would contribute to cumulative effects on cultural resources.

Biological Resources – Kwajalein Atoll

Cumulative effects on biological resources at Kwajalein Atoll have likely occurred due to past military actions, commercial and subsistence fisheries, and the impacts of climate change. In addition to cumulative effects at Kwajalein Atoll, global effects of direct and indirect human effects on biological resources such as global trends in the loss of coral reef ecosystems and threats to marine animal populations may contribute to the relative significance of cumulative effects at USAKA. Taken as a whole, current available data do not allow for quantitative characterization of cumulative effects on nearshore and terrestrial biological resources at Illeginni Islet; therefore, cumulative effects were primarily evaluated using a qualitative

approach. Climate change-induced elevated water temperatures, altered oceanic chemistry, and rising sea level may be contributing to changes to coral reef ecosystems, and are likely beginning to affect corals and mollusks found at USAKA (NMFS and USFWS 2021). Climate change is a global phenomenon and widespread coral bleaching events have been recorded throughout the Tropical Pacific (Eakin et al. 2018), including multiple coral bleaching events that have occurred at USAKA between 2012 and 2018 (NMFS and USFWS 2021). NMFS has stated that coral bleaching events in the RMI are likely to increase in frequency because ocean waters are expected to reach severe coral bleaching temperatures annually within the next 20 years (NMFS and USFWS 2021).

Military testing will likely continue to occur at KMISS and Illeginni Islet in the foreseeable future; however, all future U.S. activities at USAKA and in Kwajalein Atoll would be subject to provisions of the UES including project reviews by UES Appropriate Agencies and consultations on protected resources where required. Any actions likely to adversely affect protected biological resources would require a Document of Environmental Protection which would limit the potential for cumulative effects to biological resources due to ongoing and future actions at Kwajalein Atoll. Furthermore, agreements under the UES require biennial monitoring of terrestrial and marine biological resources at USAKA islets which provides a protective mechanism to detect and respond to any realized cumulative effects. The proposed testing locations at USAKA have been used for similar DoD testing for decades with no evidence of cumulative effects to biological resources. There is evidence that past DoD and industrial activities at Kwajalein Atoll, when taken together, have had substantial adverse impacts on the levels of certain contaminants in lagoon reef fishes, including in Illeginni and Kwajalein harbors, and giant clams (APHC 2017). In recent years, the U.S. Army has implemented a number of measures to identify and reduce ongoing contamination impacts on reef and lagoon fishes, including halting the use of a number of chemicals, modification of activities such as sand blasting, and conducting several remediation projects to eliminate potential source contaminants (APHC 2017). While steps are being taken to identify and reduce or eliminate the sources of contaminants, it is likely that existing contamination within USAKA waters will continue to impact lagoon reef communities in the near future.

When considered alone, the Proposed Action would have negligible to moderate impacts on biological resources at Kwajalein Atoll. No effects of the Proposed Action have been identified that would have interactive or meaningful additive contribution to cumulative effects on biological resources. Based on the relative scale of proposed activities and the lack of observable cumulative effects from past DoD testing, the Proposed Action would have a negligible to minor contribution to cumulative effects on biological resources.

Geology and Soils – Kwajalein Atoll

Continued military testing at the land impact site on Illeginni Islet has the potential to result in cumulative effects on soils on the islet and in adjacent marine sediments. Testing of military payloads at Illeginni Islet has the potential to result in accumulations of heavy metals and other materials in the soil there. Because of this potential, all test programs utilizing Illeginni Islet (including Navy CPS) have a requirement for post-test or periodic soil sampling as part of

Document of Environmental Protection requirements. Past sampling has included requirements to test uranium, beryllium, and tungsten levels. After decades of DoD land impacts at Illeginni Islet, soil testing results have indicated that no potential contaminants exceed the reference levels specified in the UES and none of the measured levels are expected to pose human health or ecosystem risks. Because of testing requirements and standards set forth in the UES for response to any exceedance of reference levels cumulative effects on geology and soils are not expected. Taken alone, proposed activities would have minor short-term impacts to geology and soils at Illeginni Islet and would have negligible impact on the risk of cumulative effects.

Water Resources – Kwajalein Atoll

As with geology and soils, continued military testing at Illeginni Islet has the potential to result in cumulative effects on water quality on the islet and in adjacent marine waters. The continued use of military materials with tungsten components is one of the primary concerns with regards to cumulative effects at Illeginni Islet. While the details of potential effects of tungsten on environmental systems are not well understood, continued monitoring of groundwater tungsten levels at Illeginni Islet is planned after future DoD tests involving land impacts at Illeginni Islet (U.S. Air Force 2021). All programs conducting flight testing with impacts at Illeginni Islet (including Navy CPS) are required to conduct post-test or periodic water sampling as part of program Documents of Environmental Protection requirements. Taken alone, the Proposed Action is expected to have minor impacts on water resources. No interactive effects with those of past, present, or future actions have been identified but the proposed up to one land impact per year would be expected to have negligible to minor additive effects on cumulative effects on water resources at Illeginni Islet.

Hazardous Materials and Waste Management – Kwajalein Atoll

Taken together, past, present, and future actions at USAKA have likely resulted in cumulative hazardous materials and waste management impacts. Continued use of the KMISS range for DoD testing has the potential to result in accumulation of marine debris. Continued use of the land impact site at Illeginni Islet has the potential to result in deposition of heavy metals in the soils at the impact site. Accumulation of larger debris is not expected; however, it is possible that small quantities of heavy metals and other materials could accumulate at the site. As described in the geology and soils section, protective measures are in place due to requirements of the UES and all test programs are required to conduct soil and groundwater sampling after land impacts at Illeginni Islet. After decades of DoD testing at Illeginni Islet and KMISS, no significant accumulation of hazardous materials has been detected above the reportable quantity limit as listed in the UES, Table 3-6C (which is based on U.S. regulations). Continued soil and groundwater testing at Illeginni Islet and established response procedures for exceedance of levels specified in the UES substantially reduce the risk of cumulative hazardous materials impacts. Taken alone, the Proposed Action is not expected to result in exceedance of any screening levels for any materials contained in the CPS payload and there would be no significant impacts. Given the protective measures in place to prevent cumulative effects for hazardous materials and wastes at Kwajalein Atoll, no cumulative effects are anticipated.

Environmental Justice – Kwajalein Atoll

Cumulative effects on environmental justice resources at Kwajalein Atoll have likely occurred due to past military actions and commercial and subsistence fisheries. As discussed above for biological resources, there is evidence that past DoD and industrial activities at Kwajalein Atoll have had substantial adverse impacts on the levels of contaminants potentially hazardous to human health in food fishes (APHC 2017). While generally higher in industrial locations such as Kwajalein Harbor, contaminants such as PCBs, pesticides, and metals are found at locations across the southern half of Kwajalein Atoll (APHC 2017). The U.S. Army has implemented a number of measures to reduce ongoing contamination impacts on reef and lagoon fishes, including halting the use of a number of chemicals, modification of activities such as sand blasting, and conducting several remediation projects to eliminate potential source contaminants (APHC 2017). However, contaminant concentrations in lagoon reef food fish are high enough that they have adversely impacted recreational and subsistence fishing through implementation of several fishing closure areas in the atoll and may adversely affect public health, especially for Marshallese relying on subsistence fishing (APHC 2017). While steps are being taken to identify and reduce or eliminate the sources of contaminants and to implement fishing closures in contaminated areas, it is likely that existing contamination within USAKA waters will continue to impact fishing and has the potential to impact human health of subsistence fishers in the near future.

Military testing will continue at KMISS and Illeginni Islet; however, all future U.S. activities at USAKA and in Kwajalein Atoll would be subject to provisions of the UES including project reviews by UES Appropriate Agencies and consultations where required. Taken alone, the Proposed Action would not result in disproportionately high or adverse effects on human health or environment for minority or low income-populations. While the potential exists for negligible additive contributions to cumulative effects on subsistence fisheries, the Proposed Action would have negligible impacts (i.e., undetectable levels of effect) on cumulative effects to topics of environmental justice concern in the RMI.

Health and Safety – Kwajalein Atoll

All ongoing activities at KMISS and Illeginni Islet take place within an active U.S. Army testing range and are therefore conducted in accordance with applicable U.S. Army and other federal and state safety standards and requirements. The Proposed Action would not result in significant impacts to health and safety and would not result in any additive or interactive effects on health and safety that would contribute to cumulative effects.

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5.0 Other Considerations Required by NEPA

5.1 Consistency with Other Federal, State, and Local Laws, Plans, Policies, and Regulations

In accordance with 40 CFR § 1502.16(c), analysis of environmental consequences shall include discussion of possible conflicts between the Proposed Action and the objectives of federal, regional, state, and local land use plans, policies, and controls. **Table 5.1-1** identifies the principal federal and state laws and regulations that are applicable to the Proposed Action and indicates if the Proposed Action would be in compliance with these laws and regulations.

Table 5.1-1. Summary of Consistency with Other Laws, Plans, Policies, and Regulations for the Proposed Action

Applicable Laws, Executive Orders, Policies, and Guidance	Status of Compliance
Laws	
National Environmental Policy Act (NEPA) (42 U.S.C. § 4321 et seq.); Council on Environmental Quality NEPA implementing regulations (40 CFR §§ 1500-1508; Navy Procedures for Implementing NEPA (32 CFR § 775 and OPNAVINST 5090.1E)	This Environmental Assessment/Overseas Environmental Assessment (EA/OEA) has been prepared to meet requirements under NEPA and Navy implementing procedures. This EA/OEA presents the best available information to describe the human and physical environment and provides a full analysis of the potential environmental consequences of the Proposed Action and alternatives to support public involvement, informed decision making, and interagency coordination and consultation. The Navy is aware of the November 12, 2024 decision in <i>Marin Audubon Society v. Federal Aviation Administration</i> (FAA; <i>Marin Audubon Society v. FAA</i> 2024). To the extent that a court may conclude that the Council on Environmental Quality regulations implementing NEPA are not judicially enforceable or binding on this agency action, the Navy has nonetheless elected to follow those regulations at 40 CFR Parts 1500-1508, in addition to the Navy's procedures for implementing NEPA at 32 CFR Part 775, to meet the agency's obligations under NEPA.
Clean Air Act (42 U.S.C. § 7401 et seq.)	Conformity applies only to federal actions in nonattainment and maintenance areas. Before implementing any federal action in an air quality nonattainment or maintenance area, the Navy shall complete a General Conformity applicability analysis per 40 CFR § 93.154 to ensure the action does not interfere with a state's plan to attain and maintain the National Ambient Air Quality Standards (known as State Implementation Plans). In accordance with the Clean Air Act, Section 176(c), any action that negatively affects the implementation or goals of the State Implementation Plan is not allowed to proceed.
Clean Water Act (33 U.S.C. § 1251 et seq.)	The Navy has determined that proposed activities would not be a significant contributor of pollutants to waters of the United States, would not result in ocean discharges that may result in unreasonable degradation of the marine environment, and that no permitting under the Clean Water Act is required for the Proposed Action.
Coastal Zone Management Act (16 U.S.C. § 1451 et seq.)	The Navy has determined that the Proposed Action is consistent to the maximum extent practicable with the Coastal Zone Management Act. The proposed locations for Conventional Prompt Strike (CPS) activities do not contain any coastal zone resources as defined under the Coastal Zone Management Act of 1972.
National Historic Preservation Act (NHPA) (Section 106, 16 U.S.C. § 470 et seq.)	The Navy will comply with Section 106 of the NHPA for the land target site at U.S. Army Kwajalein Atoll (USAKA) as required and under the various regulatory conditions described in Appendix B, Section B.2.2 .

Applicable Laws, Executive Orders, Policies, and Guidance	Status of Compliance
Laws (Continued)	
Endangered Species Act (ESA) (16 U.S.C. § 1531 et seq.)	The Navy has complied with consultation requirements under Section 7 of the ESA for those locations and proposed activities which may affect species listed or proposed for listing, or critical habitats designated under the ESA as discussed in Appendix A, Section A.1.1 and biological resource sections of Chapter 4.0 .
Marine Mammal Protection Act (MMPA) (16 U.S.C. § 1361 et seq.)	The Navy has coordinated with the National Marine Fisheries Service (NMFS) regarding potential impacts to marine mammals and has complied with requirements of the MMPA. The Navy has determined that proposed activities would not result in the taking of marine mammals as defined under the MMPA (detailed in the biological resources sections of Chapter 4.0) and that no permitting under the MMPA is required.
Migratory Bird Treaty Act (16 U.S.C. § 703-712)	The Navy has determined that the Proposed Action would not result in the intentional take of migratory birds or incidental take of migratory birds which would result in a significant adverse effect on a population of migratory birds (detailed in the biological resource sections of Chapter 4.0). The Navy has coordinated with the U.S. Fish and Wildlife Service and is compliant with requirements of the Migratory Bird Treaty Act.
Magnuson-Stevens Fishery Conservation and Management Reauthorization Act (MSA) (16 U.S.C. § 1801 et seq.)	The Navy has determined that the Proposed Action would not significantly reduce the quantity or quality of any Essential Fish Habitat (EFH) or habitat areas of particular concern as detailed in the biological resource sections of Chapter 4.0 . The Proposed Action would have negligible adverse impacts on EFH in the Hawaiian Islands exclusive economic zone and the Navy consulted with the NMFS Pacific Islands Office on these potential effects.
American Antiquities Act (54 U.S.C. § 320301 et seq.)	The Navy's policies for cultural resources management address its responsibilities as a federal land manager under the American Antiquities Act. No additional regulatory compliance under the Antiquities Act is required for marine national monuments. The U.S. Armed Forces are exempt from marine national monument prohibitions and the Navy has concluded that the Proposed Action would not damage or destroy monument resources or result in any abandonment of materials within marine national monuments.
National Marine Sanctuaries Act (16 U.S.C. § 1431 et seq.)	The Navy has complied with requirements under the National Marine Sanctuaries Act and has determined that the Proposed Action would not injure sanctuary resources as detailed in Section 4.2.1.2 .
Marine Protection, Research and Sanctuaries Act (33 U.S.C. § 1401 et seq)	Through implementation of the Navy's Environmental Readiness Program (OPNAVINST 5090.1E), the Navy complies with all applicable federal and international laws and regulations pertaining to marine pollution, and the jettison or discharge of materials from ships and aircraft. The Proposed Action does not involve ocean dumping as defined under Marine Protection, Research and Sanctuaries Act Section 3(f) because the primary purpose of this federal activity would not be disposition of material and any depositing of debris or other materials into ocean waters would be incidental. Furthermore, as clarified by the U.S. Senate, if "material from missiles and debris from gun projectiles and bombs ultimately come to rest in the protected waters. Such activities are not covered by this Act" (Senate Report Number 92-451).
U.S. Public Law 108-188, Compact of Free Association Amendments Act of 2003	Under the Compact of Free Association, the United States and the Republic of the Marshall Islands (RMI) declared that NEPA was to be applied to all U.S. Government activities in the RMI and agreed to develop standards for environmental protection substantively similar to several U.S. environmental protection laws (e.g., Clean Water Act, ESA, and Clean Air Act). The USAKA Environmental Standards (UES; USASMDC 2024) serves as the environmental standards under the compact for all U.S. Government activities that occur on the U.S. Army Garrison Kwajalein Atoll/Ronald

Applicable Laws, Executive Orders, Policies, and Guidance	Status of Compliance
	Reagan Ballistic Missile Defense Test Site (USAG-KA/RTS) controlled islands and the mid-atoll corridor as well as all USAG-KA/RTS activities within the RMI. The Navy has prepared this EA/OEA to comply with the NEPA requirements in the compact as well as for compliance with some provisions of the UES. The Navy plans to comply with all requirements set forth in the UES before implementation of the Proposed Action.
Executive Orders (EOs)	
EO 12088, Federal Compliance with Pollution Control Standards	Through implementation of the Navy's Environmental Readiness Program (OPNAVINST 5090.1E), the Department of the Navy continues to comply with all applicable federal and international laws and regulations pertaining to pollution prevention and control at sea and on land.
EO 12114, Environmental Effects Abroad of Major Federal Actions	The Navy is compliant with EO 12114 and Department of Defense (DoD) implementing regulations which require federal agencies to evaluate the environmental consequences of federal actions outside the United States to facilitate informed decision-making. This EA/OEA serves as documentation of the need of and environmental effects of the Proposed Action.
EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-income Populations	The Navy is compliant with requirements of EO 12898 as described in Section 4.2.2.7 and Appendix B, Section B.7.2.1 . The Navy determined that proposed activities would not have a disproportionately high or adverse effect on minority or low income-populations.
EO 13045, Protection of Children from Environmental Health Risks and Safety Risks	The Navy determined that there would be no environmental health and safety risks that may disproportionately affect children and is compliant with EO 13045.
EO 13089, Coral Reef Protection	The Navy has complied with EO 13089 by identifying proposed activities that may affect U.S. coral reef ecosystems, has evaluated the effects of proposed activities on these ecosystems, and has determined that proposed activities would not substantially degrade the conditions of U.S. coral reef ecosystems, as discussed in the biological resource sections of Chapter 4.0 .
EO 13158, Marine Protected Areas	The Navy has complied with EO 13158 by identifying the marine protected areas that have the potential to be affected by the Proposed Action and evaluating potential effects to natural or cultural resources that are protected by each marine protected area. The Navy has measures in place to avoid harm to the natural and cultural resources that are protected by marine protected areas as detailed in Chapter 3.0, Chapter 4.0, and Appendix C .
EO 13840, Ocean Policy to Advance the Economic, Security, and Environmental Interests of the United States	The Navy would comply with requirements of EO 13840 as requested and required by the interagency Ocean Policy Committee established under this EO and has coordinated with other federal agencies on ocean related matters to the extent appropriate and consistent with national security interests and statutory requirements.
EO 13990, Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis	In compliance with EO 13990, the Navy used science to consider the reduction of greenhouse gas emissions, bolster resilience to the impacts of climate change, and prioritize environmental justice. The Navy has analyzed the potential for disproportionate and adverse human health and environmental effects (including risks) and hazards of activities on communities with environmental justice concern. The Navy is analyzing and tracking potential emission impacts of criteria pollutants and greenhouse gases in the United States and abroad. The Navy has measures in place to reduce emissions and build climate resilience and reduce climate threat.

Applicable Laws, Executive Orders, Policies, and Guidance	Status of Compliance
Executive Orders (Continued)	
EO 14008, Tackling the Climate Crisis at Home and Abroad	In compliance with EO 14008, the Navy has put the climate crisis as a focal point. In May 2022, the Navy released its Climate Action 2030 report, which is a comprehensive plan to both protect its equipment and personnel from the effects of climate change and to dramatically slash the department's annual emissions. The Navy is analyzing and tracking potential emission impacts of criteria pollutants and greenhouse gases in the United States and abroad. The Navy has measures in place to reduce emissions, build climate resilience, and reduce climate threat.
EO 14096, Revitalizing Our Nation's Commitment to Environmental Justice for All	In compliance with EO 14096, the Navy has analyzed the potential for disproportionate and adverse human health and environmental effects (including risks) and hazards of federal activities on communities with environmental justice concern of proposed activities. The Navy is providing opportunities for all members of the public to participate in the decision-making process and will fully consider public input provided as part of this process. In addition, Kwajalein Atoll would be subject to provisions of the UES including project reviews by UES Appropriate Agencies and consultations where required. Any actions that have the potential to adversely affect environmental justice resources would require a Document of Environmental Protection which would limit the potential for adverse impacts to environmental justice due to ongoing and future actions at Kwajalein Atoll.

Acronyms and Abbreviations: CFR = Code of Federal Regulations, OPNAVINST = Chief of Naval Operations Instruction, U.S.C. = United States Code

5.2 Relationship Between Short-Term Use of the Environment and Long-Term Productivity

NEPA requires an analysis of the relationship between a project's short-term impacts on the environment and the effects that these impacts may have on the maintenance and enhancement of the long-term productivity of the affected environment. Impacts that narrow the range of beneficial uses of the environment are of particular concern. This refers to the possibility that choosing one site reduces future flexibility in pursuing other options, or that using a parcel of land or other resources often eliminates the possibility of other uses at that site.

Operations related to the Navy CPS would not significantly impact the long-term natural resource productivity in any of the Proposed Action areas. The Proposed Action would not result in any impacts that would significantly reduce environmental productivity or permanently narrow the range of beneficial uses of the environment.

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Navy CPS Weapon System Flight Tests EA/OEA
7.0 List of Preparers

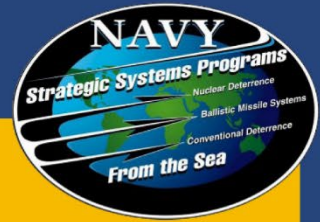
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Note: Cells with gray shading indicate no data was provided or available.

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Navy Conventional Prompt Strike Weapon System Flight Tests

Environmental Assessment/ Overseas Environmental Assessment

**Final
Volume 2: Appendices**

Department of the Navy

**January
2025**



Cover images: Illeginni Islet, Kristin Miller; Bigeyes in Kwajalein Lagoon, Kristin Miller; Hawksbill turtle in Kwajalein Lagoon, Kristin Miller; Steephead parrotfish in Kwajalein Lagoon, Kristin Miller

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Acronyms and Abbreviations

Acronym / Abbreviation	Definition
AUR	All-Up-Round
BOA	Broad Ocean Area
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
C-HGB	Common Hypersonic Glide Body
CO ₂	Carbon Dioxide
CO ₂ e	Carbon Dioxide Equivalent
CPS	Conventional Prompt Strike
dB	Decibel(s)
DoD	Department of Defense
DPS	Distinct Population Segment
EA	Environmental Assessment
EEZ	Exclusive Economic Zone
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
EO	Executive Order
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FONSH	Finding of No Significant Harm
FONSI	Finding of No Significant Impact
FR	Federal Register
ft	Foot/Feet
GBSD	Ground Based Strategic Deterrent (now Sentinel)
GHG	Greenhouse Gas
KMISS	Kwajalein Missile Impact Scoring System
mg/kg	Milligrams per Kilogram
MSA	Magnuson-Stevens Fishery Conservation and Management Reauthorization Act
NAAQS	National Ambient Air Quality Standards
NASA	National Aeronautics and Space Administration
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act

Acronym / Abbreviation	Definition
nm	Nautical Mile
NMFS	National Marine Fisheries Service
NOTAM	Notice to Air Mission
NRHP	National Register of Historic Places
NTM	Notice to Mariners
OEA	Overseas Environmental Assessment
OEIS	Overseas Environmental Impact Statement
OPAREA	Operating Area
OPNAV	Chief of Naval Operations
OPNAVINST	Chief of Naval Operations Instruction
PCB	Polychlorinated Biphenyl
pH	Potential of Hydrogen
PM _{2.5}	Particulate Matter Less Than or Equal to 2.5 Microns in Diameter
PM ₁₀	Particulate Matter Less Than or Equal to 10 Microns in Diameter
re	Referenced to
RMI	Republic of the Marshall Islands
ROI	Region of Influence
RTS	Ronald Reagan Ballistic Missile Defense Test Site
SINKEX	Sinking Exercise
UES	USAKA Environmental Standards
U.S.	United States
USAG-KA	United States Army Garrison – Kwajalein Atoll
USAKA	United States Army Kwajalein Atoll
USASMD	United States Army Space and Missile Defense Command
U.S.C.	United States Code
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
μPa	Micropascal

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A

Public and Agency
Involvement and
Distribution



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Appendix A. Public and Agency Involvement and Distribution

This section includes a summary of agency and public involvement and stakeholder outreach activities conducted by the Department of the Navy (Navy) during the development of the Navy Conventional Prompt Strike (CPS) Weapon System Flight Tests Environmental Assessment / Overseas Environmental Assessment (EA/OEA) and during the public review and comment period for the EA/OEA.

A.1. Agency Involvement and Distribution

A.1.1 Agency Coordination and Consultations

Interagency and intergovernmental coordination is an integral part of EA/OEA preparation. As part of early coordination and consultations, the Navy notified and consulted with relevant agencies on the Proposed Action to identify potential environmental issues and regulatory requirements associated with project implementation. A list of agencies contacted during development of the EA/OEA is included in **Section A.1.2**. Coordination and consultation correspondence with agencies with regards to the EA/OEA and the Proposed Action is included in **Appendix E**. The following discussions summarize the agency coordination and consultations that have been completed.

Consultations on Biological Resources

The Navy has evaluated the potential effects of the Proposed Action on biological resources under requirements of the relevant laws and regulations listed in **Section 5.1** in this EA/OEA. The Navy conducted coordination and consultation with the U.S. Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS), and U.S. Army Kwajalein Atoll (USAKA) Environmental Standards (UES) Appropriate Agencies (i.e., Republic of the Marshall Islands [RMI] Environmental Protection Authority, U.S. Army Corps of Engineers, U.S. Environmental Protection Agency [USEPA], NMFS, and USFWS) as described in this section.

U.S. Fish and Wildlife Service Coordination and Consultation. Pursuant to requirements of the Endangered Species Act (ESA), the Navy has evaluated the potential effects of the Proposed Action on ESA listed species, candidate species, and designated critical habitats under the jurisdiction of USFWS. The Navy has concluded that proposed CPS activities have no effects on ESA-listed seabird species in the Broad Ocean Area (BOA) and that no consultation with the USFWS under Section 7 of the ESA is required for these activities. The Navy coordinated with the USFWS regarding these conclusions with submission of the Draft EA/OEA to appropriate USFWS regional offices.

Pursuant to provisions of the Migratory Bird Treaty Act, the Navy has evaluated the effects of the Proposed Action on migratory birds, including birds of conservation concern, in this

EA/OEA. The Navy coordinated with the USFWS on potential effects to migratory birds with submission of the Draft EA/OEA to appropriate USFWS regional offices.

National Marine Fisheries Service Coordination and Consultation. Pursuant to requirements of the ESA, the Navy has evaluated the potential effects of the Proposed Action on ESA listed species, candidate species, and designated critical habitats in a CPS Marine Biological Evaluation (DON and USASMDC 2024). The Navy has concluded that proposed CPS activities may affect ESA-listed species of marine mammals, sea turtles, and fish and may affect designated critical habitat. The Navy consulted with NMFS under Section 7 of the ESA and NMFS concurred with the Navy's conclusion that the Proposed Action may affect but is not likely to adversely affect ESA-listed marine mammals, sea turtles, or fish in the BOA (NMFS 2024b).

Pursuant to provisions of the Marine Mammal Protection Act and the Magnuson-Stevens Fishery Conservation and Management Reauthorization Act (MSA), the Navy evaluated the effects of the Proposed Action on all marine mammals and on Essential Fish Habitat (EFH). The Navy determined that proposed activities would not result in take of marine mammal species and determined that the Proposed Action would not significantly reduce the quality and/or quantity of EFH in the Region of Influence (ROI). The Navy has coordinated with NMFS on the relevant analyses and conclusions with submission of the Draft EA/OEA to appropriate NMFS regional offices and has consulted with the Pacific Islands Regional Office on potential negligible effects to EFH in the Hawaiian Islands EEZ (see **Appendix E, Sections E.2.9** through **E.2.12**).

UES Appropriate Agencies Coordination and Consultation. Pursuant to requirements of the UES, the Navy has evaluated the effects of the Proposed Action on species and habitats listed as coordination or consultation resources under the UES. The Navy has concluded that proposed activities at USAKA may affect coordination species and habitats but that those activities would not have significant effects on those resources. The Navy has notified the USFWS, NMFS, and the RMI Environmental Protection Authority, as UES Appropriate Agencies, of the conclusions of their preliminary review under Section 3-4.6.3 of the UES with submission of the Draft EA/OEA (see **Appendix E, Sections E.3** and **E.2.2**).

The Navy has evaluated the effects of the Proposed Action on species listed as consultation species under the UES in this EA/OEA in the CPS Biological Assessment for Kwajalein Atoll Activities (DON and USASMDC 2023). The Navy has concluded that proposed activities at USAKA may affect UES consultation species and initiated consultation with USFWS and NMFS under Section 3-4.5.3 of the UES on December 8, 2023 (**Appendix E**). The USFWS issued a letter of concurrence with Navy conclusions on March 5, 2024 (**Appendix E, Section E.2.4**) and NMFS issued a biological opinion in November 2024 (NMFS 2024b).

A.1.2 Agencies Contacted

A list of agencies contacted or consulted during development of the EA/OEA is included in **Table A.1.2-1**.

Table A.1.2-1. Agencies Contacted or Consulted During EA/OEA Development

United States Federal Agencies
National Oceanic and Atmospheric Administration National Marine Fisheries Service Office of Habitat Conservation, Habitat Protection Division Office of Protected Resources, Interagency Cooperation Division Pacific Islands Regional Office, Habitat Conservation Division Pacific Islands Regional Office, Protected Resources Division Office of National Marine Sanctuaries U.S. Army U.S. Army Corps of Engineers, Honolulu District, Environmental Programs Branch U.S. Army Garrison – Kwajalein Atoll Environmental Division Directorate of Public Works U.S. Environmental Protection Agency Office of Enforcement and Compliance Assurance, Office of Federal Activities, NEPA Compliance Division Region 9, Environmental Review Branch, Tribal, Interagency, and Policy Division Region 9, Freely Associated States Circuit Rider Region 10, Policy and Environmental Review Branch U.S. Fish and Wildlife Service Ecological Services Pacific Islands Fish and Wildlife Office
Republic of the Marshall Islands Agencies
Environmental Protection Authority

Acronyms and Abbreviations: NEPA = National Environmental Policy Act, U.S. = United States

A.2. Public Involvement and Distribution


A.2.1 Public Distribution and Repositories

The Notice of Availability for this Draft EA/OEA and Draft Finding of No Significant Impact (FONSI) / Finding of No Significant Harm (FONSH) was published in local and regional newspapers for locations associated with the Proposed Action (see **Table A.2.1-1**) between May 31 and June 3, 2024. An example of the newspaper advertisement is shown in **Figure A.2.1-1**. The Notice of Availability was also distributed to the agencies listed in **Table A.2.1-2** in the form of a letter (see **Appendix E, Section E.1.2**).


Copies of the Draft EA/OEA and Draft FONSI/FONSH were placed in local repositories (**Table A.2.1-3**) for public access and also made available over the Internet at <https://www.nepa.navy.mil/CPSSea-Based>. Those agencies, organizations, and repositories that were directly notified about the Notice of Availability or received a copy of the document are listed in **Table A.2.1-2** and **Table A.2.1-3**.

Table A.2.1-1. Newspaper Publications for the Notice of Availability

Location	Newspaper
Norfolk, Virginia	The Virginia Pilot
Jacksonville, Florida	Florida Times Union
Brevard, Florida	Florida Today
San Diego, California	The San Diego Union-Tribune
Ventura County, California	Ventura County Star
Kitsap, Washington	The Kitsap Sun
Seattle, Washington	The Seattle Times
Anchorage, Alaska	Anchorage Daily News
Honolulu, Hawai'i	Honolulu Star-Advertiser
Kwajalein Atoll, Republic of the Marshall Islands	Kwajalein Hourglass
	The Marshall Islands Journal



The Department of the Navy
INVITES YOU TO PARTICIPATE
in the Public Involvement Process for the
Navy Conventional Prompt Strike Weapon System Flight Tests EA/OEA



The U.S. Department of the Navy (Navy) has prepared a Draft Environmental Assessment/Overseas Environmental Assessment (EA/OEA) to evaluate the potential environmental impacts of conducting missile flight tests in both Atlantic and Pacific Ocean regions. Testing would involve flight tests from sea-based launch locations, vehicle flight over the ocean, splashdown of boosters in the ocean, and payload impact either in broad ocean areas or on land at a U.S. Army test site at Kwajalein Atoll in the Republic of the Marshall Islands.

Public Involvement Opportunity

The Navy welcomes your review and comments on the Draft EA/OEA. Comments may be submitted online at <https://www.nepa.navy.mil/CPSSea-Based> or by mail to:

Environmental Program Manager/SP2521
Strategic Systems Programs
1250 10th Street SE, Bldg. 200, Suite 3600
Washington Navy Yard, DC 20374-5127

All comments must be submitted online or postmarked by July 3, 2024.

The Draft EA/OEA is available online at <https://www.nepa.navy.mil/CPSSea-Based> or at the following public libraries: Norfolk's Slover Memorial Main Library, Virginia; Cape Canaveral Public Library, Florida; Jacksonville Public Library, Florida; City of San Diego Central Library, California; Oxnard Downtown Main Library, California; Kitsap Regional Library-Poulsbo, Washington; Seattle Public Central Library, Washington; Anchorage Public Library, Alaska; Hawai'i State Library-Honolulu; Kwajalein Island's Grace Sherwood Library and Roi-Namur Library, Republic of the Marshall Islands.

Figure A.2.1-1. Example Newspaper Announcement of the Notice of Availability of the Draft EA/OEA

Table A.2.1-2. Entities that Received the Draft EA/OEA Notice of Availability Letter

United States Elected Officials
United States Senators Alaska California Connecticut Georgia Hawaii Virginia Washington United States Representatives Alaska California Districts 52 and 26 Connecticut District 2 Florida Districts 4 and 8 Georgia District 1 Hawaii District 1 Virginia Districts 1 and 3 Washington Districts 1, 6, 7, and 9
United States Federal Agencies
Advisory Council on Historic Preservation Office of Federal Agency Programs Council on Environmental Quality Department of State Bureau of Oceans and International Environmental and Scientific Affairs Department of Transportation Federal Aviation Administration Marine Mammal Commission National Marine Protected Areas Center National Oceanic and Atmospheric Administration National Marine Fisheries Service Office of Habitat Conservation, Habitat Protection Division Office of Protected Resources, Interagency Cooperation Division Pacific Island Regional Office, Habitat Conservation Division Pacific Islands Regional Office, Protected Resources Division Office of National Marine Sanctuaries U.S. Army U.S. Army Corps of Engineers, Honolulu District, Environmental Programs Branch U.S. Army Garrison – Kwajalein Atoll Environmental Division Directorate of Public Works U.S. Department of the Interior Office of Environmental Policy and Compliance, Environmental Coordination Division

United States Federal Agencies (continued)
U.S. Coast Guard Office of Environmental Management District 14 U.S. Environmental Protection Agency Region 1, Office of Environmental Review Region 2, Environmental Review Section Region 3, Office of Communities, Tribes, and Environmental Assessment Region 4, NEPA Program Office Region 9, Environmental Review Branch, Tribal, Interagency, and Policy Division Region 9, Freely Associated States Circuit Rider Region 10, Policy and Environmental Review Branch U.S. Fish and Wildlife Service Ecological Services Pacific Islands Fish and Wildlife Office
Republic of the Marshall Islands Agencies
Environmental Protection Authority Majuro Ebeye

Acronyms and Abbreviations: NEPA = National Environmental Policy Act, U.S. = United States

Table A.2.1-3. Repositories that Received Copies of the Draft EA/OEA and Draft FONSI/FONSH

Repository Name	Address
Anchorage Public Library, Z. J. Loussac Library	3600 Denali Street, Anchorage, AK 99503
Cape Canaveral Public Library	201 Polk Avenue, Cape Canaveral, FL 32920
City of San Diego Central Library	330 Park Boulevard, San Diego, CA 92101
Grace Sherwood Library	Kwajalein Island, Republic of the Marshall Islands
Hawaii State Library	478 South King Street, Honolulu, HI 96813
Jacksonville Public Library	303 North Laura Street, Jacksonville, FL 32202
Kitsap Regional Library	700 Northeast Lincoln Road, Poulsbo, WA 98370
Oxnard Downtown Main Library	251 S. A Street, Oxnard, CA 93030
Roi-Namur Library	Roi-Namur, Republic of the Marshall Islands
Seattle Public Library	1000 Fourth Avenue, Seattle, WA 98104
Slover Memorial Main Library	235 East Plume Street, Norfolk, VA 23510

Comments on the Draft EA/OEA and Draft FONSI/FONSH were accepted over the 30-day public review period from June 3 through July 3, 2024, as specified in the Notice of Availability. Written comments could be submitted using either of these two ways: (1) via the Internet at <https://www.nepa.navy.mil/CPSSea-Based> or (2) mailed to the following address:

Environmental Program Manager/SP2521
Strategic Systems Programs
1250 10th Street SE, Bldg. 200, Suite 3600
Washington Navy Yard, DC 20374-5127

Following the 30-day public review period and consideration of public and agency comments, the Navy decided to finalize the EA/OEA and sign the FONSI/FONSH, which would allow the proposed CPS flight tests to proceed, and that preparation of an Environmental Impact Statement / Overseas Environmental Impact Statement (EIS/OEIS) was not required. The Navy considered all public and agency comments received during development of the Final EA/OEA and FONSI/FONSH. The Final EA/OEA and FONSI/FONSH are accessible via the internet at <https://www.nepa.navy.mil/CPSSea-Based>.

A.2.2 Comments Received on the Draft EA/OEA and Draft FONSI/FONSH

Public and agency comments received during the public comment period and considered during development of the Final EA/OEA and FONSI/FONSH are listed in **Table A.2.2-1**. Comments were received from the USEPA and from one individual member of the public. Comments from individual members of the public were designated by a code (to protect personally identifiable information) corresponding to the commenter's first and last initial and the comment number from that individual.

The Draft EA/OEA was also distributed to UES Appropriate Agencies (RMI Environmental Protection Authority, NMFS Pacific Islands Regional Office, USFWS Pacific Islands Office, U.S. Army Corps of Engineers Honolulu District, and USEPA Region 9) as part of the Notice of Proposed Activity required under the UES. Environmental comments and recommendations received from agencies during the Notice of Proposed Activity review period (June 3 to September 3, 2024) were also considered during development of the Final EA/OEA and FONSI/FONSH and are listed in **Table A.2.2-2**. The NMFS Pacific Islands Regional Office submitted comments and recommendations during the Notice of Proposed Activity agency review period.

Table A.2.2-1. Comments Received on the Draft EA/OEA during the Public Comment Period

Comment Number	Comment	Navy and USASMDC Responses
United States Federal Agency Comments		
United States Environmental Protection Agency (USEPA), Region 9		
EPA-01	<p>Streamlining Environmental Review Processes</p> <p>Since 2019, the EPA has expressed concerns regarding the insufficient and fragmented approach of DoD's impact assessments under NEPA for its missile testing actions that impact Illeginni Islet, lagoon, and offshore waters at the United States Army Kwajalein Atoll's (USAKA) Ronald Reagan Ballistic Missile Defense Test Site. Separate environmental assessments analyzing the individual testing actions have not fully captured the cumulative impacts that DoD agency missile tests have on the shared target site at Illeginni Islet. We have repeatedly recommended a programmatic NEPA document be prepared, in order to remedy this fragmentation.</p> <p>According to the response to comments, the USASMDC is currently planning to evaluate the range of mission flight test activities at USAKA in a programmatic context; however, we recently learned that the programmatic effort would occur not under NEPA, but rather as a Document of Environmental Protection (DEP), pursuant to the Environmental Standards and Procedures for U.S. Army Kwajalein Atoll Activities (UES) in the Republic of the Marshall Islands (RMI). The EPA believes this is a missed opportunity to streamline both the UES and NEPA processes, and we continue to recommend that a programmatic NEPA document be prepared. The Council on Environmental Quality NEPA regulations direct Federal agencies to integrate the requirements of NEPA with other planning "to the fullest extent possible" (40 CFR 1502.24(a)). Nevertheless, we appreciate that a programmatic DEP will be prepared, and continue to be available to assist in early review and input as needed. We would appreciate receiving schedule information for that effort. We note that while not intended for NEPA compliance, the comprehensive information in the programmatic DEP may still inform the cumulative impacts analyses in the multiple individual flight test EAs.</p>	<p>Thank you for expressing your concerns regarding streamlining of the environmental review process for DoD testing actions at USAKA. As one of many DoD programs utilizing USAKA for flight test activities, Navy SSP would not be the proponent agency evaluating Ronald Reagan Ballistic Missile Defense Test Site (RTS) program activities; therefore, this programmatic analysis is not addressed in the Navy CPS EA/OEA.</p> <p>As a cooperating agency, USASMDC responds that USASMDC is currently evaluating the environmental impacts of the full range of RTS mission flight test activities in accordance with requirements of the UES. USASMDC notes the USEPA's comment regarding streamlining of the NEPA process as well. USASMDC will continue to coordinate with the USEPA throughout the RTS mission activities programmatic environmental analysis process.</p>
EPA-02	<p>Environmental Justice - Fish Contamination</p> <p>DoD acknowledges that fisheries are an important economic and cultural aspect of the RMI community, and that "cumulative effects on environmental justice resources at Kwajalein Atoll have likely occurred due to past military actions" (p. 41). While the Final Southern U.S. Army Garrison – Kwajalein Atoll Fish Study conducted by the U.S. Army Public Health Center in 20172 revealed that fish were contaminated with several pollutants, tungsten was not tested and the Draft EA response to comments indicates that the potential effects of residual tungsten on biotic communities is largely unknown. Given this information, the EPA recommends an additional fish study to determine whether tungsten or additional pollutants are present in fish whose consumption could be a pathway of exposure for local communities. We also recommend</p>	<p>The Navy appreciates the USEPA's concerns associated with fish contamination at USAKA. The Navy has determined that while Navy CPS activities result in negligible to minor contributions to contaminants at Kwajalein Atoll, these contributions to baseline and cumulative fish contamination levels would be undetectable and insignificant. Therefore, the Navy has determined that no CPS program-specific fish studies would be conducted.</p> <p>USASMDC notes the USEPA's recommendation for additional fish studies to test for the presence of tungsten and other previously untested pollutants in fish tissues.</p>

Comment Number	Comment	Navy and USASMDC Responses
	localized communication methods regarding best practices and safe fish consumption, as described in the next section.	
EPA-03	<p>Environmental Justice - Community Engagement and Outreach Strategy</p> <p>Executive Order 14096, Revitalizing Our Nation's Commitment to Environmental Justice for All (April 21, 2023), directs Federal agencies to provide opportunities for early and meaningful involvement in the environmental review process for communities with environmental justice concerns potentially affected by a proposed action (E.O. 14096, Section 3(a)(ix)(C)). Therefore, we highlight the importance of localized public outreach. We recommend conducting focused community engagement, which could include educational efforts with local fishing groups, ensuring public information is translated as necessary, and including information on cooking techniques to reduce exposure to contaminants.</p>	<p>The Navy has provided opportunities for involvement in the Navy CPS environmental review process through Draft EA/OEA notices of availability published in local newspapers and sent to interested stakeholders with details regarding multiple ways to submit comments. The Navy also plans to publish and send notices of availability of the Draft DEP when it is available. All newspaper notices in the RMI are published in both English and Marshallese. Copies of environmental documents are made available online and in local libraries. Based on the potential impacts of the Proposed Navy CPS Action, the Navy has determined that no additional outreach specifically regarding fish contamination at USAKA is warranted for this program.</p> <p>USASMDC notes the USEPA's recommendation for additional community engagement regarding existing fish contamination at USAKA and is willing to discuss this issue further with USEPA, in conjunction with the United States Army Garrison – Kwajalein Atoll (USAG-KA), in the future.</p>
EPA-04	<p>Stratospheric Ozone Depletion</p> <p>We appreciate the information in the public DEA highlighting our comment regarding stratospheric ozone depletion. The additional information explains how global rocket emissions cause ozone depletion and deposit particulates in the stratosphere and that these global atmospheric impacts are likely to increase in the future as space traffic is projected to increase, resulting in cumulative effects (p. 4-35). We suggest that future flight test impact assessments discuss these impacts for all aspects of the project, not just under the impacts to broad ocean areas since they occur with all flights regardless of target location, and that the authors consider adding a heading (such as "impacts to stratospheric ozone") that distinguishes this discussion from the discussion of ground-level air quality impacts. While a small number of flight tests are evaluated in each impact assessment, a practice which lends credence to individual less-than-significant impact conclusions, it is important to try to capture the collective impacts from all the flight tests being planned, some of which are identified in Table 4.3.1-1 - Past, Present, and Reasonably Foreseeable Actions.</p> <p>The latest scientific assessment of ozone depletion considers future scenarios of space industry emissions, including the potential for a significant increase in launch rates. Some studies suggest that with a weekly launch frequency, which will be exceeded at Vandenberg Space Force Base alone, rockets could be responsible for stratospheric ozone loss to an extent that researchers have identified as being of concern. We note that the solid fuel propellant used for these missile</p>	<p>The Navy has added additional discussion of the potential stratospheric ozone depletion effects of the Proposed Action in a cumulative context, especially as it relates to proposed activities at Kwajalein Atoll, to the Final EA/OEA. The Navy has considered the latest scientific assessments recommended by the USEPA in preparation of the Final EA/OEA with consideration of the guidance provided by 40 CFR 1502.21 for incomplete or unavailable information.</p>

Navy CPS Weapon System Flight Tests EA/OEA
Appendix A – Public and Agency Involvement and Distribution

Comment Number	Comment	Navy and USASMDC Responses
	<p>launches has a much larger impact on stratospheric ozone than rockets used in commercial space launches. We recommend the Final EA discuss stratospheric ozone depletion effects of the proposed action in the cumulative context, utilizing the guidance provided in 40 CFR 1502.21 for incomplete or unavailable information.</p>	
Public Comments from Individuals		
DW-01	<p>Ladies/Gentlemen,</p> <p>Reference is made to the public solicitation for comments on a Draft Environmental Assessment/Overseas Environmental Assessment (DEA/OEA) concerning missile flight tests in both Atlantic and Pacific Ocean regions.</p> <p>Please accept my strong endorsement for continued US Navy flight testing in both regions, consistent with national defense requirements. As a former Commanding Officer, Pacific Missile Range Facility, Barking Sands, Kauai, and former federal agent who routinely visited Kwajalein and other Pacific DoD facilities used in support of Research, Development, Test & Evaluation events, I strongly support continued use of these ranges – there is no substitute.</p> <p>Please understand I have no personal or financial interest in this EIS. That said, given my professional knowledge of the test facilities and operations, I believe these ranges should continue to be used.</p> <p>In my experience, these tests are invaluable, both in the RDT&E sense, and to validate legacy weapon systems, to ensure they are still viable.</p> <p>Events are conducted with strict environmental and safety protocols, and timed to preclude interference with commercial aviation and shipping.</p> <p>Advisories via Notice to Airmen and Notice to Mariners ensure the widest possible alerts are disseminated. In my memory, there have been no instances where flight tests resulted in damage/injury to the general public. However, there have been instances where flight test(s) were cancelled/postponed at a significant cost, because the range was “fouled” by mariners.</p> <p>These tests involve distances so vast they cannot be conducted over land-based ranges. In addition, range support craft are prepositioned to monitor the tests and once completed, return to their home ports. There are no permanent structures affixed to the ocean surface or floor that would subsequently interfere with routine, commercial shipping traffic.</p> <p>While I no longer speak for the US Navy, nor any other federal, state, or local government, I strongly believe and support the use of these ranges for national defense-related testing that cannot be accomplished by any other means. It is noted other nations use open-ocean testing as well, for the same reasons.</p> <p>Strongly recommend continued use of these ranges for the reasons stated.</p>	<p>Thank you for your participation in the National Environmental Policy Act process. The Navy appreciates your support for proposed Navy CPS flight tests in both the Pacific and Atlantic Ocean regions.</p>

Table A.2.2-2. Comments and Recommendations Received during the Notice of Proposed Activity UES Agency Review Period

Comment Number	Comment	USASMDC and Navy Responses
United States Federal Agency Comments		
National Marine Fisheries Service (NMFS) Pacific Islands Regional Office		
NMFS-01	<p>Comments</p> <p>This submission includes the Navy CPS Weapon System Flight Tests Draft Environmental Assessment (EA) / Overseas Environmental Assessment (OEA) and the Navy CPS Weapon System Flight Tests Biological Assessment for Activities at Kwajalein Atoll. These EAs include requirements set by the UES.</p> <p>This assessment describes approximately 80 missile test flights. Each test will drop waste in open ocean environments and terminate in the ocean or at Illeginni Islet. Direct environmental impacts of any individual described flight test are expected to be minor, however, minor additive impacts by many cumulative actions over multiple decades have the potential to result in significant environmental degradation and impacts to people through cumulative environmental impacts. These include potential impacts to habitats and humans via contaminated seafoods. Our recent environmental reviews of similar weapons testing activities have expressed these concerns.</p> <p>The ongoing global loss of coral reef ecosystems, including the multitude of protected species that make them up, is a result of cumulative impacts from a variety of direct and indirect human influences. Therefore, the additional physical and chemical disturbances arising from weapons testing at any scale creates direct and indirect impacts that should be mitigated or avoided to the best extent possible.</p> <p>Terminal payload impacts at Illeginni will disperse debris, dust, and volatilized contaminants. Debris and ejecta could directly impact biological resources in an area up to a 300 ft radius from the point of impact. Fugitive dust caused by impact would be redistributed to waters adjacent to (most likely westward/downwind of) the site. Contaminants could settle in nearshore ecosystems. Any soil and water contamination on Illeginni could be deposited in the nearshore environment via groundwater seeps, saltwater/groundwater mixing, and erosion, and increasingly so with rising sea levels and climate change.</p> <p>It is unclear how added and redistributed contaminants could impact nearshore environments into the future. It is therefore important to ensure robust sampling and testing procedures are carried out across impact sites and adjacent zones. Sampling wells at Illeginni should be maintained and sampled using scientifically robust procedures.</p> <p>Enhanced environmental monitoring of lagoon and seaward coral reefs, including long term site-specific data collection to monitor changes to coastal benthic habitats around</p>	<p>Thank you for your environmental comments and recommendations. The Navy and USASMDC appreciate the concerns NMFS presented in the submitted comments. USASMDC and the Navy have noted these concerns and responded to specific recommendations made by NMFS in comment items that follow.</p>

Navy CPS Weapon System Flight Tests EA/OEA
Appendix A – Public and Agency Involvement and Distribution

Comment Number	Comment	USASMDC and Navy Responses
	<p>Illeginni versus other similar sites, would be advantageous to support understanding of global versus local impacts to reefs there.</p> <p>Terminal payload impacts have the potential to affect species and habitats at Illeginni protected under the UES.</p> <p>Additive toxic effects on subsistence fisheries, even at small scale are, at this point, a cause for concern, given previously documented PCB and heavy metal contamination in such fisheries. Any added toxicity to locally consumed resources could be considered environmental injustice.</p> <p>Cumulation of minor additive environmental impacts can amplify the significance of each minor impact over time. It is important to avoid legal and harmful thresholds and ensure that sufficient monitoring is carried out to accurately track those impacts collectively.</p>	
NMFS-02	<p>Recommendation 1</p> <p>The Service recommends additional description of soil and water sampling procedures at Illeginni considering likely heterogeneous mixture of contaminants in soil there. Potential redistribution of legacy contaminants and maintaining sampling wells are points that warrant further description.</p>	<p>The Final EA/OEA includes more specific reference to the USASMDC Illeginni Islet soil and groundwater sampling plans which are in preparation by USASMDC. These sampling plans, including the associated sampling procedures, will be coordinated with NMFS and other UES Appropriate Agencies prior to finalization. Since the detailed sampling procedures are still being finalized, additional details were not added to the Final EA/OEA except by reference to the sampling plans which would contain those procedures.</p>
NMFS-03	<p>Recommendation 2</p> <p>The Service recommends developing a plan to continue long-term ecological monitoring (e.g. photogrammetry plots) at fixed sites to better understand nearshore (e.g. coral reef) ecosystems at Illeginni, including comparison to similar nearby environments. The Service can advise and/or continue to carry out photogrammetry monitoring as initiated in 2023 in order to document change over time.</p>	<p>Based on additional communications, USASMDC understands that NMFS has established initial photogrammetry plots at several USAKA islets. USASMDC would like to continue discussion with NMFS regarding the potential for long-term photogrammetry plots for monitoring reefs and for NMFS to continue carrying out this type of monitoring.</p> <p>The Navy has not included a measure for development of a plan to continue long-term ecological monitoring at fixed sites in the Navy CPS Final EA/OEA or DEP as these long-term USAKA-wide monitoring measures (if implemented) would be the responsibility of USASMDC or USAG-KA.</p>
NMFS-04	<p>Recommendation 3</p> <p>The Service recommends sampling Illeginni wildlife (e.g. shellfish tissues, fish fats and organs, bird blood, feathers, and/or egg shells) for heavy metals and other relevant contaminants to identify any potential transfer of contaminants to biological organisms.</p>	<p>USASMDC notes the NMFS's recommendation for additional sampling and testing of wildlife tissues for contaminants at USAKA and is willing to discuss this issue further with NMFS, in conjunction with the USAG-KA, in the future.</p> <p>The Navy has not included a measure for wildlife tissue sampling in the Navy CPS Final EA/OEA or DEP as the Navy's review and evaluation of available data indicate that the program's contribution to potential contaminants would be undetectable to minor. Any long-term USAKA-wide sampling or monitoring of legacy contaminants (if implemented) would be the responsibility of USASMDC or USAG-KA.</p>

Comment Number	Comment	USASMDC and Navy Responses
NMFS-05	<p>Recommendation 4</p> <p>The Service recommends additional reporting on past and ongoing sources of contaminants present in fish species locally harvested from Kwajalein lagoon, potential effects on consumers, and relationships between this and potential impacts (even minor, considering additive/cumulative effects) of the proposed activities in combination with other sources of contaminants. While the documents provided indicate that current available data do not allow for quantitative characterization of cumulative effect on biological or human resources at Kwajalein, tracking the available information is relevant to a thorough qualitative approach.</p>	<p>USASMDC is not aware of additional reports on past or ongoing sources of contaminants in fish species that were not presented in the Navy CPS Draft EA/OEA and NPA (See section 3.2.7 of the EA/OEA). Existing studies have shown that the primary human health risk contaminants in fish at USAKA are lead, pesticide chemicals, and some PCBs (APHC 2017). Studies have indicated that the predominant sources of historical pollution are thought to be sandblast material derived from maintenance operations and pesticides applied to building foundations (APHC 2017). These studies have also revealed that, despite several decades of payload testing at Illeginni Islet, potential contaminants associated with payload testing (i.e., metals) were not higher in fish tissues at Illeginni than at other samples sites in Kwajalein Atoll (APHC 2017). The primary contaminants found in fish tissues which contribute to human health risk at Illeginni are the pesticide chemical Chlordane and the PCBs Aroclors (APHC 2017) which are not used in flight testing. USASMDC and the Navy have included the currently available information relative to potential cumulative effects at Navy CPS activity locations which is summarized in the Navy CPS EA/OEA and NPA and detailed in cited reference documents such as the Final Southern USAG-KA Fish Study Report (APHC 2017).</p>
NMFS-06	<p>Recommendation 5</p> <p>The Service recommends additional consideration of any available options for offsetting potential contributions of proposed actions to contaminants found in fished species.</p>	<p>Based on review and evaluation of available data on fish contamination as well as the potential contaminants associated with Navy CPS flight testing, the primary concern for additive fish contamination due to flight testing would be potential increase in metals such as lead. Flight test activities would include clean-up of all visible impact debris. It is the intention to clean up all metal test debris after an Illeginni Islet impact, including onboard batteries. It is expected that very little test debris would remain. Because of test cleanup activities, the contribution of proposed activities to contaminants found in fish species (see APHC 2017) is expected to be none to undetectable. As stated in the response for comment number NMFS-05, the available evidence suggests that fish contamination at USAKA is primarily the result of historic maintenance activities and that metal contaminant levels in fish at Illeginni Islet are not statistically higher than at other USAG-KA utilized islets or at other islets.</p> <p>Navy CPS flight test activities are expected to have no to undetectable contributions to fish contaminants; therefore, the Navy finds that no offsetting options would need to be implemented for this program.</p>

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B

Definition of
Resources and
Regulatory Setting



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Appendix B. Definition of Resources and Regulatory Setting

This section includes definitions of resource topics analyzed in the EA/OEA as well as detailed information about the regulatory setting for those resource topics. These definitions and requirements outlined in the regulatory setting were utilized for description of the affected environment and evaluation of environmental consequences of the Proposed Action.

B.1. Air Quality

B.1.1 Definition of Resource

Air quality refers to the degree to which the air is suitable or clean enough for humans or the environment. Air quality is defined by the concentration of various pollutants in the atmosphere. Air pollution occurs when one or more pollutants (e.g., dust, fumes, gas, mist, odor, smoke, and vapor) are present in the outdoor atmosphere in quantities large enough to cause harm to the natural environment (i.e., human, plant, and animal life). A region's air quality is influenced by many factors including the type and quantity of pollutants emitted into the atmosphere, the size and topography of the air basin, and the prevailing meteorological conditions (e.g., wind and temperature). Most air pollutants originate from human-made sources, including mobile sources (e.g., cars, trucks, buses, ships, aircraft, and trains) and stationary sources (e.g., factories, industrial facilities, oil refineries, power plants, and boilers), as well as indoor sources (e.g., cleaning solvents). Air pollutants are also released from natural sources such as volcanic eruptions, forest fires, and animal biogenic emissions.

The earth's atmosphere consists of five major layers: troposphere, stratosphere, mesosphere, thermosphere, and exosphere. The earth's troposphere extends from the earth's surface to, on average, 8 miles in height. This layer holds all the air that plants need for photosynthesis and animals need to breathe, and also contains about 99% of all water vapors and aerosols. The stratosphere is located approximately 12 to 31 miles above earth's surface and contains the ozone layer. It is also the highest part of the atmosphere that jet planes can reach. Above the stratosphere is the mesosphere, which extends from about 31 to 53 miles above the earth's surface. Together, the stratosphere and mesosphere are considered the middle atmosphere. The thermosphere lies 53 to 375 miles above the earth's surface and is known as the upper atmosphere. The exosphere, which extends from about 375 to 6,200 miles, encompasses the orbits of most satellites. (NOAA 2024, NASA 2019)

B.1.2 Regulatory Setting

B.1.2.1 Broad Ocean Area

Federal Criteria Pollutants and Air Quality Standards

Under the Clean Air Act (42 United States Code [U.S.C.] Chapter 85), the USEPA established six pollutants defining air quality, called “criteria air pollutants.” They are carbon monoxide, sulfur dioxide, nitrogen dioxide, ozone, suspended particulate matter that measures less than or equal to 10 microns in diameter (PM₁₀) and particulate matter less than or equal to 2.5 microns in diameter (PM_{2.5}), and lead. Carbon monoxide, sulfur oxides, nitrogen oxides, lead, and some particulate matter are emitted directly into the atmosphere from emissions sources. Nitrogen oxides, ozone, and some particulate matter are formed through atmospheric chemical reactions that are influenced by weather, ultraviolet light, and other atmospheric processes. Volatile organic compounds and nitrogen oxides emissions are precursors of ozone and are used to represent ozone generation.

The Clean Air Act established National Ambient Air Quality Standards (NAAQS) for the criteria air pollutants (40 Code of Federal Regulations [CFR] § 50). The NAAQS protect against adverse health effects under primary standards and welfare effects (e.g., effects on soils, water, crops, vegetation, manmade materials, animals, wildlife, weather, visibility, climate, and property) under secondary standards. Each state and U.S. Territory/Commonwealth has the authority to adopt standards stricter than those established by USEPA.

Areas that are and have historically complied with the NAAQS or have not been evaluated for NAAQS compliance are designated as attainment areas. Areas that violate NAAQS are designated as nonattainment areas for the criteria air pollutant(s) that violate their standards. Areas that have transitioned from nonattainment to attainment are designated as maintenance areas. Nonattainment and maintenance areas are required to adhere to a State Implementation Plan to reach attainment or ensure continued attainment. The Atlantic BOA and the Pacific BOA are outside of 12 nautical miles (nm) from the U.S. shoreline and are therefore not considered within any U.S. regulated Air Quality Control Region (Florida Fish and Wildlife Conservation Commission 2023, Grymes 2017, NOAA 2023a). Thus, the Atlantic and Pacific BOAs are not subject to the NAAQS.

General Conformity

The USEPA General Conformity Rule applies to federal actions occurring in nonattainment or maintenance areas when the total direct and indirect emissions of nonattainment pollutants (or their precursors) exceed specified thresholds called *de minimis* levels specified at 40 CFR § 93.153. The USEPA defines *de minimis* levels, that is, the minimum threshold at which a conformity determination must be performed for various pollutants in various areas. Exceeding one of these applicable thresholds triggers requirements for a conformity determination. The *de minimis* levels (in tons per year) vary by pollutant and depend on the severity of the nonattainment status for the air quality management area in question. If the results of the applicability analysis indicate that the total emissions would not exceed the *de minimis*

emissions levels, then the conformity process is completed, and a general conformity determination is not required. The General Conformity Rule does not apply to federal actions occurring in attainment or unclassified areas, such as the Atlantic BOA.

Hazardous Air Pollutants / Mobile Sources

The USEPA implements national standards for Hazardous Air Pollutants (42 U.S.C. § 7412). Hazardous Air Pollutants, also known as toxic air pollutants or air toxics, are those pollutants that are known or suspected to cause cancer or other serious health effects, such as reproductive effects or birth defects, or adverse environmental effects. The National Emission Standards for Hazardous Air Pollutants regulate emissions of 188 Hazardous Air Pollutants from Stationary Sources (40 CFR § 61). Examples of Hazardous Air Pollutants include benzene, asbestos, and other specific volatile organic compounds/hydrocarbons; heavy metal compounds; and other particulate matter. Hazardous Air Pollutants emitted from mobile sources are called Mobile Source Air Toxics, which are compounds emitted from fuel combustion in vehicles, non-road equipment, vessels, and aircraft. The primary Mobile Source Air Toxics are 1,3-butadiene, acetaldehyde, acrolein, benzene, diesel particulate matter, ethylbenzene, formaldehyde, naphthalene, and polycyclic organic matter. The USEPA Final Rule for Control of Emissions of Hazardous Air Pollutants from Mobile Sources (40 CFR § 80) sets gasoline and vehicle emission standards. Unlike the criteria air pollutants, there are no NAAQS for benzene and other Hazardous Air Pollutants. The primary control methodologies for these pollutants for mobile sources involve reducing their content in fuel and altering the engine operating characteristics to reduce the volume of pollutant generated during combustion.

Stratospheric Ozone Depletion

The stratosphere extends from approximately 12 to approximately 31 miles above the Earth's surface and contains the Earth's ozone layer. This layer is important in absorbing harmful ultraviolet radiation from the sun. Over the last few decades, anthropogenic (human-made) gases released into the atmosphere, mainly chlorine-containing substances, have threatened ozone concentrations in the stratosphere which filter harmful ultraviolet sunlight. Chlorofluorocarbons and halons have been widely used in electronics and refrigeration systems and fire extinguishing agents. Once released, these gases mix in the atmosphere worldwide until they reach the stratosphere, where ultraviolet radiation releases their chlorine, fluorine, and bromine components. Global compliance with the 1987 Montreal Protocol on Substances that Deplete the Ozone Layer and amendments has resulted in significantly reduced worldwide production of chlorofluorocarbons and other ozone-depleting substances, including bans in many countries by specific dates. In 2022 National Oceanic and Atmospheric Administration scientists announced that based on an annual analysis of air samples collected at remote sites around the globe, there is evidence of a continuous decline in the atmospheric concentration of ozone-depleting substances. This decline shows that the threat to the ozone layer is receding below the 2022 significant milestone. In early 2022, the overall concentration of ozone-depleting substances in the mid-latitude stratosphere had fallen over 50% back to levels observed in 1980, before ozone depletion was significant. (NOAA 2022d)

High-temperature afterburning reactions in the exhaust plume of rockets can contribute to overall global chlorine loading, which contributes to ozone depletion. Stratospheric hydrogen chloride can have a half-life of 2.3 years, but hydrogen chloride from rocket emissions could have longer lifetimes because part of the emissions occurs at atmospheric levels above the stratosphere. Aluminum oxide, which is emitted from the rocket exhaust as solid particles, could contribute to ozone depletion via activation of chlorine in the atmosphere. Emissions of nitrogen oxides produced in the exhaust plume of rockets can also contribute to stratospheric ozone depletion (DON and U.S. Army 2022).

Greenhouse Gases

Per Navy policy OPNAV M-5090.1, the action proponent must address the potential effects of a proposed action on regional or global climate. Where possible, the analysis should quantify greenhouse gas (GHG) emissions (DON 2021). The USEPA has identified GHGs as carbon dioxide, methane, nitrogen oxide, hydrofluorocarbons, perfluorocarbons, sulfur hexafluoride, and other fluorinated gases including nitrogen trifluoride and hydrofluorinated ethers. Each GHG is assigned a global warming potential. The global warming potential is the ability of a gas or aerosol to trap heat in the atmosphere; this rating system is standardized to carbon dioxide (DON 2022b).

GHGs are not considered criteria air pollutants and are not specifically called out for regulation in the Clean Air Act, but the USEPA has the authority to regulate GHGs under the Clean Air Act (Massachusetts v. EPA, 549 U.S. 497 [2007]). Navy installations that emit GHGs above established thresholds are required to comply with applicable requirements of the GHG Reporting Program, state rules, and USEPA permitting requirements. The Navy reports its GHG emissions inventory annually to the Office of the Secretary of Defense. (DON 2021)

One indicator of potential significance for GHG emissions is the USEPA's GHG reporting threshold of 25,000 metric tons per year (27,558 short tons per year) within 40 CFR § 98. In practice, this rule only applies to stationary sources (USEPA 2023). The Proposed Action would almost exclusively generate mobile source emissions. The 2023 (9 January) Council on Environmental Quality "Notice of Interim Guidance on GHG Emissions in NEPA" acknowledges the increasing urgency of the climate crisis and advances in climate science and GHG analysis techniques. The guidance makes essentially three recommendations to federal agencies which include the following (CEQ 2023, McCormick and Wortzel 2023):

- (1) Encourages federal agencies to quantify the reasonably foreseeable GHG emissions of a proposed action and its alternatives when possible, but the guidance does not generate any particular quantity of GHG emissions as "significantly" disturbing the quality of the human environment. The guidance overall recommends that agencies apply appropriate tools and methodologies to quantify GHG emissions, compare GHG emission quantities across alternative scenarios, and place emissions in relevant context, including how they relate to climate action commitments and goals. If tools or data are not reasonably available to quantify GHG emissions, the reasons for why quantification is not possible should be provided along with seeking to present a reasonable estimated range of emissions. If a reasonable range of potential GHG

emissions cannot be provided, the agency should provide a qualitative analysis and its rationale for determining that a quantitative analysis is not possible.

- (2) Agencies should disclose and provide background information for GHG emissions and climate effects to help decision makers and the public comprehend the potential GHG emissions and climate change consequences of the proposed action.
- (3) The Interim Guidance discusses how agencies can best use the NEPA scoping process to determine the extent to which a more detailed analysis of climate change and GHG emissions is appropriate.

State, Local, U.S. Territory/Commonwealth Regulatory Setting

Beyond 200 nm from the east coast shore, the Atlantic BOA does not have an air quality regulatory body that has jurisdiction over the region. State jurisdiction over the ocean varies from state to state and extends out to 3 to 12 nm from the shoreline, with federal jurisdiction beyond the state jurisdiction to the 200-nm point. Because the Atlantic study area begins approximately 50 nm from the U.S. East Coast, federal jurisdiction applies to this analysis, but state jurisdiction does not.

As in the Atlantic Ocean, state jurisdiction over the Pacific Ocean varies from state to state and extends out 3 to 12 nm from the shoreline, with federal jurisdiction beyond the state jurisdiction to the 200-nm point (Washington Marine Spatial Planning 2015; California Ocean Protection Council 2007, Hawaii Statewide GIS Program 2020, NOAA 2023a). Because the Pacific study area begins approximately 50 nm from the coast of Southern California and the Hawaiian Islands, federal jurisdiction applies to this analysis, but state jurisdiction does not.

There are U.S. territories in the Pacific BOA (e.g., Midway Islands and Johnston Atoll); however, they are a significant distance from where Proposed Action activities would occur.

B.1.2.2 Kwajalein Atoll

The UES outlines air quality standards and procedures in Sections 1-5.3, 2-8.1.1, and 3-1. UES Section 3-1 details the air quality standards that are applicable to activities of the U.S.

Government at USAKA. UES Section 3-1 is derived from applicable sections of 40 CFR 50 through 87, which establish air quality regulations to meet the Clean Air Act. UES Section 2-22 states that all NEPA analyses for USAKA actions shall incorporate appropriate climate change analysis within NEPA documents. Although the UES air quality standards and procedures basically follow the Clean Air Act, they do not incorporate many procedural or mandatory technology-based requirements under the Clean Air Act. The UES air quality standards are designed to maintain the current air quality at USAKA. Ambient air concentrations for criteria pollutants are not allowed to be increased above the level predicted to exist on the effective date of the UES by more than an increment of 25% of the NAAQS for each criteria pollutant. Under no circumstances are ambient air concentrations for a criteria air pollutant allowed to exceed 80% of the NAAQS. In general, the UES standards are addressing effectiveness in terms of ambient air quality effects rather than through application of technology-based controls. All significant stationary sources of criteria pollutants, Hazardous Air Pollutants, and activities

covered by U.S. National Emission Standards for Hazardous Air Pollutants must be governed by a Document of Environmental Protection. A Document of Environmental Protection is subject to review and agreement by U.S. and RMI agencies, including the USEPA, USFWS, NMFS, U.S. Army Corps of Engineers, and RMI Environmental Protection Authority, as well as public review. All current National Emission Standards for Hazardous Air Pollutant rules are adopted by reference in the UES. General provisions are included for maintaining inventories of emission sources, reporting, eliminating, or reducing the use of chemicals associated with Hazardous Air Pollutants, and eliminating or reducing the use of ozone-depleting substances (U.S. Air Force 2020a, USASMDC 2024).

B.2. Cultural Resources

B.2.1 Definition of Resource

Cultural resources are sites, buildings, structures, objects, or districts considered important to a culture, subculture, or community for scientific, traditional, religious, or other purposes. They include archaeological resources, historic built environment architectural or engineering resources, and traditional cultural resources.

Archaeological resources comprise areas where human activity has measurably altered the earth or where deposits of physical remains are found (e.g., projectile points and bottles), but standing structures do not remain. Built environment resources include standing buildings, bridges, dams, other structures, and designed landscapes of historic or aesthetic significance. Generally, built environment resources must be more than 50 years old to warrant consideration for the U.S. National Register of Historic Places (NRHP). More recent structures might warrant consideration if they are of exceptional importance or if they have the potential to gain significance in the future. Resources of traditional, religious, and cultural importance can include archaeological resources, sacred sites, structures, neighborhoods, prominent topographic features, habitat, plants, animals, or minerals considered essential for the preservation of traditional culture.

The National Historic Preservation Act (NHPA) defines historic properties as buildings, structures, sites, districts, or objects listed in or eligible for listing in the NRHP. Resources found significant under NRHP criteria are considered eligible for listing in the NRHP. Historic properties are generally 50 years of age or older, are historically significant, and retain sufficient integrity to convey their historic significance. Such resources might provide insight into the cultural practices of previous civilizations, or they might retain cultural and religious significance to modern groups. Traditional Cultural Properties, including Traditional Cultural Landscapes, are recognized as geographical areas of cultural or religious significance to a cultural group or one or more Tribes. Typically, Traditional Cultural Properties must meet the NRHP criteria of eligibility, may be considered as a site or district in the NRHP lexicon, and the associated cultural group or groups are recognized as having unique knowledge and understanding of the significance and associations of the geographical area. Cultural resources designated as National Historic Landmarks are historic properties of exceptional national significance.

B.2.2 Regulatory Setting

B.2.2.1 Kwajalein Atoll

Federal laws that pertain to cultural resources management include the NHPA (1966), the Archeological and Historic Preservation Act (1974), the American Indian Religious Freedom Act (1978), the Archaeological Resources Protection Act (1979), and the Native American Graves Protection and Repatriation Act (1990). Under Section 106 of the NHPA, federal agencies must consider the effects of their undertakings (project) on historic properties and afford the Advisory Council on Historic Preservation a reasonable opportunity to comment. Under this process, the federal agency evaluates the NRHP eligibility of resources within the proposed undertaking's area of potential effects and assesses the possible effects of the proposed undertaking on historic properties in consultation with the State Historic Preservation Office and other consulting or interested parties, including the public. Section 110 of the NHPA requires an additional level of stewardship by federal agencies to minimize harm to a National Historic Landmark when one may be directly and adversely affected by an undertaking.

Cultural resources management and legislation in the RMI closely mirrors the compliance procedures for Section 106 of the NHPA. However, the RMI has its own Historic Preservation Officer and Advisory Council on Historic Preservation, and all consultation, coordination, and communication with these entities and United States Army Garrison–Kwajalein Atoll (USAG-KA) require concurrent notification with the RMI Environmental Protection Authority (USASMDC 2024). The RMI NRHP is also similar to the U.S. NRHP, but includes additional property types (oral traditions, submerged resources, and geographic locations), as well as additional significance criteria that include cultural and social values, interpretive value, and historical ambience. Additionally, properties 40 years or older are expected to be considered for cultural resource evaluations and associated plans (USASMDC 2024).

The UES is the guiding document for planning future activities and compliance at USAKA (USASMDC 2024). These standards are based primarily on federal agency responsibilities codified in U.S. laws, federal and U.S. Army regulations, and Executive Orders (EOs), but also include subsidiary regulations for promoting cultural preservation based on the RMI Historic Preservation Act of 1991. The standards substitute the RMI NRHP and its listing criteria for the corresponding U.S. NRHP listing criteria.

B.3. Biological Resources

B.3.1 Definition of Resource

For the purposes of this EA/OEA, biological resources are defined as native or naturalized vegetation and wildlife and the habitats in which they occur. Plant and plant communities are referred to as vegetation and animal species are referred to as wildlife. Habitat is defined as the biotic and abiotic conditions that support plant or animal species. Within this EA/OEA, biological resources are divided into five major categories: (1) terrestrial vegetation, (2) terrestrial wildlife, (3) marine vegetation, (4) marine wildlife, and (5) environmentally sensitive habitats. Within

each category, descriptions focus on important or special-status species and habitats. Special-status species refers to those species listed by federal or state agencies including those afforded protection under the regulations listed in the Regulatory Setting subsections. Environmentally sensitive habitats are those areas designated by the USFWS or NMFS as critical habitat for ESA listed species, habitats protected by other regulations, or other sensitive habitats such as wetlands, habitats limited in distribution, or important seasonal use areas for wildlife (e.g., breeding areas, feeding areas, or migration routes). Biological resources within the affected environment for the Proposed Action are described with the purpose of evaluating the effects of the Proposed Action and in proportion to the magnitude of potential effects.

B.3.2 Regulatory Setting

B.3.2.1 Broad Ocean Area

Endangered Species Act

The purpose of the ESA is to conserve the ecosystems upon which threatened and endangered species depend and to conserve and recover listed species. Section 7 of the ESA requires action proponents to consult with the USFWS or NMFS to ensure that their actions are not likely to jeopardize the continued existence of federally listed threatened and endangered species or result in the destruction or adverse modification of designated critical habitat (16 U.S.C. §§ 1531-1544). For all ESA listed species, the ESA defines harm as an act which kills or injures wildlife including significant habitat modification or degradation where it kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering (16 U.S.C. §§ 1531-1544). The ESA defines harassment as an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering.

Magnuson-Stevens Fishery Conservation and Management Act

The MSA (16 U.S.C. § 1801 et seq.) provides for the conservation and management of U.S. fisheries. Under the MSA, EFH consists of the waters and substrate needed by fish to spawn, breed, feed, or grow to maturity. An EFH may include U.S. waters within exclusive economic zones (EEZ; from the territorial sea baseline out to a distance of 200 nm) and covers all fish species within a fishery management unit (50 CFR § 600.805). Under the MSA, an adverse effect means any impact that reduces quality and/or quantity of EFH (50 CFR § 600.810). Adverse effects may include direct or indirect physical, chemical, or biological alterations of the waters or substrate and loss of, or injury to, benthic organisms, prey species and their habitat, and other ecosystem components, if such modifications reduce the quality and/or quantity of EFH (50 CFR § 600.810). EFH and its geographic boundaries are defined by regional fisheries management councils. Federal agencies must evaluate the effects of an action on EFH and must consult with NMFS on actions that may adversely affect EFH (67 Federal Register [FR] 2343 [January 17, 2002]).

Marine Mammal Protection Act

All marine mammals are protected under the provisions of the Marine Mammal Protection Act (16 U.S.C. § 1361 et seq.). The Marine Mammal Protection Act prohibits any person or vessel from “taking” marine mammals in the United States or the high seas without authorization. As defined by the Marine Mammal Protection Act, Level A harassment of cetaceans is any act that has the potential to injure a marine mammal or marine mammal stock in the wild. Level B harassment is defined as any act that has the potential to disturb a marine mammal or marine mammal stock in the wild by causing behavioral pattern disruptions, including but not limited to migration, breathing, nursing, breeding, feeding, or sheltering. The National Defense Authorization Act of Fiscal Year 2004 (Public Law 108-136) amended the definition of harassment as it applies to military readiness activities or scientific research activities conducted by or on behalf of the Federal Government, consistent with Section 104(c)(3). In this Act, military readiness activities were defined as “all training and operations of the Armed Forces that relate to combat” and “the adequate and realistic testing of military equipment, vehicles, weapons, and sensors for proper operation and suitability for combat use.” For military readiness activities Level B harassment is defined as any act that disturbs or is likely to disturb a marine mammal or marine mammal stock in the wild by causing disruption of natural behavioral patterns including, but not limited to, migration, surfacing, nursing, breeding, feeding, or sheltering to a point where such behavioral patterns are abandoned or significantly altered [16 U.S.C. 1362 (18)(B)(i) and (ii)]. Section 101(a)(5) of the Marine Mammal Protection Act directs the Secretary of the Department of Commerce to allow, upon request, the incidental (but not intentional) taking of marine mammals if certain findings are made and regulations are issued. Under the Marine Mammal Protection Act, marine mammal stocks can be listed as depleted. The term depleted is defined as any case in which a species or population stock is determined to be below its optimum sustainable population.

Migratory Bird Treaty Act

Migratory and most native-resident bird species are protected under the Migratory Bird Treaty Act (16 U.S.C. §§ 703-712), and their conservation by federal agencies is mandated by EO 13186, Migratory Bird Conservation. Under the Migratory Bird Treaty Act it is unlawful by any means or in any manner, to pursue, hunt, take, capture, kill, attempt to take, capture, or kill, [or] possess migratory birds or their nests or eggs at any time, unless permitted by regulation. Under EO 13186, federal agencies must evaluate the effects of actions on migratory birds with emphasis on species of concern, which were later defined as birds of conservation concern by the USFWS (USFWS 2021a). Birds listed as birds of conservation concern are species with the highest conservation priority which without additional conservation actions are likely to become candidates for listing under the ESA (USFWS 2021a). The 2003 National Defense Authorization Act gave the Secretary of the Interior authority to prescribe regulations to exempt the Armed Forces from the incidental taking of migratory birds during authorized military readiness activities. Congress has defined military readiness activities as all training and operations of the U.S. Armed Forces that relate to combat and the adequate and realistic testing of military equipment, vehicles, weapons, and sensors for proper operation and suitability for combat use (16 U.S.C. § 703 note). As directed by Section 315 of the Authorization Act, the USFWS issued

a final rule authorizing incidental take, with limitations, that result from military readiness activities of the Armed Forces (72 FR 8931 [February 28, 2007]). The final rule authorizing the Department of Defense (DoD) to take migratory birds in such cases includes a requirement that the Armed Forces must confer and cooperate with USFWS to develop and implement appropriate conservation measures to minimize or mitigate adverse effects of the proposed action if the action is likely to result in a significant adverse effect on the sustainability of a population of a migratory bird species (50 CFR § 21.42).

National Marine Sanctuaries Act

Each national marine sanctuary has its own set of regulations within subparts of 15 CFR § 922. Subparts A through E contain regulations that apply to all sanctuaries and subparts F through R each contain the sanctuary-specific regulations for all 14 sanctuaries. While each sanctuary has its own unique set of regulations, there are some regulatory prohibitions that are typical for many sanctuaries including prohibitions on discharging material or other matter into the sanctuary; disturbance of, construction on, or alteration of the seabed; disturbance of cultural resources; and exploring for, developing, or producing oil, gas, or minerals. In addition, some sanctuaries prohibit other activities, such as the disturbance of marine mammals, seabirds and sea turtles, operation of aircraft in certain zones, use of personal watercraft, mineral mining, and anchoring of vessels. If a federal agency finds that a proposed action is likely to injure sanctuary resources, the agency is required to submit a “written statement” to the Office of National Marine Sanctuaries describing the potential effects of the activity on sanctuary resources and must consult with the National Oceanic and Atmospheric Administration on activities that trigger the need to consult.

National Monuments

Marine national monuments are designated by Presidential Proclamation via the Antiquities Act of 1906 (54 U.S.C. § 320301 et seq.). U.S. Marine National Monuments are designated within U.S. EEZs. These areas have prohibitions on injuring, disturbing, or damaging monument resources, including biological resources. There are also prohibitions on placing or abandoning any structure, material, or other matter on the submerged lands. However, activities and exercises of the U.S. Armed Forces are exempt from these national monument prohibitions.

Other Biological Resource-Related Executive Orders

This EA/OEA also evaluates the effects of the action on biological resources as required by EO 13112, Invasive Species; EO 13089, Coral Reef Protection; EO 13158, Marine Protected Areas; EO 12114, Environmental Effects Abroad of Major Federal Actions; and DoD procedures for implementing EO 12114 (32 CFR § 187).

B.3.2.2 Kwajalein Atoll

The Kwajalein Atoll ROI occurs within the RMI. As such, the evaluation of biological resources follows regulatory requirements set forth in EO 12114, Environmental Effects Abroad of Major Federal Actions, as well as those outlined in the UES as described below.

UES

The Compact of Free Association between the RMI and the United States (48 U.S.C. § 1921) requires all U.S. Government activities at USAKA and all DoD and Ronald Reagan Ballistic Missile Defense Test Site (RTS) activities in the RMI to conform to specific compliance requirements, coordination procedures, and environmental standards identified in the UES. As specified in Section 2-2 of the UES, these standards also apply to all activities occurring in the territorial waters of the RMI. Navy CPS test activities would take place at Illeginni Islet and in Kwajalein Atoll waters and must comply with the UES (USASMDC 2024). Under the UES, any action carried out at USAKA must be reviewed to determine if the action may affect UES-protected species or habitats. An action which may affect special-status biological resources at USAKA requires coordination and/or consultation with UES Appropriate Agencies as specified in Section 3-4 of the UES. Under the UES, any species listed, proposed for listing, or candidates for designation under the U.S. ESA are considered consultation species in UES Appendix 3-4A. Therefore, any species newly proposed for listing under the ESA would be subject to consultation requirements of UES Section 3-4.5. Similarly, the RMI may designate critical habitats which would be listed in Appendix 3-4B of the UES, and potential effects on those critical habitats would need to be considered at the time of designation. Under UES Section 2-18.3.1, a Document of Environmental Protection is required for an action or activities for which a biological opinion has been rendered, or that would have a significant effect on wildlife species or habitats or involve migratory bird takings.

B.4. Geology and Soils

B.4.1 Definition of Resource

Coral atolls are composed of coral islands and islets that have accumulated on reefs, or in shallow encircled lagoons that formed on top of ancient volcanoes that have long since submerged below sea level. These large underwater mountains have been capped by mostly limestone since they are constructed by calcium carbonate-secreting organisms such as coral polyps and algae. The overlying coral superstructures may be hundreds or even thousands of feet thick. Emergent portions of the reef and islands tend to be composed of loose, poorly consolidated calcareous materials derived from foraminifera, coral, shells, and marine algae, or their debris resulting from destructive action of the sea, sun, and wind (RGNext 2020). All of the islands that make up Kwajalein Atoll are relatively flat with few natural points exceeding 15 feet (ft) above mean sea level (RGNext 2020).

The detailed geology of Kwajalein Atoll is primarily based on shallow boring log books prepared by the U.S. Army Corps of Engineers and drilling logs prepared during the construction of monitoring wells by the U.S. Geological Survey (RGNext 2020). Soils across the atoll mainly consist of unconsolidated, reef-derived calcium carbonate sand and gravel with minor consolidated layers of coral, sandstone, and conglomerate (RGNext 2020).

B.4.2 Regulatory Setting

B.4.2.1 Kwajalein Atoll

The Compact of Free Association between the RMI and the United States (48 U.S.C. § 1921) requires all U.S. Government activities at USAG-KA and all DoD and RTS activities in the RMI to conform to specific compliance requirements, coordination procedures, and environmental standards identified in the UES. As specified in Section 2-2 of the UES, these standards also apply to all activities occurring in the territorial waters of the RMI. The Proposed Action could impact Illeginni Islet or the deep ocean waters of Kwajalein Missile Impact Scoring System (KMISS) northeast of USAG-KA. Therefore, the Proposed Action must comply with the UES (USASMDC 2024).

Compliance goals for contaminant levels in soils and sediments are set by the UES. According to UES Section 3-6.5.4(c)(5)(i) and (ii), for beryllium, USAG-KA shall use an initial USEPA Regional Screening Level of 160 milligrams per kilogram (mg/kg) for assessing the need for cleanup under UES Section 3-6.5.8 to assess non-cancer risk for unrestricted use. For depleted uranium, USAG-KA shall use a derived screening level for insoluble uranium salts of 47 mg/kg for assessing the need for cleanup under UES Section 3-6.5.8 to assess non-cancer risk for unrestricted use. The UES does not specify a compliance goal for tungsten in soil; therefore, per UES guidance, the USEPA Region 9 Regional Screening Level of 63 mg/kg for residential areas and 930 mg/kg for industrial areas is used as a screening criterion instead (USASMDC 2024, USEPA 2022b, USEPA 2022f). **Table 3.2.4-1 in Section 3.2.4.3** summarizes the regulatory limits and historical sampling results for beryllium, tungsten, and depleted uranium at Illeginni Islet.

B.5. Water Resources

B.5.1 Definition of Resource

This section summarizes existing information on water resources within the affected environment, specifically those areas potentially subject to pre- and post-flight operations and proposed payload impact at Illeginni Islet as well as the proposed deep ocean impact site at KMISS. Water resources include those aspects of the natural environment related to the availability and characteristics of water.

B.5.2 Regulatory Setting

B.5.2.1 Kwajalein Atoll

The Kwajalein Atoll ROI is within the RMI. As such, the evaluation of water resources follows regulatory requirements set forth in EO 12114, Environmental Effects Abroad of Major Federal Actions, as well as those outlined in the UES as described below.

The UES and its procedures apply to all activities of the U.S. Government that occur on the USAG-KA/RTS controlled islands, the Mid-Atoll Corridor, as well as all USAG-KA/RTS

controlled activities within the RMI, including the territorial waters of the RMI (USASMDC 2024). For UES standards regarding water quality and reef protection see UES Sections 1-5.4 and 3-2. UES compliance goals for contaminant levels in groundwater are as follows. For beryllium, the maximum contaminant level is 4 micrograms per liter (UES Appendix 3-2D, Groundwater Quality). The uranium maximum contaminant level is 30 micrograms per liter (UES Section 3-3.5.6.1(c)). The UES does not specify a uranium maximum contaminant level for groundwater; therefore, the drinking water standards were used. The UES does not specify a compliance goal for tungsten in groundwater; therefore, per UES guidance, the USEPA Region 9 Residential Tap Water Screening Level of 16 micrograms per liter is used instead (USASMDC 2024, USEPA 2022b, USEPA 2022f). **Table 3.2.5-1** in **Section 3.2.5.3** summarizes the regulatory limits and historical groundwater sampling results for beryllium, tungsten, and uranium at Illeginni Islet.

B.6. Hazardous Materials and Waste Management

B.6.1 Definition of Resource

For the purposes of this EA/OEA, hazardous materials and hazardous wastes are substances defined as hazardous in the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (42 U.S.C. § 9601). Under CERCLA, hazardous substances are defined with references to the Clean Water Act, Clean Air Act, Resource Conservation and Recovery Act, and Toxic Substance Control Act. In general, hazardous materials and wastes are substances that pose a physical hazard or a health hazard, including toxic, carcinogenic, combustible, flammable, oxidizing, reactive, and unstable substances (29 CFR § 1910).

Ocean pollution is defined as the introduction of non-normal and harmful contaminants into the marine environment. Ocean pollution includes marine debris which is defined as any persistent solid material that is intentionally or unintentionally disposed of or abandoned into the marine environment (NOAA 2023c).

B.6.2 Regulatory Setting

B.6.2.1 Broad Ocean Area

Regulatory requirements for hazardous materials and wastes in the BOAs include requirements under CERCLA (42 U.S.C. § 9601 et seq.), the Clean Water Act (42 U.S.C. § 7401 et seq.), the Clean Air Act (33 U.S.C. § 1251 et seq.), the Resource Conservation and Recovery Act (42 U.S.C. § 6901 et seq.), the Toxic Substances Control Act (15 U.S.C. § 2601 et seq.), the Emergency Planning and Community Right-to-Know Act (42 U.S.C. § 116 et seq.), and the Hazardous Materials Transportation Act (49 U.S.C. § 5101 et seq.), among others. Under these laws, the USEPA and the Department of Transportation have the responsibility of defining hazardous materials and waste as well as regulating the use, discharge, storage, transportation, disposal, and cleanup of these substances. Navy operations ashore and afloat must comply with Navy policies and procedures regarding hazardous materials, waste management, pollution prevention, and recycling as specified in OPNAV M-5090.1.

Under CERCLA, the USEPA defines hazardous substances and identifies reportable quantities of these substances (40 CFR § 302.4). Any release (other than federally permitted release) of hazardous substances in excess of the defined reportable quantities requires notification of the USEPA's National Response Center which subsequently notifies all appropriate agencies (42 U.S.C. § 9603.a). The current CERCLA list of hazardous substances and reportable quantities is found within 40 CFR § 302.4.

The Defense Environmental Restoration Program was created in 1986 under CERCLA to facilitate thorough investigation and cleanup of contaminated sites on military installations (active installations, installations subject to Base Realignment and Closure, and formerly used defense sites). The Installation Restoration Program and the Military Munitions Response Program are components of the Defense Environmental Restoration Program. The Installation Restoration Program requires each DoD installation to identify, investigate, and clean up hazardous waste disposal or release sites. The Military Munitions Response Program addresses nonoperational rangelands that are suspected or known to contain unexploded ordnance, discarded military munitions, or munitions constituent contamination. The Navy's Environmental Restoration Program is the Navy's initiative to address Defense Environmental Restoration Program requirements.

The Resource Conservation and Recovery Act, as amended, authorizes the USEPA to control hazardous wastes and establishes a framework for solid waste control. Under the Resource Conservation Recovery Act, the USEPA has established regulations for dumping of wastes as well as management of hazardous wastes from generation to final disposal. Regulated hazardous wastes under the Resource Conservation and Recovery Act include any solid, liquid, contained gaseous, or semisolid waste or combination of wastes that exhibit one or more of the hazardous characteristics of ignitability, corrosivity, toxicity, or reactivity, or is listed as a hazardous waste under 40 CFR § 261.

Certain types of hazardous wastes are subject to special management provisions intended to ease the management burden and facilitate the recycling of such materials. These are called universal wastes and their associated regulatory requirements are specified in 40 CFR § 273. Four types of waste are currently covered under the universal waste regulations: hazardous waste batteries, hazardous waste pesticides that are either recalled or collected in waste pesticide collection programs, hazardous waste thermostats, and hazardous waste lamps, such as fluorescent light bulbs.

The USEPA has established regulations applicable to military munitions as solid and hazardous wastes under the Resource Conservation and Recovery Act in 40 CFR § 266 subpart M. A military munition is not defined as a solid waste when it is used for its intended purpose (including training and testing) or is unused but may be defined as a solid waste when a used munition is recovered, collected, and/or transported off range or from the site of use (40 CFR § 266.202). The USEPA has also established a set of criteria and standards applicable to the storage, transportation, treatment, and disposal of any items deemed to be waste military munitions (40 CFR § 266.206).

Under the Hazardous Materials Transportation Act, hazardous materials and wastes are defined by 49 CFR § 171.8 and include hazardous substances, hazardous wastes, and marine pollutants. Transportation of hazardous materials is regulated under the requirements of this act by the U.S. Department of Transportation.

Ocean dumping of materials is defined and regulated by the USEPA under the Marine Protection, Research, and Sanctuaries Act. The purpose of this act is to regulate the transportation of material from the United States (or to the United States by a U.S. vessel or agency) for the purpose of dumping the material into ocean waters. Ocean dumping, as defined by the Act, is prohibited except as authorized by a permit issued by the USEPA. Ocean dumping does not apply to intentional placement of any device in ocean waters or submerged land for a purpose other than disposal when such placement is an authorized federal or state program (33 U.S.C. § 1402). With regards to military expended materials, the U.S. Senate has further clarified that if “material from missiles and debris from gun projectiles and bombs ultimately come to rest in the protected waters. Such activities are not covered by this Act” (Senate Report Number 92-451).

USEPA is given authority to regulate special hazard substances by the Toxic Substances Control Act. Special hazards are those substances that might pose a risk to human health and are addressed separately from other hazardous substances. Special hazards include asbestos containing material, polychlorinated biphenyls (PCBs), and lead-based paint. Asbestos is also regulated by USEPA under the Clean Air Act and CERCLA.

B.6.2.2 Kwajalein Atoll

The regulatory setting for hazardous materials and wastes at Kwajalein Atoll includes requirements set forth under the UES (USASMDC 2024). The requirements within the UES were primarily derived from U.S. regulations pertaining to hazardous materials and wastes and as such the regulatory setting at Kwajalein Atoll includes the regulations described in **Section B.6.2.1**, including relevant definitions.

At USAKA, the UES provides standards for material management to identify, classify, and manage in an environmentally responsible way all materials imported or introduced for use at USAKA to prevent pollution (USASMDC 2024). Related to hazardous materials and wastes, the UES includes standards and requirements related to air quality, water quality, ocean disposal, and material and waste management (USASMDC 2024). The UES prohibits all new PCB or PCB items and asbestos from being imported or used for operations. In compliance with the UES, the U.S. Army was required to prepare a Hazardous Materials Management Plan outlining the management procedures for the storage, use, transportation, and disposal of hazardous materials and petroleum products at USAKA (USASMDC 2024). The U.S. Army is also required to prepare and implement a Kwajalein Environmental Emergency Plan which identifies hazardous materials storage facilities and procedures for responding to releases of hazardous materials (USASMDC 2024).

B.7. Environmental Justice

B.7.1 Definition of Resource

Environmental justice is defined as the just treatment and meaningful involvement of all people, regardless of income, race, color, national origin, Tribal affiliation, or disability, in decision-making and activities that affect human health and the environment (88 FR 25251 [April 26, 2023]). Environmental justice involves the evaluation of potential disproportionate and adverse human health and environmental effects, including cumulative effects. Environmental justice also requires that opportunities be provided for meaningful engagement of people or communities with environmental justice concerns who would potentially be affected by federal activities.

B.7.2 Regulatory Setting

B.7.2.1 Kwajalein Atoll

An environmental justice analysis is included in this document to comply with the intent of EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations; EO 14096, Revitalizing Our Nation’s Commitment to Environmental Justice for All; EO 13045 (as amended), Federal Actions to Address Protection of Children from Environmental Health Risks and Safety Risks; EO 12114, Environmental Effects Abroad of Major Federal Actions; and Navy and DoD guidance.

EO 12898 states that “each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations.” EO 14096 is intended to ensure that every person has clean air to breathe; clean water to drink; safe and healthy foods to eat; and an environment that is healthy, sustainable, climate-resilient, and free from harmful pollution and chemical exposure. In addition, these EOs require that minority and low-income populations be given access to information and opportunities to provide input to decision-making on federal actions.

The Kwajalein Atoll ROI occurs within the RMI. As such, all proposed activities within Kwajalein Atoll would be subject to the standards and requirements of the UES. The primary purpose of the UES is to provide comprehensive and consolidated procedures to protect public safety and the USAKA environment (USASMDC 2024). Proposed activities within Kwajalein Atoll must comply with standards outlined in the UES which specify procedures for public and agency participation in review of United States actions occurring in the RMI (USASMDC 2024).

B.8. Health and Safety

B.8.1 Definition of Resource

Health and safety includes consideration of any activities, occurrences, or operations that have the potential to affect the well-being, safety, or health of workers (including those in the armed forces) and members of the public. Health and safety issues include potential hazards inherent with operation of Navy and other vessels, missile launch and testing, target operations, and abatement of munitions items that fail to operate as intended. Health and safety also addresses issues of public proximity and access.

In general, a safe environment is one in which the potential for death, serious bodily injury, illness, or property damage is reduced to the maximum extent practicable. Necessary elements for an accident-prone situation or environment include the presence of the hazard and an exposed (and potentially susceptible) population.

B.8.2 Regulatory Setting

B.8.2.1 Broad Ocean Area

Numerous federal and state regulatory requirements have been enacted for the well-being of workers and the general population. DoD and Navy policies are designed to meet the standards issued by the Occupational Safety and Health Administration, which include established laws and regulations to ensure safe working conditions through enforcing standards and training requirements.

The Navy adheres to internal health and safety standards and DoD standards. Specific regulations and procedures for maintaining a safe environment for personnel and the public are found in the following documents:

- DoD Directive 6055.09E, Explosives Safety Management (2019)
- DoD Instruction 4540.01, Use of International Airspace by U.S. Military Aircraft and for Missile and Projectile Firings (2017)
- DoD Instruction 6055.01, DoD Safety and Occupational Health Program (2014)
- DoD Instruction 6055.05, Occupational and Environmental Health (2018)
- DoD Instruction 6055.07, Mishap Notification, Investigation, Reporting, and Record Keeping (2018)
- OPNAVINST 3770.2L, Department of the Navy Airspace Procedures and Planning (2017)
- OPNAVINST 5100.19F, Navy Safety and Occupational Health Program Manual for Forces Afloat (2019)
- OPNAVINST 5100.23H, Safety and Occupational Health Program (2020)

- OPNAV Manual 5100.23, Navy Safety and Occupational Health Manual (2020)
- Secretary of the Navy Instruction 5100.10L, Department of the Navy Safety Program (2021).

Missile launches over open water are also subject to U.S. Coast Guard and International Maritime Organization maritime safety standards and guidance, and Federal Aviation Administration and International Civil Aviation Organization regulations and guidance.

B.8.2.2 Kwajalein Atoll

USAKA, USAG-KA, and RTS are managed and operated by the U.S. Army. The U.S. Army adheres to internal health and safety standards and DoD standards. Specific regulations and procedures for maintaining a safe environment for personnel and the public are found in the following documents:

- DoD Directive 6055.09E, Explosives Safety Management (2019)
- DoD Instruction 4540.01, Use of International Airspace by U.S. Military Aircraft and for Missile and Projectile Firings (2017)
- DoD Instruction 6055.01, DoD Safety and Occupational Health Program (2014)
- DoD Instruction 6055.05, Occupational and Environmental Health (2018)
- DoD Instruction 6055.07, Mishap Notification, Investigation, Reporting, and Record Keeping (2018)
- Army Regulation 385-10, The Army Safety Program (2017)
- Army Regulation 385-63, Range Safety (2012)

Additionally, for the protection of public health and safety and the environment at USAKA, the UES (USASMDC 2024) specifies standards and procedures that apply to all activities of the U.S. Government that occur on USAG-KA/RTS controlled islands and within the Mid-Atoll Corridor, as well as all USAG-KA/RTS controlled activities within the RMI, including the territorial waters of the RMI. Under the UES, there are several Appropriate Agencies or their designated representatives that are given the opportunity to review and comment on the proposed actions at USAKA that relate to public health and safety and protection of the environment. The list of Appropriate Agencies includes USEPA, RMI Environmental Protection Authority, NMFS, USFWS, and the U.S. Army Corps of Engineers.

B.9. Cumulative Effects

B.9.1 Definition of Cumulative Effects

The approach taken in the analysis of cumulative effects follows the objectives of NEPA, Council on Environmental Quality regulations, and Council on Environmental Quality guidance. Cumulative effects are defined in 40 CFR § 1508.1 as, “effects on the environment that result from the incremental effects of the action when added to the effects of other past, present, and reasonably foreseeable actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time.” Current USEPA guidance states that cumulative effect analyses should “characterize the combined effects from exposures to both chemical and non-chemical stressors over time across the affected population group or community” (USEPA 2022a).

Cumulative effects are most likely to arise when a relationship or synergism exists between a Proposed Action and other actions expected to occur in a similar location or during a similar time period (DON and U.S. Army 2022). Actions overlapping with or in close proximity to the Proposed Action would be expected to have more potential for a relationship—and therefore a higher potential for cumulative effects—than those more geographically separated. Cumulative effects might be purely additive or may be interactive (when effects of an action change in type or magnitude depending on other actions or variables such that the combined effects would be greater than simply adding the effects). To identify cumulative effects, the analysis needs to address the following three questions:

- Does a relationship exist such that affected resource areas of the Proposed Action might interact with the affected resource areas of past, present, or reasonably foreseeable actions?
- If one or more of the affected resource areas of the Proposed Action and another action could be expected to interact, would the Proposed Action affect or be affected by impacts of the other action?
- If such a relationship exists, does an assessment reveal any potentially significant impacts not identified when the Proposed Action is considered alone?

B.9.2 Scope of Cumulative Effects Analysis

To determine the scope of environmental effects, agencies consider cumulative actions, which when viewed with other proposed actions have cumulatively significant impacts and should therefore be discussed in the same impact evaluation document.

The scope of analysis for cumulative effects is limited in time to the 10-year period over which the Navy would conduct up to eight CPS flight tests annually and limited geographically to the Pacific and Atlantic BOAs where at-sea launches would be conducted from several existing naval surface ships and submarines, where other smaller ships and watercraft would be used in support of the CPS flight tests downrange by hosting telemetry and radar to support target

placement and recovery operations, where floating targets would operate, and at designated target sites in established range operational areas; KMISS; and the land-based target site at Illeginni Islet.

Another factor influencing the scope of cumulative effects analysis involves identifying other past, present, and reasonably foreseeable actions to consider the interconnection between people and ecosystems at local, regional, and national levels (USEPA 2022a). Beyond determining that the geographic scope and time frame for the actions interrelate to the Proposed Action, the analysis employs the measure of “reasonably foreseeable” to include or exclude other actions. For the purposes of this analysis, public documents prepared by federal, state, and local government agencies form the primary sources of information regarding reasonably foreseeable actions. Documents used to identify other actions include EISs, EAs, management plans, land use plans, and other planning related studies.



C

Standard Operating
Procedures and
Mitigation Measures



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Appendix C. Standard Operating Procedures and Mitigation Measures

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This section includes a description of standard operating procedures and mitigation measures to be implemented for the Proposed Action. Standard operating procedures are designed to provide direction for the routine performance of safe and consistent operations in accordance with mission objectives for the Proposed Action. Mitigation measures are those tasks completed beyond standard operating procedures that are designed to avoid, minimize, rectify, reduce, or compensate for potential adverse effects to various environmental resources during implementation of the Proposed Action. Standard operating procedures are considered part of the Proposed Action. Since standard operating procedures often provide a benefit to environmental and cultural resources they are included in this appendix. The standard operating procedures and mitigation measures in the following sections are applicable to all locations and environmental resource areas, unless otherwise specified.

C.1. Air Quality

- There are no construction or demolition activities associated with the Proposed Action. Any mitigation requirements associated with flight test activities which would avoid or reduce potential impacts to air quality are listed under **Section C.6**, Hazardous Materials and Waste Management.

C.2. Cultural Resources

C.2.1 Kwajalein Atoll Standard Operating Procedures and Mitigation Measures

- No known cultural resources are located in the project area. Should previously unidentified cultural features be discovered during implementation of the Proposed Action, CPS personnel would follow procedures for the handling of such inadvertent discoveries outlined in the *Environmental Standards and Procedures for U.S. Army Kwajalein Atoll (USAKA) Activities in the Republic of the Marshall Islands, 17th Edition* (UES; USASMDC 2024).
- Project personnel would avoid activities that would negatively affect the National Register Cold War era properties located on the middle and eastern end of the islet.

C.3. Biological Resources

C.3.1 Broad Ocean Area Standard Operating Procedures and Mitigation Measures

This section includes the standard operating procedures and mitigation measures to be implemented as part of Navy CPS flight tests program activities in the BOAs. Some measures are specific to Navy CPS activities, others have been developed for routine Navy at-sea activities as part of previously evaluated at-sea training and testing programs. Since Navy vessels typically operating as part of these at-sea programs would be utilized for CPS flight

testing, relevant measures which would be implemented for those vessel operations are also included. Relevant to proposed CPS flight test activities are measures detailed in the Atlantic Fleet Training and Testing EIS/OEIS (Chapter 5 of DON 2018a), Hawaii–Southern California Training and Testing EIS/OEIS (Chapter 5 of DON 2018b), and the Mariana Islands Training and Testing Supplemental EIS/OEIS (Chapter 5 in DON 2020a). Navy mitigation measures and standard operating procedures within these Navy operational areas are centralized in the Navy’s “Protective Measures Assessment Protocol.” Navy policy requires applicable personnel to access the Protective Measures Assessment Protocol during the event planning process.

Because the Navy CPS weapon system is an experimental weapon system with unique characteristics compared to other Navy at-sea testing programs, the relatively small scale of the CPS flight tests program and design of the system allow for increased planning and flexibility in the time and location in which proposed activities can occur. During the testing phase of the CPS weapon system, there is a failure rate associated with testing activities that is not typically associated with routine at-sea training and testing programs. As a result, additional measures will be implemented to the greatest extent practicable to avoid effects to biological resources during launch, booster splashdown, and payload impact as detailed in the following standard operating procedures and mitigation measures.

Mitigations would be implemented as compatible with the purpose and need of the Proposed Action, more specifically if the implementation is safe, sustainable, and allows the Navy to continue meeting its mission requirements.

Standard Operating Procedures

- Vessel operations would not involve any intentional ocean discharges of fuel, toxic wastes, or plastics and other solid wastes that could potentially harm marine life.
- Vessel hulls would be periodically inspected and cleaned to reduce the risk of introduction or spread of invasive species.
- Test launches would be conducted at least 50 nm and up to 200 nm offshore.
- No launches or missile component splashdown would occur within marine national monuments or national marine sanctuaries located in the ocean study areas. No anchoring would occur within marine national monuments or national marine sanctuaries.
- Flight tests would be designed to avoid conducting launch activities and missile component splashdown within designated critical habitat for leatherback sea turtles (*Dermochelys coriacea*) or for Central America and Mexico Distinct Population Segments (DPSs) of humpback whales (*Megaptera novaeangliae*).
- Flight tests would be designed to avoid conducting launch activities and missile component splashdown within the areas identified as biologically important areas for sei whale (*Balaenoptera borealis*) feeding, minke whale (*Balaenoptera acutorostrata*)

feeding, or North Atlantic right whale (*Eubalaena glacialis*) migration in the Atlantic Ocean as identified in **Section 3.1.2.2**.

- CPS missile flight paths would be designed to avoid Bermuda in the Atlantic, Marcus Island in the Pacific, and any other populated islands.
- With the exception of target sites at Kwajalein Atoll, no missile components are expected to splash down or impact within territorial seas or non-U.S. EEZs.
- Stage 1 booster splashdowns would occur in deep ocean waters downrange from launch and as far as 330 nm offshore of any land areas.
- All stage 2 splashdown and payload target sites would be outside of EEZs in international waters.
- For the sea-based target sites in the BOA, support vessels would be present near the target site prior to, during, and after payload impact to observe the test and perform flight test activities.
- Support ship personnel would search for any visible floating test debris after payload impact. Any visible Common Hypersonic Glide Body (C-HGB) or other test debris found floating would be recovered, as much as practicable.
- Personnel aboard support vessels will survey the at-sea payload impact area for 30 minutes after impact to verify no injury to protected species (marine mammals and ESA-listed species). This measure can be done concurrently with debris retrieval.

Vessel Movement and Operations Mitigation Measures

- Surface ship launch platforms and other moving vessels will have a lookout on an observation platform to monitor mitigation zones, including 500 yards around the vessel for whales, 200 yards around the vessel for other marine mammals (except bow-riding dolphins), and within the vicinity for sea turtles. One or more trained lookouts would observe the mitigation zones and report observations to the watch station.
- If marine mammals or sea turtles are sighted in mitigation zones, the Navy would maneuver the vessel to maintain distance, until the animal is deemed to no longer be in the mitigation zone.
- Data would be collected for any marine mammal or ESA-listed species strike or injury due to Navy activities.
- If a marine mammal or ESA-listed species vessel strike occurs, the Navy will follow established incident reporting procedures.
- When within a 350-yard radius of live hard bottom, the Navy would not place anchors or mooring devices on the seafloor.

BOA Target Site Mitigation Measures

- A 2,500-yard mitigation zone around a target location will be established. Lookouts aboard support vessels shall monitor this zone for floating vegetation, marine mammals, and sea turtles to the best extent practical. If a marine mammal or sea turtle is spotted in the zone and communications are available with the launch platform, launch will be delayed by 30 minutes or until the animal is observed to leave the mitigation zone. Detailed commencement/recommencement conditions for Navy activities are detailed in Chapter 5 of DON 2018a, DON 2018b, and DON 2020a.
- Sightings of any marine mammal or ESA-listed species within the mitigation zone around the payload target location shall be reported to USFWS or NMFS.
- Data would be collected for any marine mammal or ESA-listed species strike or injury due to Navy activities.
- If a marine mammal or ESA-listed species strike occurs, the Navy will follow established incident reporting procedures.

C.3.2 Kwajalein Atoll Standard Operating Procedures and Mitigation Measures

Over time and through consultation with NMFS and USFWS for RTS test activities at USAKA, several standard avoidance, minimization, and mitigation measures have been developed to minimize the impacts of flight testing on protected species and their habitats. These measures, which would be implemented as part of the Proposed Action at Kwajalein Atoll, are very similar to those implemented for other recent test programs with payload impacts at Illeginni Islet and KMISS (U.S. Air Force 2021, DON 2019, U.S. Army 2021).

The following avoidance, minimization, and conservation measures would be implemented as part of the Proposed Action at USAKA to minimize the potential effects of the Proposed Action on UES-listed species and habitats:

Marine Mammal and Sea Turtle Monitoring

- During travel to and from payload impact zones, including Illeginni Islet, ship personnel would monitor for marine mammals and sea turtles to avoid potential ship strikes. Vessel operators would adjust speed or raft deployment based on the presence of special-status species and on lighting and turbidity conditions.
- A helicopter or fixed-wing aircraft overflight in the vicinity of the KMISS or Illeginni Islet impact area would be conducted during the week prior to the test and as close to launch as safely practical to survey for marine mammals and sea turtles. Any sightings or the lack of sightings would be recorded and reported according to procedures detailed below.
- Any marine mammals or sea turtle opportunistic sightings collected during ship travel, overflights, and deployment of sensor rafts in the vicinity of the Illeginni Islet or KMISS impact areas would be recorded and reported according to procedures detailed below.

- Pre-flight test monitoring by qualified personnel would be conducted on Illeginni Islet for sea turtles or sea turtle nests. For at least 8 weeks preceding the launch, Illeginni Islet would be surveyed weekly by pre-test personnel for sea turtles, sea turtle nesting activity, and sea turtle nests. If possible, personnel would inspect the area within days of the launch. Sea turtles or sea turtle nest observations near the impact area or the lack of observations would be recorded and reported according to procedures detailed below.
- Post-test overflights of the impact area would be conducted to survey for dead or injured cetaceans and sea turtles.
- Although unlikely, any dead or injured marine mammals or sea turtles sighted by project personnel would be reported immediately to the United States Army Space and Missile Defense Command (USASMDC) and the USAG-KA Environmental Office; USASMDC would as soon as possible, and within 24 hours, inform the RMI Environmental Protection Authority, NMFS, and USFWS. USAG-KA aircraft pilots or vessel operators otherwise operating in the vicinity of the impact and test support areas would also report any opportunistic sightings of dead or injured marine mammals or sea turtles through the procedures detailed below.
- For all surveys and incidental observations, data would be recorded including location, date, time, species, and number of individuals or reports of no sightings when animals are not seen on surveys. Observations would be reported to the USAG-KA Environmental Office, the RTS Range Directorate, the Flight Test Operations Director, and USASMDC. USASMDC and the USAG-KA Environmental Office would maintain records of these observations and USASMDC would distribute survey reports to the RMI Environmental Protection Authority, NMFS, and/or the USFWS within 6 months of completion of each fiscal year.

Hazardous Materials Measures

- Vessel and heavy equipment operators would inspect and clean equipment for fuel or fluid leaks prior to use or transport and would not intentionally discharge fuels or waste materials into terrestrial or marine environments.
- Any accidental spills from support equipment operations would be contained and cleaned up and all waste materials would be transported to Kwajalein Islet for proper disposal.
- Response to releases of oil, fuels, and lubricants into the USAKA environment would be in accordance with the Kwajalein Environmental Emergency Plan (UES § 3-6.5.8).
- All equipment and packages/materials shipped from the United States to RTS would be inspected prior to shipment and washed if necessary to prevent the introduction of animals, plants, and seeds.
- Following a land-impact test, soil and groundwater samples would be collected at various locations around the impact site and samples would be tested for metals (not limited to, but including arsenic, barium, cadmium, chromium, and lead). Testing results

exceeding the UES standards would trigger an immediate investigation of the soil on Illeginni Islet, as detailed in the UES § 3-6.5.8. Coordination would be initiated with the Defense Program, USASMDC, RMI Environmental Protection Authority, and the other UES Appropriate Agencies to determine the scope and methods/procedures to be followed during the investigation and any subsequent soil removal or other remediation activities.

- Following completion of a flight test at KMISS, a vessel or aircraft from USAG-KA would inspect the ocean impact area for any floating debris. Any visible debris found floating would be recovered, as much as practicable.

Reef Protection Measures

- To avoid impacts on coral heads in waters near Illeginni Islet, sensor rafts would be located in waters at least 10 ft deep.
- When feasible, within 1 day after the land impact test at Illeginni Islet, USAKA RTS environmental staff would survey the islet and the near-shore waters for any injured wildlife, damaged coral, or damage to sensitive habitats (i.e., reef habitat). Any impacts to biological resources would be reported to the UES Appropriate Agencies via USASMDC, with USFWS, RMI Environmental Protection Authority, and NMFS offered the opportunity to inspect the impact area to provide guidance on mitigations.
- If an inadvertent impact occurs on the reef, reef flat, or in shallow waters less than 10 ft deep, an inspection by project personnel would occur within 24 hours. Representatives from NMFS, USFWS, and RMI Environmental Protection Authority would be offered the opportunity to inspect the site as soon as practical after the test. The inspectors would assess any damage to coral and other natural and biological resources and, in coordination with RTS representatives, decide on any response measures that may be required.
- If any man-made debris were to enter the marine environment and divers were required to search for payload debris on the adjacent reef flat, they would be briefed prior to operations about coral fragility and provided guidance on how to carefully retrieve the very small pieces of payload debris that they would be looking for.
- In the event of a payload impact that affects the reef at Illeginni Islet, personnel would secure or remove from the water any substrate or coral rubble from the ejecta impact area that may become mobilized by wave action.
 - Ejecta greater than 6 inches in any dimension would be removed from the water or positioned such that it would not become mobilized by expected wave action, including replacement in the payload crater.
 - If possible, coral fragments greater than 6 inches in any dimension would be positioned on the reef such that they would not become mobilized by expected wave action and in a manner that would enhance their survival (i.e., away from fine sediments with the majority of the living tissue [polyps] facing up).

- UES consultation coral fragments that could not be secured in-place would be relocated to suitable habitat where they are not likely to become mobilized.
- In the event of a payload impact that affects the reef at Illeginni Islet, impacts on top shell snails and clams would be reduced.
 - Any living top shell snails or clams that are buried or trapped by rubble would be rescued and repositioned.
 - Any living top shell snails or clams that are in the path of any heavy equipment that must be used in the marine environment would be relocated to suitable habitat.

General Measures at Illeginni Islet

- Test personnel would be briefed on Best Management Practices and conservation requirements and the requirement to adhere to them during test activities.
- At Illeginni Islet, searches would be conducted for black-naped tern nests and chicks prior to any pre-test equipment mobilization. Any discovered nests in the action area would be flagged with a stake 3 ft from the nest to prevent disturbance. Prior to the test, nests in the impact area may be covered with A-frame structures as per current USFWS guidance.
- To prevent birds from nesting on support equipment after initial setup, the equipment would be appropriately covered with tarps or other materials and “scare” techniques (e.g., scarecrows, mylar ribbons, and/or flags) would be used on or near the equipment.
- When feasible, within 1 day after the land impact test at Illeginni Islet, USAKA RTS environmental staff would survey the islet and the near-shore waters for any injured wildlife or damage to sensitive habitats (i.e., sea turtle nesting habitat). Any impacts to biological resources would be reported to the UES Appropriate Agencies via USASMDC, with USFWS, RMI Environmental Protection Authority, and NMFS offered the opportunity to inspect the impact area to provide guidance on mitigations.
- In the event that any UES consultation species is found injured or killed, the finding would be recorded using digital photography. As practicable, digital photographic records would include (1) photographs of all damaged corals or other UES consultation species observed injured or dead, (2) include a scaling device (such as a ruler) in photographs to aid in the determination of size, and (3) the location of the photograph. Any photographs or records of injured or killed UES consultation species would be reported to USFWS, RMI Environmental Protection Authority, and NMFS via USASMDC within 60 days of completing post-test clean-up operations.
- Debris recovery and site cleanup would be performed for the land impact. To minimize long-term risks to marine life, all visible project-related man-made debris would be recovered during post-flight operations. In all cases, recovery and cleanup would be conducted in a manner to minimize further impacts on biological resources.

- During post-test recovery and cleanup, should personnel observe highly mobile endangered, threatened, or other species requiring consultation moving into the area, work would be delayed until such species are out of harm's way or leave the area of their own volition.
- Within 6 months of completion of each fiscal year, USASMDC would provide a report to NMFS, USFWS, and RMI Environmental Protection Authority. The report would identify: (1) the flight test and date; (2) the target site; (3) the results of the pre- and post-flight surveys; (4) the identity and quantity of affected UES consultation resources (include photographs and videos as applicable); and (5) the disposition of any relocation efforts.

C.4. Geology and Soils

C.4.1 Kwajalein Atoll Standard Operating Procedures and Mitigation Measures

- Prior to flight testing, the Action Proponents would prepare a detailed cleanup plan that satisfies human health and safety requirements and incorporates measures to minimize ocean pollution.
- Personnel would recover any visible floating debris from payload impact after the test and properly dispose of it. This would include the recovery of visible debris in shallow (less than 100 ft deep) ocean waters by range divers.
- Existing, relevant, accepted standard operating procedures and Best Management Practices would be followed.

Illeginni Islet

- Following a land-impact test, soil and groundwater samples at various locations around the impact site would be collected and tested for beryllium, depleted uranium as uranium, and other heavy metals (see UES Table 2-24.1 and Table 3-6B.1).
- Field duplicate (quality assurance/quality control) samples would be taken due to past heterogeneous sample results.
- Any soil testing results exceeding the UES standards would trigger an immediate investigation of the soil on Illeginni Islet, as detailed in the UES § 3-6.5.8. Coordination would be initiated with the Action Proponents, USAG-KA, USASMDC, and the UES Appropriate Agencies (RMI Environmental Protection Authority, USEPA – Region 9, U.S. Army Corps of Engineers, USFWS, NMFS).
- Following the soil investigation (see UES Section 3-6.5.8) required upon exceeding UES standards, USASMDC would transmit the records and reports of exceeded concentrations in soil to the RMI Environmental Protection Authority, NMFS, and USFWS within 2 weeks from the date of receipt of such records from the Action Proponent or analytical laboratory.
- All records associated with laboratory results and soil studies would be maintained for at least 5 years (UES § 2-14.2.4).

- In the event of a reentry vehicle impact that affects the reef, qualified personnel would secure or remove from the water any substrate or coral rubble from the ejecta impact zone that may become mobilized by wave action. Ejecta greater than 6 inches in any dimension would be removed from the water or positioned such that it would not become mobilized by expected wave action, including replacement in the payload crater.
- Any necessary dredge and fill activities would be carried out after consultations with UES Appropriate Agencies and USAG-KA. Best Management Practices include:
 - Authorized dredging and filling-related activities that may result in the temporary or permanent loss of aquatic habitats should be designed to avoid indirect, negative impacts to aquatic habitats beyond the planned project area.
 - Turbidity and siltation from project-related work should be minimized and contained within the project area by silt-containment devices and curtailing work during flooding or adverse tidal and weather conditions. Best Management Practices should be maintained for the life of the construction period until turbidity and siltation within the project area are stabilized. All project construction-related debris and sediment containment devices should be removed and disposed of at an approved site.
 - All project-related materials and equipment (dredges, vessels, backhoes, silt curtains, etc.) to be placed in an aquatic environment should be inspected for pollutants including, but not limited to grease, oil, and lubricant, etc. and appropriately cleaned to remove pollutants prior to use. Project-related activities should not result in any debris disposal to the affected or adjacent terrestrial or aquatic environments.
 - Project-related materials (fill, rock, etc.) and equipment should not be stockpiled in, or in close proximity to aquatic environments and should be protected from erosion (e.g., with filter fabric, etc.) to prevent materials from being carried into waters by wind, rain, or high surf.
 - All deliberately exposed soil or under-layer materials used in the project near water should be protected from erosion and stabilized as soon as possible with geotextile, filter fabric, or native or non-invasive vegetation matting, hydroseeding, etc.

C.5. Water Resources

C.5.1 Kwajalein Atoll Standard Operating Procedures and Mitigation Measures

- All materials placed in the water for temporary use would be removed as soon as possible after use or at the end of proposed activities.
- Following the Proposed Action, visible debris on the surface of the water would be recovered and disposed of according to UES standards.

Illeginni Islet

- Prior to returning the test support equipment and materials to the United States, the equipment would be washed, and a certified Pest Control Technician would inspect the equipment again to ensure that it does not contain any insects, animals, plants, or seeds that might have been picked up during fielding. Personnel would be judicious and not overwater, to ensure the freshwater would evaporate in place and not flow into the lagoon. This would prevent possible contamination from entering the marine environment.
- Following a land-impact test, soil and groundwater samples (with field duplicates) at various locations around the impact site would be collected and tested for beryllium, depleted uranium as uranium, and other heavy metals (see UES Table 2-24.1 and Table 3-6B.1).
- Any testing results exceeding the UES standards would trigger an immediate investigation of the media (soil or groundwater) on Illeginni Islet, as detailed in the UES § 3-6.5.8. Coordination would be initiated with the Action Proponents, USAG-KA, USASMDC, and the UES Appropriate Agencies (RMI Environmental Protection Authority, USEPA – Region 9, U.S. Army Corps of Engineers, USFWS, NMFS).
- Following any investigation required upon exceeding UES standards (for soil or groundwater, see UES § 3-6.5.8), USASMDC would transmit the records and reports of exceeded concentrations to the RMI Environmental Protection Authority, NMFS, and USFWS within 2 weeks from the date of receipt of such records from the Action Proponent or analytical laboratory.
- All records associated with laboratory results and studies would be maintained for at least 5 years (UES § 2-14.2.4).

C.6. Hazardous Materials and Waste Management

C.6.1 Kwajalein Atoll Standard Operating Procedures and Mitigation Measures

Illeginni Islet

- Prior to flight test activities, Illeginni Islet would be assessed to ensure all personnel are off-site prior to launch and exclusionary control (keeping personnel out of the impact zone) would be maintained until recovery actions are complete. Additionally, if needed, the Mid-Atoll Corridor would be cleared and monitored for unauthorized access prior to the flight test.
- Prior to debris recovery and cleanup actions on Illeginni Islet, unexploded ordnance personnel would first inspect the impact crater and surrounding area. Test support personnel would conduct an impact assessment and cleanup and recovery operations once the site is clear for safe entry.

- Following assessment of the impact area for safety, personnel would search for any visible debris. Visible C-HGB or other test debris would be recovered as much as practicable on land and if necessary in shallow waters (less than 180 ft deep)
- The impact area would be wetted with freshwater to stabilize the disturbed soil. The impact crater would be excavated using a backhoe or front-end loader transported to the islet, and the excavated material would be screened to recover debris.
- Following debris removal, the crater would be backfilled and, if necessary, repairs made to surrounding structures.
- Accidental spills from support equipment operations would be contained and cleaned up, in accordance with the UES Kwajalein Environmental Emergency Plan (UES § 3-6.4.1). All waste materials would be appropriately stored and returned to Kwajalein Island for proper disposal.

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- Following assessment of the splashdown area for safety, personnel would search for any visible floating debris. Any visible C-HGB or other test debris found floating would be recovered, as much as practicable.

C.7. Health and Safety

C.7.1 Broad Ocean Area Standard Operating Procedures

- A Notice to Air Missions and a Notice to Mariners are transmitted to appropriate authorities to clear commercial, private, and non-mission military vessel and aircraft traffic from caution areas ahead of any CPS flight test to inform the public of impending missions in which messages describe the time, the area affected, and safe alternate routes.

C.7.2 Kwajalein Atoll Standard Operating Procedures and Mitigation Measures

- A Notice to Air Missions and a Notice to Mariners are transmitted to appropriate authorities to clear commercial, private, and non-mission military vessel and aircraft traffic from caution areas ahead of any CPS flight test to inform the public of impending missions in which messages describe the time, the area affected, and safe alternate routes.
- A limited number of project personnel would access Illeginni Islet before the flight test to place equipment and after the test to recover the equipment and restore the impact site. No personnel would be on-island during the impact and any project personnel would be located offshore on ships or at other islands at the time of impact.

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D

Biological
Resources Detailed
Impact Analyses



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Appendix D. Biological Resources Detailed Impact Analyses

This section includes a detailed analysis of the environmental consequences of the Proposed Action for biological resources. Environmental consequences of the Proposed Action on biological resources are evaluated based on the best available information about species distributions in **Sections 3.1.2** and **3.2.3** and in the context of the regulatory setting discussed in **Appendix B, Section B.3**.

Determination of the significance of potential impacts to biological resources is based on (1) the importance of the resource (i.e., threatened or endangered species; critical habitats; recreationally, commercially, ecologically, culturally, or scientifically important species); (2) the sensitivity of the resource to proposed activities; (3) the proportion of the resource that would be affected relative to its occurrence in the region; and (4) the duration of ecological ramifications. For example, impacts to terrestrial wildlife would be considered significant if species or habitats of concern were substantially affected over relatively large areas or activities resulted in reductions in the population size or distribution that might limit the ability of a local or regional population to sustain itself. Impacts to environmentally sensitive habitats would be considered significant if these habitats were destroyed or substantially modified.

D.1. Environmental Consequences for Biological Resources – BOA

The Proposed Action has the potential to impact biological resources in the BOA ROI through exposure to elevated sound levels, direct contact from vehicle components, exposure to hazardous materials, and increased vessel activity. The following subsections describe the potential stressors for biological resources in the BOA ROI and the environmental consequences of those stressors on biological resources in the environment described in **Section 3.1.2**.

Because the Proposed Action is a Navy test action occurring primarily within existing Navy training and testing areas, proposed operations in the BOA would implement a number of standard operating procedures and mitigation measures, many of which were established in the Atlantic Fleet Training and Testing EIS/OEIS (Chapter 5 of DON 2018a), Hawaii-Southern California Training and Testing EIS/OEIS (Chapter 5 of DON 2018b), the Mariana Islands Training and Testing EIS/OEIS (Chapter 5 of DON 2020a), and the Point Mugu Sea Range EIS/OEIS (Chapter 5 of DON 2022a). **Appendix C, Section C.3.1** details the standard operating procedures and mitigation measures to be implemented to minimize the potential effects of the Proposed Action on biological resources.

Elevated Sound Levels

The Proposed Action would result in elevated sound levels both in air and in water. Sources of elevated sound levels in the BOA ROI would include the following:

- Launch of the CPS flight test vehicle from a naval vessel with maximum sound pressure of 150 decibels (dB) in air (referenced to [re] 20 micropascals [μPa]) at 50 ft from the launch. At its loudest level, launch noise would last less than a second, and launch noises as low as 95 dB might last up to 15 seconds at the launch site. Launches would occur at least 50 nm and up to 200 nm from land.
- Flight of the CPS vehicle over the ocean would generate a sonic boom with an average sound pressure level of 104 dB in air (re 20 μPa) at the ocean surface (130 dB in water [re 1 μPa] at the surface) and a duration of 0.27 seconds.
- Splashdown of the spent stage 1 boosters into the BOA would generate estimated maximum sound pressure levels of 218 dB in water (re 1 μPa) at the ocean surface. Stage 1 booster splashdown would occur downrange of launch and as far as 330 nm from land.
- Splashdown of the spent stage 2 boosters into the BOA would generate estimated maximum sound pressure levels of 201 dB in water (re 1 μPa) at the ocean surface. Stage 2 booster splashdown would occur outside EEZs in international waters.
- Impact of the payload would generate an estimated maximum sound pressure level of 191 dB in water (re 1 μPa) at the ocean surface. In the BOA, payload impact would occur in deep ocean waters outside EEZs.

An extensive discussion about the potential effects of elevated sound pressure levels on biological resources is included in the Atlantic Fleet Training and Testing EIS/OEIS (DON 2018a) and the Hawaii-Southern California Training and Testing EIS/OEIS (DON 2018b). This remains the best available information on the potential effects of proposed Navy training and testing acoustic stressors, including relevant effect thresholds for wildlife, and is incorporated here by reference.

Potential effects of elevated sound pressures on wildlife can be divided into three main categories: permanent injury (primarily auditory injury or permanent threshold shift but may be non-auditory injury for some groups), temporary hearing loss (temporary threshold shift), and behavioral reactions. To evaluate the potential impacts of elevated sound levels on wildlife, expected in-air and in-water sound pressures were compared to the effect thresholds for various categories of wildlife (i.e., birds, fish, sea turtles, phocid pinnipeds, otariid pinnipeds, and low-, mid-, and high-frequency hearing group cetaceans) (**Table D.1-1**). Where sound pressures would exceed potential effect thresholds, the distances within which thresholds might be exceeded were calculated using a point-source attenuation model (**Table D.1-1**). To evaluate the expected number of wildlife exposures to elevated sound pressures above effect thresholds, the number of animals expected to be within each potential effect area was calculated based on the best available information on species densities in the ROI when available. In the absence of reliable density data for the ROI, a qualitative assessment based on general animal abundance, distribution, and life history was used. A detailed description of the methodology for analyzing potential acoustic impacts can be found in the Navy CPS Weapon System Flight Tests Marine Biological Evaluation (DON and USASMDC 2024).

Based on expected sound pressure levels for launch, in-air sound pressures would only exceed the injury threshold for seabirds (140 A-weighted decibels) within 175 ft of launch. Seabirds, especially special status seabirds, are unlikely to be within this area. Launch noise might cause behavioral disturbance in seabirds near the launch vessel. However, any response to this short duration noise (no more than a few seconds) is expected to be limited to short-term startle reactions. Birds might flush or alter flight direction but would be expected to return to normal behaviors within minutes of launch.

Table D.1-1. Distance to Effect Thresholds in Wildlife for Elevated In-Water Sound Levels Resulting from CPS Component Splashdown or Impact

Functional Hearing Group	Effect Category	Threshold Criterion (re 1 µPa)	Radial Distance to Threshold from			
			Launch	Stage 1 Splashdown	Stage 2 Splashdown	Payload Impact
Low Frequency Cetaceans (<i>Balaenoptera</i> and <i>Megaptera</i> whales)	PTS (non-lethal injury)	219 dB _{peak}	-	-	-	-
	TTS	213 dB _{peak}	-	6 ft	-	-
Mid Frequency Cetaceans (<i>Delphinus</i> , <i>Grampus</i> , <i>Stenella</i> , and <i>Tursiops</i> dolphins; <i>Feresa</i> , <i>Globicephala</i> , <i>Mesoplodon</i> , <i>Orcinus</i> , <i>Peponocephala</i> , and <i>Physeter</i> whales)	PTS (non-lethal injury)	230 dB _{peak}	-	-	-	-
	TTS	224 dB _{peak}	-	-	-	-
High Frequency Cetaceans (<i>Kogia</i> whales and porpoises)	PTS (non-lethal injury)	202 dB _{peak}	-	21 ft	-	-
	TTS	196 dB _{peak}	-	41 ft	6 ft	-
Phocid Pinnipeds (monk seals)	PTS (non-lethal injury)	218 dB _{peak}	-	-	-	-
	TTS	212 dB _{peak}	-	7 ft	-	-
Otariid Pinnipeds (fur seals and sea lions)	PTS (non-lethal injury)	232 dB _{peak}	-	-	-	-
	TTS	226 dB _{peak}	-	-	-	-
All Marine Mammals	Behavioral Disturbance	160 dB _{RMS}	300 ft	2,606 ft	368 ft	116 ft
Sea Turtles	PTS (non-lethal injury)	232 dB _{peak}	-	-	-	-
	TTS	226 dB _{peak}	-	-	-	-
	Behavioral Disturbance	175 dB _{RMS}	4 ft	463 ft	65 ft	21 ft
Fish	Physical Injury	206 dB _{peak}	-	21 ft	-	-
	Behavioral Disturbance	150 dB _{RMS}	950 ft	8,241 ft	1,164 ft	367 ft

Sources: DON 2019, NOAA 2018, NMFS 2019, NMFS 2023

Acronyms and Abbreviations: µPa = micropascals, dB = decibels, ft = feet, PTS = Permanent Threshold Shift, RMS = root mean squared, TTS = Temporary Threshold Shift,
“-“ = threshold not exceeded

Based on modeled launch noise, in-water sound levels would not exceed the permanent threshold shift thresholds for any marine animal group (**Table D.1-1**). Sound pressures within several hundred feet of the launch vessel might be high enough to cause behavioral disturbance in marine mammals, sea turtles, and fish; however, no harm or harassment of special status marine animals is expected. Based on the best available estimated densities for special status wildlife in the ROI (**Tables D.1-2** and **D.1-3**) and the estimated distances within which effect thresholds might be exceeded (**Table D.1-1**), the number of marine mammal and sea turtle exposures to elevated sound pressures was calculated (**Tables D.1-2** and **D.1-3**) (see DON and USASMDC 2024 for detailed analysis methodology). Less than one animal exposure per year to launch sounds above the behavioral disturbance threshold would be expected for all marine mammals and sea turtle species (**Tables D.1-2** and **D.1-3**). These modeled maximum sound pressures are likely overestimates of sound intensity and likely lead to an overestimate of potential effects as the model does not account for the substantial sound attenuation at the air-water interface. At most, launch noise might cause startle reactions for more common wildlife (such as abundant schooling fish) at the surface near the vessel. As with birds, any reaction would be temporary and animals would be expected to return to normal behaviors within minutes.

Sound pressures generated from spent booster splashdown and payload impact may exceed the permanent and temporary threshold shift effect thresholds for dwarf and pygmy sperm whales (*Kogia* spp.) and porpoises but only within 21 and 41 ft, respectively, of stage 1 booster splashdown (**Table D.1-1**) (see DON and USASMDC 2024 for details). Stage 1 booster splashdown may also exceed the temporary threshold shift effect threshold for baleen whales (**Table D.1-1**) but only within 6 ft of booster splashdown. Based on the density of marine mammal and sea turtle species in the BOA the estimated number of animal exposures to elevated sound pressures above the permanent threshold shift and temporary threshold shift effect thresholds was calculated (**Tables D.1-2** and **D.1-3**). For all marine mammal species, the estimated number of permanent threshold shift and temporary threshold shift exposures would be substantially less than one animal annually and it is very unlikely that any marine mammals would be injured by elevated sound levels from component splashdown or impact in the BOA.

**Table D.1-2. Maximum Density and Estimated Number of Animal Exposures to Elevated Sound Pressure Levels
above Effect Thresholds for CPS Activities in the Atlantic BOA**

Common Name	Scientific Name	Launch Activities BOA		Stage 1 Splashdown BOA				Stage 2 Splashdown/Payload Impact BOA		
		Density ¹ (/km ²)	Annual Behavioral Disturbance Exposures	Density ¹ (/km ²)	Annual PTS Exposures	Annual TTS Exposures	Annual Behavioral Disturbance Exposures	Density ¹ (/km ²)	Annual TTS Exposures	Annual Behavioral Disturbance Exposures
Sea Turtles										
Hard shell turtles	<i>Chelonia mydas</i> and <i>Eretmochelys imbricata</i>	0.3183	<0.0001	0.3183	-	-	0.1596	0.3183	-	0.0035
Loggerhead turtle	<i>Caretta caretta</i>	0.4063	<0.0001	0.4063	-	-	0.2037	0.4063	-	0.0046
Leatherback turtle	<i>Dermochelys coriacea</i>	0.6371	<0.0001	0.6371	-	-	0.3195	0.6371	-	0.0070
Kemp's ridleys turtle	<i>Lepidochelys kempii</i>	0.0068	<0.0001	0.0068	-	-	0.0034	0.0068	-	0.0001
Cetaceans										
Minke whale	<i>Balaenoptera acutorostrata</i>	0.0466	<0.0001	0.0597	-	<0.0001	0.9462	0.0798	-	0.0281
Sei whale	<i>Balaenoptera borealis</i>	0.0319	<0.0001	0.0319	-	<0.0001	0.5062	0.0319	-	0.0112
Bryde's whale	<i>Balaenoptera edeni</i>	0.0000	<0.0001	0.0029	-	<0.0001	0.0458	0.0087	-	0.0030
Blue whale	<i>Balaenoptera musculus</i>	0.0020	<0.0001	0.0020	-	<0.0001	0.0319	0.0020	-	0.0007
Fin whale	<i>Balaenoptera physalus</i>	0.0960	0.0001	0.0685	-	<0.0001	1.0859	0.0123	-	0.0043
North Atlantic right whale	<i>Eubalaena glacialis</i>	0.1641	0.0002	0.0151	-	<0.0001	0.2389	0.0005	-	0.0002
Humpback whale	<i>Megaptera novaeangliae</i>	0.0214	<0.0001	0.0141	-	<0.0001	0.2230	0.0362	-	0.0128
Northern bottlenose whale	<i>Hyperoodon ampullatus</i>	0.0240	<0.0001	0.0170	-	-	0.2698	0.0004	-	0.0002
Beaked Whale Guild	Includes <i>Mesoplodon bidens</i> , <i>Mesoplodon densirostris</i> , <i>Mesoplodon europaeus</i> , <i>Mesoplodon mirus</i> , and <i>Ziphius cavirostris</i>	0	0	0.7183	-	-	11.3894	0.5237	-	0.1843
Short-beaked common dolphin	<i>Delphinus delphis</i>	1.2614	0.0013	0.7729	-	-	12.2555	0.8918	-	0.3139
Pygmy killer whale	<i>Feresa attenuata</i>	0.1201	0.0001	0.1137	-	-	1.8035	0.1294	-	0.0456
Pilot whales	<i>Globicephala macrorhynchus</i> and <i>Globicephala melas</i>	1.8820	0.0013	1.3311	-	-	21.1061	1.9152	-	0.6741

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Common Name	Scientific Name	Launch Activities BOA		Stage 1 Splashdown BOA				Stage 2 Splashdown/Payload Impact BOA		
		Density ¹ (/km ²)	Annual Behavioral Disturbance Exposures	Density ¹ (/km ²)	Annual PTS Exposures	Annual TTS Exposures	Annual Behavioral Disturbance Exposures	Density ¹ (/km ²)	Annual TTS Exposures	Annual Behavioral Disturbance Exposures
Cetaceans (continued)										
Risso's dolphin	<i>Grampus griseus</i>	1.8820	0.0019	1.3853	-	-	21.9656	0.2360	-	0.0831
Fraser's dolphin	<i>Lagenodelphis hosei</i>	0.2154	0.0002	0.2314	-	-	3.6695	0.2460	-	0.0866
Atlantic white-sided dolphin	<i>Lagenorhynchus acutus</i>	2.0805	0.0021	1.6722	-	-	26.5151	0.6620	-	0.2330
White-beaked dolphin	<i>Lagenorhynchus albirostris</i>	0.0014	<0.0001	0.0013	-	-	0.0199	0.0007	-	0.0002
Killer whale	<i>Orcinus orca</i>	0.0024	<0.0001	0.0024	-	-	0.0383	0.0024	-	0.0009
Melon-headed whale	<i>Peponocephala electra</i>	0.8504	0.0009	0.8009	-	-	12.6997	0.9170	-	0.3228
False killer whale	<i>Pseudorca crassidens</i>	0.1666	0.0002	0.1551	-	-	2.4594	0.1795	-	0.0632
Pantropical spotted dolphin	<i>Stenella attenuata</i>	6.3104	0.0063	6.0818	-	-	96.4336	2.7485	-	0.9675
Clymene dolphin	<i>Stenella clymene</i>	2.0375	0.0020	2.0003	-	-	31.7174	2.1666	-	0.7626
Striped dolphin	<i>Stenella coeruleoalba</i>	9.1372	0.0091	10.168	-	-	161.2252	3.6684	-	1.2913
Atlantic spotted dolphin	<i>Stenella frontalis</i>	2.1239	0.0021	2.9051	-	-	46.0628	2.6377	-	0.9285
Spinner dolphin	<i>Stenella longirostris</i>	1.5883	0.0016	1.4959	-	-	23.7195	1.7043	-	0.5999
Rough toothed dolphin	<i>Steno bredanensis</i>	0.3209	0.0003	0.2954	-	-	4.6842	0.3375	-	0.1188
Bottlenose dolphin	<i>Tursiops truncatus</i>	3.3984	0.0034	2.4298	-	-	38.5276	1.4938	-	0.5258
Harbor porpoise	<i>Phocoena phocoena</i>	0.0710	0.0001	0.0633	0.0001	0.0003	1.0033	0.0286	<0.0001	0.0101
Pygmy and dwarf sperm whales	<i>Kogia breviceps</i> and <i>Kogia sima</i>	0.3816	0.0004	0.3400	0.0003	0.0014	5.3906	0.2660	<0.0001	0.0936
Sperm whale	<i>Physeter macrocephalus</i>	1.0135	0.0010	0.9559	-	-	15.1560	0.4784	-	0.1684
Pinnipeds										
Seals (primarily gray and harbor)	<i>Halichoerus grypus</i> and <i>Phoca vitulina</i>	0.1020	0.0001	0.0622	-	-	0.9868	0.0048	-	0.0017

Acronyms and Abbreviations: BOA = Broad Ocean Area, km² = square kilometers, PTS = Permanent Threshold Shift, TTS = Temporary Threshold Shift, "-" = threshold not exceeded

Note: For Endangered Species Act listed species, density estimates are not specific to listed Distinct Population Segments but rather include animals from both listed and non-listed populations.

¹ Density estimates from the U.S. Navy's Marine Species Density Databases for the Atlantic Fleet Training and Testing Study Area (Roberts et al. 2023, DON 2017c).

Table D.1-3. Maximum Density and Estimated Number of Animal Exposures to Elevated Sound Pressure Levels
above Effect Thresholds for CPS Activities in the Pacific BOA

Common Name	Scientific Name	Launch Activities BOA		Splashdown/Payload Impact BOA				Splashdown/Payload Impact BOA		
		Density ¹ (/km ²)	Annual Behavioral Disturbance Exposures	Density ¹ (/km ²)	Annual PTS Exposures	Annual TTS Exposures	Annual Behavioral Disturbance Exposures	Density ¹ (/km ²)	Annual TTS Exposures	Annual Behavioral Disturbance Exposures
Sea Turtles										
Loggerhead turtle	<i>Caretta caretta</i>	0.2400	<0.0001	0.2400	-	-	0.1204	0.0018	-	<0.0001
Green turtle	<i>Chelonia mydas</i>	0.0003	<0.0001	0.0003	-	-	0.0001	0.0004	-	<0.0001
Leatherback turtle	<i>Dermochelys coriacea</i>	0.0020	<0.0001	0.0020	-	-	0.0010	0.0012	-	<0.0001
Hawksbill turtle	<i>Eretmochelys imbricata</i>	0.0001	<0.0001	0.0001	-	-	<0.0001	0.0001	-	<0.0001
Olive ridley turtle	<i>Lepidochelys olivacea</i>	0.0018	<0.0001	0.0018	-	-	0.0009	0.0018	-	<0.0001
Cetaceans										
Minke whale	<i>Balaenoptera acutorostrata</i>	0.0028	<0.0001	0.0028	-	<0.0001	0.0450	0.0028	-	0.0010
Sei whale	<i>Balaenoptera borealis</i>	0.0003	<0.0001	0.0003	-	<0.0001	0.0048	0.0003	-	0.0001
Bryde's whale	<i>Balaenoptera edeni</i>	0.0003	<0.0001	0.0003	-	<0.0001	0.0047	0.00059	-	0.0002
Blue whale	<i>Balaenoptera musculus</i>	0.0063	<0.0001	0.0063	-	<0.0001	0.0997	0.0014	-	0.0005
Omura's whale	<i>Balaenoptera omurai</i>	0	-	0	-	0	0	0.00004	-	<0.0001
Fin whale	<i>Balaenoptera physalus</i>	0.0821	0.0001	0.0821	-	<0.0001	1.3023	0.01600	-	0.0056
Gray whale	<i>Eschrichtius robustus</i>	0.00001	<0.0001	0.00001	-	<0.0001	0.0002	0.00001	-	<0.0001
North Pacific right whale	<i>Eubalaena japonica</i>	0.00001	<0.0001	0.00001	-	<0.0001	0.0002	0.00001	-	<0.0001
Humpback whale	<i>Megaptera novaeangliae</i>	0.0203	<0.0001	0.0203	-	<0.0001	0.3218	0.0080	-	0.0028
Baird's beaked whale	<i>Berardius bairdii</i>	0.0385	<0.0001	0.0385	-	-	0.6105	0.0005	-	0.0002
Longman's beaked whale	<i>Indopacetus pacificus</i>	0.0010	<0.0001	0.0010	-	-	0.0165	0.0031	-	0.0011
Beaked whale guild	Includes <i>Mesoplodon densirostris</i> , <i>Mesoplodon ginkgodens</i> , and <i>Mesoplodon stejnegeri</i>	0.0103	<0.0001	0.0103	-	-	0.1630	0.0067	-	0.0024
Cuvier's beaked whale	<i>Ziphius cavirostris</i>	0.0088	<0.0001	0.0088			0.1396	0.0088	-	0.0031

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Common Name	Scientific Name	Launch Activities BOA		Splashdown/Payload Impact BOA				Splashdown/Payload Impact BOA		
		Density ¹ (/km ²)	Annual Behavioral Disturbance Exposures	Density ¹ (/km ²)	Annual PTS Exposures	Annual TTS Exposures	Annual Behavioral Disturbance Exposures	Density ¹ (/km ²)	Annual TTS Exposures	Annual Behavioral Disturbance Exposures
Cetaceans (continued)										
Long-beaked common dolphin	<i>Delphinus capensis</i>	0.1267	0.0001	0.1267	-	-	2.0084	0.1267	-	0.0446
Short-beaked common dolphin	<i>Delphinus delphis</i>	1.7350	0.0017	1.7350	-	-	27.5102	1.7350	-	0.6107
Pygmy killer whale	<i>Feresa attenuata</i>	0.0042	<0.0001	0.0042	-	-	0.0666	0.0042	-	0.0015
Short-finned pilot whale	<i>Globicephala macrorhynchus</i>	0.0626	0.0001	0.0626	-	-	0.9919	0.0136	-	0.0048
Risso's dolphin	<i>Grampus griseus</i>	0.0399	<0.0001	0.0399	-	-	0.6322	0.0147	-	0.0052
Fraser's dolphin	<i>Lagenodelphis hosei</i>	0.0167	<0.0001	0.0167	-	-	0.2653	0.0210	-	0.0074
Pacific white-sided dolphin	<i>Lagenorhynchus obliquidens</i>	0.0756	0.0001	0.0756	-	-	1.1991	0.0249	-	0.0087
Northern right whale dolphin	<i>Lissodelphis borealis</i>	0.1565	0.0002	0.1565	-	-	2.4808	0.0447	-	0.0157
Killer whale	<i>Orcinus orca</i>	0.0050	<0.0001	0.0050	-	-	0.0793	0.0050	-	0.0018
Melon-headed whale	<i>Peponocephala electra</i>	0.0166	<0.0001	0.0166	-	-	0.2634	0.0166	-	0.0058
False killer whale	<i>Pseudorca crassidens</i>	0.0024	<0.0001	0.0024	-	-	0.0384	0.0024	-	0.0009
Main Hawaiian Islands Insular DPS		0.0006	<0.0001	0.0006			0.0090	0	-	0
Pantropical spotted dolphin	<i>Stenella attenuata</i>	0.0862	0.0001	0.0862	-	-	1.3671	0.0862	-	0.0303
Striped dolphin	<i>Stenella coeruleoalba</i>	0.1879	0.0002	0.1879	-	-	2.9801	0.1879	-	0.0662
Spinner dolphin	<i>Stenella longirostris</i>	0.0050	<0.0001	0.0050	-	-	0.0792	0.0050	-	0.0018
Rough-toothed dolphin	<i>Steno bredanensis</i>	0.2541	0.0003	0.2541	-	-	4.0288	0.0576	-	0.0203
Bottlenose dolphin	<i>Tursiops truncatus</i>	0.3612	0.0004	0.3612	-	-	5.7272	0.3612	-	0.1271
Dall's porpoise	<i>Phocoenoides dalli</i>	0.0981	0.0001	0.0981	<0.0001	0.0004	1.5550	0.0480	<0.0001	0.0169
Pygmy sperm whale	<i>Kogia breviceps</i>	0.0172	<0.0001	0.0172	<0.0001	0.0001	0.2726	0.0172	<0.0001	0.0061
Dwarf sperm whale	<i>Kogia sima</i>	0.0153	<0.0001	0.0153	<0.0001	0.0001	0.2426	0.0153	<0.0001	0.0054
Sperm whale	<i>Physeter macrocephalus</i>	0.0044	<0.0001	0.0150	-	-	0.2382	0.0150	-	0.0053

Common Name	Scientific Name	Launch Activities BOA		Splashdown/Payload Impact BOA				Splashdown/Payload Impact BOA		
		Density ¹ (/km ²)	Annual Behavioral Disturbance Exposures	Density ¹ (/km ²)	Annual PTS Exposures	Annual TTS Exposures	Annual Behavioral Disturbance Exposures	Density ¹ (/km ²)	Annual TTS Exposures	Annual Behavioral Disturbance Exposures
Pinnipeds										
Guadalupe fur seal	<i>Arctocephalus townsendi</i>	0.0628	0.0001	0.0628	-	-	0.9962	0.0628	-	0.0221
Northern fur seal	<i>Callorhinus ursinus</i>	0.2392	0.0002	0.2392	-	-	3.7928	0.1071	-	0.0377
Steller sea lion	<i>Eumetopias jubatus</i>	0.0098	<0.0001	0.0098	-	-	0.1554	0.0098	-	0.0034
Northern elephant seal	<i>Mirounga angustirostris</i>	0.1477	0.0001	0.1615	-	-	2.5607	0.1615	-	0.0568
Hawaiian monk seal	<i>Neomonachus schauinslandi</i>	0.00001	<0.0001	0.00003	-	-	0.0005	0	-	0
Harbor seal	<i>Phoca vitulina</i>	0.00001	<0.0001	0.00001			0.0002	0.00001	-	<0.0001
California sea lion	<i>Zalophus californianus</i>	1.6958	0.0017	1.6958	-	-	26.8886	0.00001	-	<0.0001

Acronyms and Abbreviations: BOA = Broad Ocean Area, km² = square kilometers, PTS = Permanent Threshold Shift, TTS = Temporary Threshold Shift, "-" = threshold not exceeded

Note: For Endangered Species Act listed species, density estimates are not specific to listed Distinct Population Segments but rather include animals from both listed and non-listed populations.

¹ Density estimates from the U.S. Navy Marine Species Density Database for the Hawaii-California Training and Testing Area (DON 2024), the U.S. Navy Marine Species Density Database for the Mariana Islands Training and Testing Area (DON 2018c), and data collected for the Gulf of Alaska Training and Testing Area (DON 2014, Rone et al. 2017).

For pilot whales, baleen whales, and harbor porpoises in the Atlantic BOA ROI the estimated number of animal exposures to sound pressures high enough to induce permanent threshold shift or temporary threshold shift would be substantially less than one (estimated number of exposures = 0.0019 individuals) per year for all species combined and for all test components. For all potential test events in a year, there would be a maximum one in 526 chance that an individual of any species might be exposed to sound pressures high enough to cause permanent or temporary threshold shift.

Based on estimated maximum densities for marine mammals in the Pacific ROI (**Table D.1-3**), the estimated number of animal exposures to sound pressures high enough to induce permanent threshold shift or temporary threshold shift would be substantially less than one (estimated number of exposures = 0.0006 individuals) per year for all species combined and for all test components. For all potential CPS test events in a year, there would be a maximum one in 1,570 chance that an individual of any species might be exposed to sound pressures high enough to cause permanent or temporary threshold shift.

Booster splashdown and payload impact would create sounds above the behavioral disturbance thresholds for many wildlife species (**Table D.1-1**). Marine mammals, sea turtles, and fish within several hundred feet might react briefly to splashdown noise. For marine mammals and sea turtles with reliable density data in the ROI, there is a chance that individual animals might be exposed to sounds above the behavioral disturbance effect threshold during a flight test (**Tables D.1-2 and D.1-3**). However, it is important to note that even if animals are exposed to sounds above the behavioral disturbance threshold, only a fraction would have the potential to respond to the sound (see DON and USASMDC 2024 and DON 2018a). Based on other studies, the probability of response to received sounds at 160 dB would be approximately 20% for baleen whales and 50% for toothed whales (DON 2018a). The probability of behavioral response would increase as sound intensity increased (DON 2018a) closer to the point of splashdown/impact. Some individual animals may respond to component splashdown and payload impact noise with behavioral modification. However, similar to other recent flight test programs, behavioral reactions are expected to be limited to short-term startle reactions and animals would return to normal behaviors within minutes of this short-duration (on the order of seconds) sound (NMFS 2019, NMFS 2021, DON and USASMDC 2024).

In summary, proposed flight test noise has limited potential to affect the behavior and hearing sensitivity of wildlife. Some of the louder sounds generated by proposed activities have the potential to physically injure or cause temporary auditory injury in some of the most common and widely distributed marine wildlife such as abundant species of pelagic fish. However, given the limited number of tests per year (maximum eight per year over 10 years) and the limited potential of flight test noise to affect wildlife, elevated sound pressures would not change the relative population size or distribution of any wildlife species. For special-status species (including marine mammals and sea turtles), which generally have low densities in the ROI (see **Tables D.1-2 and D.1-3**), the chances of animals being exposed to sound pressures high enough to cause physical injury are extremely low. Elevated sound levels might cause wildlife to quickly react, briefly altering their normal behavior, but wildlife are expected to return to normal

behaviors within minutes of the short duration sounds (NMFS 2019). No long-term behavioral effects or meaningful health effects are expected for any special-status species. The impacts of elevated flight test noise levels on wildlife, including special-status species, would be negligible to moderate.

Direct Contact

Biological resources in the BOA ROI may be affected by direct contact from test components entering marine habitats in the BOA including:

- The spent stage 1 boosters which would splash down in deep ocean waters of the Atlantic or Pacific BOA downrange of launch and as far as 330 nm from land.
- The spent stage 2 boosters which would splash down in deep ocean waters of the Atlantic or Pacific BOA outside EEZs in international waters.
- Impact of the CPS payload in the Atlantic or Pacific BOA. In the BOA, the payload would impact only in deep ocean waters outside EEZs.
- In the event of a flight test failure (see **Table 2.1.5-1**), the entire CPS AUR vehicle might splash down in deep ocean waters of the Atlantic or Pacific BOA at least 50 nm from land.

These falling components would enter marine habitats and have the potential to injure marine organisms. Direct contact from flight test components is not expected to have a discernable or measurable impact on benthic or planktonic invertebrates or vegetation because of their abundance and wide distribution. The potential exists, however, for impacts to larger vertebrates in the open ocean area, particularly those that must come to the surface to breathe (e.g., marine mammals and sea turtles) or that feed at the surface (e.g., seabirds).

Based on the expected dimensions of CPS vehicle components and the best available information on species density in the BOA, the number of expected marine mammal and sea turtle exposures to direct contact from falling vehicle components was calculated (**Tables D.1-4 and D.1-5**). The estimated number of exposures to direct contact was based on methodology for other test programs (DON and U.S. Army 2022, U.S. Army 2021, DON 2019, DON 2015a) where the probability of contact is calculated for four impact scenarios and averaged across scenarios. Detailed methodology for estimation of direct contact is available in the Flight Experiment-1 EA/OEA (DON 2017a) and the CPS Marine Biological Evaluation (DON and USASMDC 2024) and is incorporated by reference.

Species density data for the Atlantic ROI was obtained primarily from the Navy marine species density models for the Atlantic Fleet Training and Testing Area (Roberts et al. 2023, DON 2017c). Where spatial models were available, density data were averaged across the portion of the proposed CPS activity areas which overlapped the Atlantic Fleet training and testing area. Species density data for the Pacific BOA was obtained primarily from the Navy marine species density models for the Hawaii- California Training and Testing Area (DON 2024, DON 2017b), the U.S. Navy Marine Species Density Database for the Mariana Islands Training and Testing

Area (DON 2018c), and data collected for the Gulf of Alaska Training and Testing Area (DON 2014, Rone et al. 2017). Where Navy training and testing area models were available and overlapped proposed CPS activity areas, the maximum modeled density was determined for each area of overlap. The maximum density for a species in any portion of the ROI was then used to represent the density for the entire Atlantic or Pacific BOA. As a conservative approach, the maximum density across seasons was used which likely resulted in an overestimation of actual animal density in the ROI.

For all species with available density data in the Atlantic BOA, the estimated number of animal exposures to direct contact during a single test is substantially less than one for even the most common species (maximum is 0.0026 exposures for striped dolphins in the Atlantic BOA) (**Table D.1-4**). The chances of an individual of any marine mammal species being subject to direct contact during a single test in the Atlantic BOA is less than one in 480 and is less than 1 in 2,890 for sea turtle species. Even when summed across eight potential tests per year over 10 years, the estimated number of animal exposures is less than 0.17 for each marine mammal and sea turtle species. The estimated chances of a marine mammal being exposed to direct contact are extremely low and the impacts of direct contact on these species would be minor to non-existent.

For all species with available density data in the Pacific BOA, the estimated number of animal exposures to direct contact during a single flight test is substantially less than one for even the most common species (maximum is 0.0005 exposures for short-beaked common dolphins) (**Table D.1-5**). The chances of an individual of any marine mammal species being subject to direct contact during a single test in the Pacific BOA is less than one in 2,000. For sea turtles, the estimated number of animal exposures per test is 0.00003 for all species combined. This corresponds to a one in 33,000 chance of contacting a sea turtle during a flight test event. Even when summed across eight potential tests per year over 10 years, the estimated number of animal exposures is less than 0.04 for each marine mammal and sea turtle species. The estimated chances of a marine mammal or sea turtle being exposed to direct contact are extremely low and the impacts of direct contact on these species would be minor to nonexistent.

Reliable density estimates are not available for special status fish or seabird species in the BOA. However, if it is assumed that densities of special-status fish and seabird species in the ROI are similar to densities of marine mammals, it is very unlikely that special status fish or seabirds would be exposed to direct contact. Some more common and abundant pelagic fish species may have individuals which would be exposed to direct contact; however, direct contact would not change the regional population size or distribution of these common species due to their relatively large population sizes and wide-ranging distributions in the BOA. Overall, direct contact would have minor to no impact on marine wildlife in the ROI.

**Table D.1-4. Maximum Density and Estimated Number of Animal Exposures to Direct Contact
from CPS Components in the Atlantic BOA**

Common Name	Scientific Name	Maximum Density (/km²) ¹		Estimated Number of Exposures to Direct Contact	
		Stage 1 BOA	Stage 2/ Target Site BOA	Per Test	Per Year (8 Tests)
Sea Turtles					
Hard shell turtles	<i>Chelonia mydas</i> and <i>Eretmochelys imbricata</i>	0.3183	0.3183	7.34E-05	5.87E-04
Loggerhead turtle	<i>Caretta caretta</i>	0.4063	0.4063	9.21E-04	7.37E-03
Leatherback turtle	<i>Dermochelys coriacea</i>	0.6371	0.6371	1.79E-04	1.43E-03
Kemp's ridleys turtle	<i>Lepidochelys kempii</i>	0.0068	0.0068	1.34E-06	1.07E-05
Cetaceans					
Minke whale	<i>Balaenoptera acutorostrata</i>	0.0597	0.0798	4.42E-05	3.53E-04
Sei whale	<i>Balaenoptera borealis</i>	0.0319	0.0319	3.63E-05	2.90E-04
Bryde's whale	<i>Balaenoptera edeni</i>	0.0029	0.0087	5.40E-06	4.32E-05
Blue whale	<i>Balaenoptera musculus</i>	0.0020	0.0020	3.55E-06	2.84E-05
Fin whale	<i>Balaenoptera physalus</i>	0.0685	0.0123	5.14E-05	4.11E-04
North Atlantic right whale	<i>Eubalaena glacialis</i>	0.0151	0.0005	7.09E-06	5.67E-05
Humpback whale	<i>Megaptera novaeangliae</i>	0.0141	0.0362	2.56E-05	2.04E-04
Northern bottlenose whale	<i>Hyperoodon ampullatus</i>	0.0170	0.0004	5.04E-06	4.03E-05
Beaked Whale Guild	Includes <i>Mesoplodon bidens</i> , <i>Mesoplodon densirostris</i> , <i>Mesoplodon europaeus</i> , <i>Mesoplodon mirus</i> , and <i>Ziphius cavirostris</i>	0.7183	0.5237	2.54E-04	2.03E-03
Short-beaked common dolphin	<i>Delphinus delphis</i>	0.7729	0.8918	2.44E-04	1.95E-03
Pygmy killer whale	<i>Feresa attenuata</i>	0.1137	0.1294	3.52E-05	2.81E-04
Pilot whales	<i>Globicephala macrorhynchus</i> and <i>Globicephala melas</i>	1.3311	1.9152	6.57E-04	5.25E-03
Risso's dolphin	<i>Grampus griseus</i>	1.3853	0.2360	2.84E-04	2.28E-03
Fraser's dolphin	<i>Lagenodelphis hosei</i>	0.2314	0.2460	7.02E-05	5.61E-04
Atlantic white-sided dolphin	<i>Lagenorhynchus acutus</i>	1.6722	0.6620	3.51E-04	2.81E-03
White-beaked dolphin	<i>Lagenorhynchus albirostris</i>	0.0013	0.0007	3.01E-07	2.41E-06
Killer whale	<i>Orcinus orca</i>	0.0024	0.0024	1.32E-06	1.06E-05
Melon-headed whale	<i>Peponocephala electra</i>	0.8009	0.9170	2.55E-04	2.04E-03
False killer whale	<i>Pseudorca crassidens</i>	0.1551	0.1795	6.90E-05	5.52E-04
Pantropical spotted dolphin	<i>Stenella attenuata</i>	6.0818	2.7485	1.31E-03	1.05E-02
Clymene dolphin	<i>Stenella clymene</i>	2.0003	2.1666	5.54E-04	4.44E-03
Striped dolphin	<i>Stenella coeruleoalba</i>	10.1681	3.6684	2.08E-03	1.66E-02

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Common Name	Scientific Name	Maximum Density (/km ²) ¹		Estimated Number of Exposures to Direct Contact	
		Stage 1 BOA	Stage 2/ Target Site BOA	Per Test	Per Year (8 Tests)
Cetaceans (Continued)					
Atlantic spotted dolphin	<i>Stenella frontalis</i>	2.9051	2.6377	7.81E-04	6.24E-03
Spinner dolphin	<i>Stenella longirostris</i>	1.4959	1.7043	4.44E-04	3.55E-03
Rough toothed dolphin	<i>Steno bredanensis</i>	0.2954	0.3375	9.28E-05	7.42E-04
Bottlenose dolphin	<i>Tursiops truncatus</i>	2.4298	1.4938	6.73E-04	5.38E-03
Harbor porpoise	<i>Phocoena phocoena</i>	0.0633	0.0286	1.21E-05	9.69E-05
Pygmy and dwarf sperm whales	<i>Kogia breviceps and Kogia sima</i>	0.3400	0.2660	9.54E-05	7.63E-04
Sperm whale	<i>Physeter macrocephalus</i>	0.9559	0.4784	6.06E-04	4.85E-03
Pinnipeds					
Seals (primarily gray and harbor)	<i>Halichoerus grypus and Phoca vitulina</i>	0.0622	0.0048	9.99E-06	7.99E-05

Note: For Endangered Species Act listed species, density estimates are not specific to listed Distinct Population Segments but rather include animals from both listed and non-listed populations.

¹ Density estimates from the U.S. Navy's Marine Species Density Databases for the Atlantic Fleet Training and Testing Study Area (Roberts et al. 2023, DON 2017c).

**Table D.1-5. Maximum Density and Estimated Number of Animal Exposures to Direct Contact
from CPS Components in the Pacific BOA**

Common Name	Scientific Name	Maximum Density (/km ²) ¹		Estimated Number of Exposures to Direct Contact	
		Stage 1 BOA	Stage 2/ Target Site BOA	Per Test	Per Year (8 Tests)
Sea Turtles					
Loggerhead turtle	<i>Caretta caretta</i>	0.2400	0.0018	2.91E-05	2.32E-04
Green turtle	<i>Chelonia mydas</i>	0.0003	0.0004	7.65E-08	6.12E-07
Leatherback turtle	<i>Dermochelys coriacea</i>	0.0020	0.0012	4.47E-07	3.57E-06
Hawksbill turtle	<i>Eretmochelys imbricata</i>	0.0001	0.0001	1.13E-08	9.07E-08
Olive ridley turtle	<i>Lepidochelys olivacea</i>	0.0018	0.0018	3.64E-07	2.91E-06
Cetaceans					
Minke whale	<i>Balaenoptera acutorostrata</i>	0.0028	0.0028	1.79E-06	1.43E-05
Sei whale	<i>Balaenoptera borealis</i>	0.0003	0.0003	3.41E-07	2.73E-06
Bryde's whale	<i>Balaenoptera edeni</i>	0.0003	0.00059	4.11E-07	3.29E-06
Blue whale	<i>Balaenoptera musculus</i>	0.0063	0.0014	6.32E-06	5.06E-05
Omura's whale	<i>Balaenoptera omurai</i>	0	0.00004	1.34E-08	1.07E-07
Fin whale	<i>Balaenoptera physalus</i>	0.0821	0.01600	6.26E-05	5.01E-04
Gray whale	<i>Eschrichtius robustus</i>	0.00001	0.00001	1.23E-08	9.84E-08
North Pacific right whale	<i>Eubalaena japonica</i>	0.00001	0.00001	8.78E-09	7.03E-08
Humpback whale	<i>Megaptera novaeangliae</i>	0.0203	0.0080	1.37E-05	1.09E-04
Baird's beaked whale	<i>Berardius bairdii</i>	0.0385	0.0005	1.40E-05	1.12E-04
Longman's beaked whale	<i>Indopacetus pacificus</i>	0.0010	0.0031	1.19E-06	9.53E-06
Beaked whale guild	Includes <i>Mesoplodon densirostris</i> , <i>Mesoplodon ginkgodens</i> , and <i>Mesoplodon stejnegeri</i>	0.0103	0.0067	3.50E-06	2.80E-05
Cuvier's beaked whale	<i>Ziphius cavirostris</i>	0.0088	0.0088	4.22E-06	3.38E-05
Long-beaked common dolphin	<i>Delphinus capensis</i>	0.1267	0.1267	3.71E-05	2.96E-04
Short-beaked common dolphin	<i>Delphinus delphis</i>	1.7350	1.7350	5.11E-04	4.09E-03
Pygmy killer whale	<i>Feresa attenuata</i>	0.0042	0.0042	1.22E-06	9.76E-06
Short-finned pilot whale	<i>Globicephala macrorhynchus</i>	0.0626	0.0136	1.55E-05	1.24E-04
Risso's dolphin	<i>Grampus griseus</i>	0.0399	0.0147	9.46E-06	7.57E-05
Fraser's dolphin	<i>Lagenodelphis hosei</i>	0.0167	0.0210	5.52E-06	4.42E-05
Pacific white-sided dolphin	<i>Lagenorhynchus obliquidens</i>	0.0756	0.0249	1.49E-05	1.19E-04
Northern right whale dolphin	<i>Lissodelphis borealis</i>	0.1565	0.0447	3.09E-05	2.47E-04
Killer whale	<i>Orcinus orca</i>	0.0050	0.0050	2.73E-06	2.18E-05
Melon-headed whale	<i>Peponocephala electra</i>	0.0166	0.0166	4.96E-06	3.97E-05

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Common Name	Scientific Name	Maximum Density (/km²) ¹		Estimated Number of Exposures to Direct Contact	
		Stage 1 BOA	Stage 2/ Target Site BOA	Per Test	Per Year (8 Tests)
Cetaceans (continued)					
False killer whale	<i>Pseudorca crassidens</i>	0.0024	0.0024	9.99E-07	8.00E-06
Main Hawaiian Islands Insular DPS		0.0006	0	1.21E-07	9.66E-07
Pantropical spotted dolphin	<i>Stenella attenuata</i>	0.0862	0.0862	2.49E-05	1.99E-04
Striped dolphin	<i>Stenella coeruleoalba</i>	0.1879	0.1879	5.46E-05	4.37E-04
Spinner dolphin	<i>Stenella longirostris</i>	0.0050	0.0050	1.39E-06	1.11E-05
Rough-toothed dolphin	<i>Steno bredanensis</i>	0.2541	0.0576	4.78E-05	3.83E-04
Bottlenose dolphin	<i>Tursiops truncatus</i>	0.3612	0.3612	1.22E-04	9.80E-04
Dall's porpoise	<i>Phocoenoides dalli</i>	0.0981	0.0480	2.09E-05	1.67E-04
Pygmy sperm whale	<i>Kogia breviceps</i>	0.0172	0.0172	5.37E-06	4.30E-05
Dwarf sperm whale	<i>Kogia sima</i>	0.0153	0.0153	4.78E-06	3.83E-05
Sperm whale	<i>Physeter macrocephalus</i>	0.0150	0.0150	1.29E-05	1.03E-04
Pinnipeds					
Guadalupe fur seal	<i>Arctocephalus townsendi</i>	0.0628	0.0628	1.70E-05	1.36E-04
Northern fur seal	<i>Callorhinus ursinus</i>	0.2392	0.1071	4.67E-05	3.73E-04
Steller sea lion	<i>Eumetopias jubatus</i>	0.0098	0.0098	3.10E-06	2.48E-05
Northern elephant seal	<i>Mirounga angustirostris</i>	0.1615	0.1615	5.34E-05	4.28E-04
Hawaiian monk seal	<i>Neomonachus schauinslandi</i>	0.00003	0	4.41E-09	3.53E-08
Harbor seal	<i>Phoca vitulina</i>	0.00001	0.00001	2.61E-09	2.09E-08
California sea lion	<i>Zalophus californianus</i>	1.6958	0.00001	2.52E-04	2.02E-03

Acronyms and Abbreviations: BOA = Broad Ocean Area, DPS = Distinct Population Segment, km² = square kilometers

Note: For Endangered Species Act listed species, density estimates are not specific to listed Distinct Population Segments but rather include animals from both listed and non-listed populations.

¹ Density estimates from the U.S. Navy Marine Species Density Database for the Hawaii-Southern California Training and Testing Area (DON 2017b), the U.S. Navy Marine Species Density Database for the Mariana Islands Training and Testing Area (DON 2018c), and data collected for the Gulf of Alaska Training and Testing Area (DON 2014, Rone et al. 2017).

Hazardous Materials

Biological resources in the BOA ROI may be affected by exposure to hazardous materials entering marine habitats or by ingestion of debris from proposed activities in the BOA including:

- Exposure to materials of which the spent stage 1 and stage 2 boosters are composed or are contained within the boosters (see **Table 2.1.1-1**). The propellant would be consumed during the flight tests; therefore, only a minimal residual amount of propellant would enter the ocean. All durable materials of which the boosters are composed or that are contained within the boosters are expected to sink to the ocean bottom. Booster splashdown would occur within deep ocean waters downrange from launch and as far as 330 nm from any land area.
- Exposure to materials of which the spent CPS payload is composed or are contained within the payload (see **Table 2.1.1-2**). All durable materials of which the payloads are composed or that are contained within the payload are expected to sink to the ocean bottom. Payload impact would occur within deep ocean waters outside EEZs in international waters. Support ships would retrieve instrumentation rafts and search for any floating debris at the payload impact site. Any visible debris found floating would be recovered, as much as practicable.
- For tests using a floating target raft, the raft is expected to remain relatively intact and floating. Little to no floating debris would be expected and any visible debris found floating would be collected for disposal as much as practicable. It is not planned or expected that the target raft would be sunk during Navy CPS flight test activities.

Hazardous material release in the BOA is not likely to adversely impact marine biological resources. Any hazardous material introduced into the BOA is not expected to have a discernable or measurable impact on benthic or planktonic invertebrates or vegetation because of their abundance, their wide distribution, and the protective influence of the mass of the ocean around them. The potential exists, however, for larger vertebrates in the open ocean area to be exposed, particularly those that must come to the surface to breathe (e.g., marine mammals and sea turtles) or that feed at the surface (e.g., seabirds).

Some of the chemicals contained in the spent boosters and payload are potentially harmful to marine wildlife at higher concentrations; however, rapid dilution of these chemicals would occur and toxic or harmful concentrations of these chemicals are unlikely to be encountered by larger vertebrates, including special-status species. The area affected by the dissolution of chemicals would be relatively small because of the size of the launch vehicle components and the minimal amount of residual materials they contain (see also **Section 4.2.1.3**). Any chemicals introduced to the water column would be quickly diluted and dispersed and components would sink to the ocean bottom. Most wildlife, including special-status wildlife are not likely to come into contact with test components or with chemicals at concentrations that could harm them. Any delayed release of chemicals from test components would occur in deep ocean waters and would be quickly diluted to low concentrations which would not cause harm to marine wildlife. Wildlife are unlikely to ingest or become entangled in components because they are expected to sink to the deep ocean floor where most species and their prey are not likely to occur. Due to the low

density and patchy distribution of special-status species in the BOA, the likelihood of an animal coming into contact with hazardous materials or chemicals in concentrations high enough to cause harm would be extremely low.

Hazardous materials would have negligible to minor impacts on biological resources in the Atlantic BOA ROI.

Vessel Movement

The Proposed Action would involve vessel movement in the BOA for approximately up to 4 weeks for each flight test including:

- Operation of surface ships and submarines as sea-based launch platforms.
- Operation of two to three support ships for downrange sensor coverage.
- Operation of one support ship and smaller watercraft for downrange target placement, clean-up activities, and recovery operations.
- Deployment and operation of up to 12 self-stationing instrumented sensor rafts around the targeted site for sensor coverage and data collection. No anchoring systems would be used for self-stationing rafts and rafts would remain on-station for several hours.
- For flight tests involving a floating target raft, the raft would be deployed from a support ship prior to the flight test and would remain on-station for several hours using small electric motors. No anchoring system would be used for target rafts.

All vessels used as part of proposed activities would operate in accordance with a number of standard operating procedures and vessel movement mitigation measures (see **Appendix C, Section C.3.1**). These standard operating procedures and mitigation measures include lookouts for marine mammals and sea turtles within defined mitigation zones and response measures to avoid potential vessel strikes. No vessel equipment is expected to pose an entanglement risk for wildlife.

Proposed vessel movement has the potential to increase strike risk for marine wildlife, especially wildlife which must surface to breathe (i.e., sea turtles and marine mammals). This risk is greatest for relatively slow-moving species and has the greatest potential for adverse impacts to special status species such as large marine mammals and sea turtles. Because Proposed Action vessel operation would only occur over a short period of time (up to 4 weeks) for each test and because these vessels are routinely used in the BOA as part of other DoD programs, the use of these vessels would not meaningfully increase vessel traffic in the BOA. The self-stationing rafts and target rafts would be slow moving and powered by small battery-powered trolling motors; therefore, the rafts would pose very little strike risk for wildlife. With implementation of standard operating procedures and mitigation measures for vessel movement, special-status marine wildlife are unlikely to be struck by vessels operating for the Proposed Action. Vessel movement as a result of the Proposed Action would have minor to no impacts on marine biological resources in the BOA.

Consequences for Special Status Wildlife

Threatened and Endangered Species. Pursuant to the ESA, the Navy has evaluated the potential effects of the Proposed Action on ESA listed species, candidate species, and designated critical habitats in a CPS Marine Biological Evaluation (DON and USASMDC 2024). The Navy has concluded that proposed activities in the BOA would have *no effect* on ESA-listed birds and *may affect but are not likely to adversely affect* ESA-listed species of marine mammals, sea turtles, and fish in the Atlantic and Pacific BOAs (see **Table 3.1.2-1**). The Navy consulted with NMFS on the potential effects of the Proposed Action under Section 7 of the ESA and NMFS concurred that proposed activities were not likely to adversely affect ESA-listed species in the BOA (NMFS 2024b).

Marine Mammal Protection Act. The Navy has concluded that proposed activities, including noise, would not result in take of marine mammal species in the ROI. The chances of any marine mammal being harmed by elevated sound levels, direct contact, hazardous materials, or vessel strike are extremely low. If any effects of proposed flight test noise on marine mammals were realized, they would be expected to be limited to short-duration startle response with no lasting or physiologically meaningful effects. Proposed activities are not expected to cause any disturbance to marine mammals which would result in abandonment or significant alteration of behavioral patterns. Therefore, there would be no harassment of marine mammals. The chances of direct contact from test components are extremely low (**Tables D.1-4 and D.1-5**) and no animals are expected to be injured from direct contact, hazardous materials, or vessel strike.

Migratory Bird Treaty Act. The Navy has concluded that proposed activities would not result in any incidental take that might result in a significant adverse effect on the sustainability of a population of a migratory bird species protected under the Migratory Bird Treaty Act in the Atlantic or Pacific BOA ROI.

Consequences for Environmentally Sensitive Habitats

The primary ways that the Proposed Action might impact environmentally sensitive habitats is through introduction of hazardous materials or by direct contact from test components or target debris. Almost all of the environmentally sensitive habitats in the BOAs are in coastal, shelf, or slope areas where almost no proposed activities would occur. Proposed activities would include implementation of a number of standard operating procedures and mitigation measures to minimize effects to biological resources (**Appendix C, Section C.3**). Vessels may transit some biologically important areas in the BOA but would not change the quality or quantity of those habitats for marine species. Some submarine canyons and seamounts occur in the BOAs; however, test activities are not likely to impact the quality or quantity of these habitats in the ROI. The following discussions focus on environmentally sensitive habitats which have regulatory protections.

Critical Habitat. The Proposed Action *may affect but is not likely to adversely affect* designated *Sargassum* critical habitat for loggerhead turtles, proposed *Sargassum* critical habitat for green turtles, designated critical habitat for the Central America DPS and Mexico DPS of humpback whales, and leatherback sea turtle critical habitat (DON and USASMDC 2024). With the

exception of designated or proposed *Sargassum* critical habitat, critical habitats would not be subject to any launch activities, booster splashdown, or payload impact. While vehicle launch and spent stage 1 booster splashdown may occur within designated or proposed *Sargassum* critical habitat, hazardous materials and debris would not change the features necessary for sea turtle conservation and is not likely to adversely affect these critical habitats. Vessel activity might also occur within critical habitat areas. All vessel operations would be conducted with standard operating procedures and mitigation measures in place (**Appendix C, Section C.3.1**), many of which are similar to those developed for routine Navy at-sea training and testing activities (DON 2018a, DON 2018b, DON 2020a). The Navy consulted with NMFS on the potential effects of the Proposed Action on critical habitats under Section 7 of the ESA as described for threatened and endangered species above.

Essential Fish Habitat. Only vehicle launch from launch-platform vessels and stage 1 booster splashdown might occur within EFH and designated habitat areas of particular concern. All vessel operations related to the Proposed Action would be conducted with standard operating procedures and mitigation measures in place (**Appendix C, Section C.3.1**) similar to those used for routine Navy at-sea training and testing (DON 2018a, DON 2018b, DON 2020a), including prohibitions on anchoring within a 350-yard radius of live hard bottom. Navy CPS at-sea launch activities would not introduce any materials into the ocean or otherwise affect marine habitats. Stage 1 booster splashdown may occur within EFH but would not significantly reduce the quality and/or quantity of EFH. The Proposed Action may have negligible impacts on EFH in the Hawaiian Islands EEZ. The Navy consulted with NMFS Pacific Islands Regional Office on the potential effects of the Proposed Action on EFH in the Hawaiian Islands EEZ (see **Appendix E, Sections E.2.9 through E.2.12**).

Marine National Monuments and Sanctuaries. The marine national monuments and national marine sanctuaries in the study area all occur within the U.S. EEZ. During flight test planning, marine national monuments and sanctuaries would be considered and no booster splashdown or payload impact would occur there. Only vessel operations might occur within the monuments but even then, no launch activities or anchoring are planned to occur within the monuments. The Proposed Action would not result in destruction or disturbance of any sanctuary or monument resources and no materials would be abandoned in these areas. The Proposed Action would have no effect on marine national monuments or national marine sanctuaries.

D.2. Environmental Consequences for Biological Resources – Kwajalein Atoll

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The Proposed Action has the potential to impact biological resources in the Kwajalein Atoll ROI through exposure to elevated sound levels, direct contact from payload impact and ejecta, exposure to hazardous materials, and increased human activity and equipment operation. The following subsections describe the potential stressors for biological resources in the Kwajalein Atoll ROI and the environmental consequences of those stressors on biological resources in the environment described in **Section 3.2.3**.

Over time and through consultation with NMFS and USFWS for RTS test activities at USAKA, several standard operating procedures and mitigation measures have been developed to minimize the impacts of flight testing on protected species and their habitats. The measures which would be implemented as part of the Proposed Action at Kwajalein Atoll (listed in **Appendix C, Section C.3.2**) are very similar to those implemented for other recent test programs with payload impacts at Illeginni Islet and KMISS (U.S. Air Force 2021, DON 2019, U.S. Army 2021). **Appendix C, Section C.3.2** summarizes the relevant and important standard operating procedures and mitigation measures to be implemented to minimize the potential effects of the Proposed Action on biological resources.

Elevated Sound Levels

The Proposed Action would result in elevated sound levels in air and in water at Kwajalein Atoll. Sources of elevated sound levels in the ROI would include:

- Payload impact on land at Illeginni Islet or the deep ocean waters of KMISS with a maximum sound pressure of 165 dB in air (re 20 μ Pa) at the impact site or 191 dB in water (re 1 μ Pa) at the ocean surface. Duration of impact noise would be on the order of seconds. Payload impact within KMISS would take place only within deep ocean waters. Up to one test per year might involve land impact at Illeginni Islet.
- Flight of the payload would generate a sonic boom with estimated maximum sound pressure levels of 149 dB in air (re 20 μ Pa) at the surface near payload impact. The duration of elevated noise levels would be 0.27 seconds.

The potential effects of elevated sound levels on wildlife, effect thresholds, and analysis methods are discussed in **Section D.1** and in detail in the CPS Biological Assessment (DON and USASMDC 2023). Expected in-air sound pressures were compared to the in-air effect thresholds for wildlife at payload impact sites and the area where sounds would exceed a threshold were calculated using a point-source attenuation model (**Table D.2-1** and **Table D.1-1**).

For birds, the current threshold standard for permanent threshold shift is 140 A-weighted decibels for impulsive sounds (CALTRANS 2016). There are no data available on temporary threshold shift thresholds in birds (CALTRANS 2016). Any elevated sound pressure levels, especially above ambient noise levels, have the potential to cause behavioral and/or physiological effects in birds (CALTRANS 2016). Behavioral responses to elevated sound pressure levels in birds include behaviors such as alert behavior, startle response, avoidance behavior, and changes in vocalization (CALTRANS 2016). However, there is some evidence that certain birds may acclimate or become habituated to noises after frequent exposure and cease to respond behaviorally (CALTRANS 2016). A 93 A-weighted decibels threshold for masking effects from continuous noise sources has been suggested as a conservative estimate of behavioral effects in birds (CALTRANS 2016).

Table D.2-1. Distance to Effect Thresholds in Wildlife for Elevated In-Air Sound Levels Resulting from CPS Payload Impact on Land

Functional Hearing Group	Permanent Threshold Shift		Temporary Threshold Shift		Behavioral Disruption	
	Threshold (dB SPL _{peak})	Radial Distance to Threshold from Payload Impact in feet	Threshold (dB SPL _{peak})	Radial Distance to Threshold from Payload Impact in feet	Threshold (dB SEL)	Radial Distance to Threshold from Payload Impact in feet
Birds	140 dBA	58	Unknown	Unknown	93 dB	13,061

Sources: DON and USASMD 2023, DARPA 2020, CALTRANS 2016

Acronyms and Abbreviations: dB = decibels, dBA = A-weighted decibels, SEL = Sound Exposure Level, SPL = Sound Pressure Level, “-” = threshold not exceeded

Note: All sound pressures in this table are in dB SPL_{peak} referenced to 20 micropascals (re 20 µPa) unless indicated.

Based on expected sound pressure levels for payload impact, sound pressures may exceed the physical injury threshold for birds up to 58 ft from payload impact and the temporary threshold shift threshold for fish up to 6 ft. Payload impact noise levels would exceed the behavioral disturbance threshold for birds and marine wildlife up to several thousand feet from payload impact.

Deep Offshore Waters. Marine mammals, sea turtles, and fish in Illeginni Islet offshore waters and the deep waters of KMISS might be exposed to elevated noise levels resulting from sonic booms and payload impact. The expected sound pressures would not exceed the permanent or temporary threshold shift thresholds for marine mammals or sea turtles. Sound pressure levels would exceed the injury threshold in fish but only within 6 ft of impact. Some marine mammals, sea turtles, and fish may be exposed to Proposed Action noise levels loud enough to cause behavioral disturbance; however, animal densities are likely to be very low in the ROI and the noise would be a very short duration (less than a second) single event. Any effects on marine mammals, sea turtles, or fish would likely be limited to short-term startle reactions, and animals would be expected to return to normal behaviors within minutes. No harm or harassment of special-status species, including marine mammals, is expected due to proposed elevated sound pressure levels. The impacts of elevated flight test noise levels on marine wildlife would be negligible to minor.

Illeginni Islet. Elevated noise levels from sonic booms and payload impact have the potential to cause short-term behavioral response such as temporary startle reactions in birds on Illeginni Islet. Birds roosting, foraging, or nesting in the area near the impact zone may be exposed to flight test noise above the behavioral disturbance threshold for birds. While birds may be more sensitive to elevated sound pressure level disturbance during certain nesting stages (DON 2015a), previous observations of birds on Illeginni Islet after a payload impact test indicate that even birds close to the impact site (213 to 328 ft) return to normal behaviors soon after a test (Foster and Work 2011, DON 2019). Even during the nesting season, short-duration elevated noise levels at Illeginni Islet are not expected to cause birds to abandon nests (DON 2019). Flight test noise levels have the potential to exceed the physical injury threshold in birds but only over a very small area (58 ft from the point of impact) centered on the disturbed habitats of the payload impact site. Mitigation measures will be implemented for the Proposed Action to deter

birds from nesting and roosting in the impact site (see **Appendix C, Section C.3.2**); therefore, it is unlikely that birds would be injured from elevated flight test noise levels (DON 2019). Elevated noise levels as a result of the Proposed Action would have negligible to minor impacts on birds (including UES coordination species) at and near Illeginni Islet.

Suitable sea turtle haulout and nesting habitat exists on the northwestern and eastern beaches of Illeginni Islet (see **Figure 3.2.3-1**). However, the last known sea turtle nest pits on Illeginni Islet were recorded in 1996 on the northern tip of the islet (DON 2019). No sea turtle nests or nesting activity have been observed on Illeginni Islet in over 25 years (DON 2019). While green and hawksbill turtles are known to use the nearshore waters of Illeginni Islet, it is considered very unlikely that sea turtles will haul out or nest on Illeginni Islet. Even though sea turtles are not likely to occur on Illeginni Islet, mitigation measures would be employed to further decrease the chances of there being effects on sea turtles or sea turtle nests including pre-test surveys for sea turtles, sea turtle nesting activity, and sea turtle nests (see **Appendix C, Section C.3.2**). Because sea turtles are unlikely to occur in terrestrial habitats on Illeginni Islet and because protective mitigation measures would be in place, sea turtles on land and sea turtle nests would not be impacted by the Proposed Action on Illeginni Islet.

In summary, proposed flight test noise has limited potential to affect the behavior and hearing sensitivity of wildlife. Some of the louder sounds generated by proposed activities have the potential to physically injure or cause temporary auditory injury in some of the most common and widely distributed marine wildlife. However, given the limited number of tests per year (maximum eight per year terminating at USAKA) and the limited potential of flight test noise to affect wildlife, elevated sound pressures would not change the relative population size or distribution of wildlife. For special-status species, the chances of animals being exposed to sound pressures high enough to cause physical injury are extremely low given the distribution and abundance of these species. Elevated sound levels might cause wildlife to quickly react, briefly altering their normal behavior, but wildlife are expected to return to normal behaviors within minutes of the short duration sounds. No long-term behavioral effects or meaningful health effects are expected. The impacts of elevated flight test noise levels on wildlife, including special-status species would be negligible to moderate.

Direct Contact

Biological resources in the Kwajalein Atoll ROI may be affected by direct contact from test components or impact ejecta. Sources or direct contact risks at USAKA include:

- Impact of the CPS payload in the deep ocean waters of KMISS. There would be a maximum of eight payload impacts per year at KMISS.
- Payload impact on land on Illeginni Islet. Based on payload impacts from previous test programs, payload impact would likely form a crater approximately 20 to 30 ft in diameter and 7 to 10 ft deep. The Navy anticipates a maximum of one payload impact per year on Illeginni Islet.

- Payload impact on land at Illeginni Islet would cause debris and soil to be ejected from the point of impact. Debris and ejecta might cover an area extending 200 to 300 ft from the point of impact. The density of debris and ejecta would be expected to decrease with increasing distance from the point of impact.
- Payload impact on land at Illeginni Islet may generate ground borne shockwaves which might be strong enough to damage corals out as far as 123 ft from the point of impact.

Deep Offshore Waters. In the KMISS area, the payload would impact in deep ocean waters. As for other test programs with a similar payload (U.S. Army 2021, DON 2019), a direct contact area of 300 ft was used as a conservative (largest possible) contact area to account for any fragmentation of the payload upon impact. Direct contact from payload debris is not expected to affect marine wildlife in the deepwater impact zone at KMISS. For marine mammals and sea turtles with the potential to occur in the deep ocean waters near Kwajalein Atoll the number of exposures to direct contact was calculated based on the best available estimates of species density in the region (DON 2019). The estimated number of exposures would be substantially less than one (maximum 0.0005 exposures for spinner dolphins) for all species (see Table 4-7 in DON 2019). While density information for special status fish and for seabird species is not available for the ROI, most species are expected to have very low densities in the deep offshore waters of Kwajalein Atoll and direct contact from payload debris is considered very unlikely (DON 2019). While individuals of some more common species of fish and invertebrates may be contacted by payload fragments, loss of these individuals would not meaningfully change the population size or distribution of these species at Kwajalein Atoll. Direct contact from payload impact or debris would have negligible impacts on marine wildlife in deep waters of the ROI.

Illeginni Islet. At Illeginni Islet, the payload as well as impact debris and ejecta have the potential to injure terrestrial organisms within the designated impact site (see **Figure 3.2.3-1**). While no nearshore or reef payload impact is planned or expected, analysis of the potential effects of payload impacts at Illeginni Islet in this section considers a worst-case scenario of a shoreline strike when evaluating the potential impacts to marine biological resources. Detailed analyses of the methodology used to estimate the effects of direct contact can be found in the Marine Biological Assessment for Navy CPS Flight Tests (DON and USASMDC 2024).

Because the land impact site is regularly used for DoD testing and vegetation around the helipad areas is managed, vegetation at the impact site is highly disturbed and unlikely to be negatively impacted by proposed activities. No protected vegetation species occurs within the land impact site. Some bird nesting habitat occurs within the impact site; however, this suitable bird nesting habitat is in managed vegetation. The land impact site has been regularly used for training and testing activities for decades and the habitat continues to be suitable for bird nesting. Similarly, proposed activities are not expected to destroy or alter beach habitats suitable for sea turtle nesting. Proposed activities would not change the conditions that have shaped baseline habitat conditions at the site. Direct contact would have minor to moderate impacts on terrestrial vegetation and wildlife habitats.

Birds in and near the payload impact site have the potential to be affected by direct contact. Some black-naped terns have the potential to nest in the impact site (DON 2019). In 2019, the USFWS estimated that no more than 12 black-naped terns (4 adults and 8 eggs or chicks) would be expected to be in the impact site during daylight hours (Appendix A of DON 2019). A maximum of 16 black-naped terns could be in the area when both adults are roosting at or near the nests (DON 2019). Several standard operating procedures and minimization measures would be implemented as part of the Proposed Action (see **Appendix C, Section C.3.2**) based on recommendations from the USFWS for past tests (DON 2019). Visual deterrents (e.g., scarecrows, Mylar flags, helium-filled balloons, or strobe lights) would be employed to deter birds from nesting and roosting in the impact zone and the area would be searched for nests, including eggs and chicks, prior to pre-flight activities and prior to test flights. If black-naped tern nests are found in the payload impact site, nests may be covered with an A-frame structure to protect eggs, chicks, and adults from debris and to serve as a warning to project personnel to avoid the nest area. With these mitigation measures in place, the impacts to black-naped terns and other birds from direct contact on Illeginni Islet would be minor to moderate.

As described above in the Elevated Sound Levels subsection, sea turtles are unlikely to haul out or nest on Illeginni Islet beaches. Because sea turtles are unlikely to occur in terrestrial habitats on Illeginni Islet and because protective mitigation measures would be in place, there would be no impact of direct contact on sea turtles on land or sea turtle nests.

A shoreline payload impact is not planned or expected and is considered unlikely. However, there is a chance that marine wildlife in nearshore reef habitats may be impacted by direct contact from natural debris ejected during crater formation. Several reef-associated fish species are known to occur in the nearshore waters of Illeginni Islet (see **Section 3.2.3.3**) and have the potential to be injured by ejecta entering reef habitats. These fish species occur on reefs throughout Kwajalein Atoll, and the number of fish species near Illeginni Islet is likely a small fraction of the populations of these fish in Kwajalein Atoll (DON 2019). Two UES consultation fish species have the potential to occur near Illeginni Islet and have the potential to be injured if exposed to direct contact from debris. While several factors make it unlikely that humphead wrasse would be contacted by ejecta (see DON 2019), analyses for past flight testing at Illeginni Islet have utilized worst-case scenario assumptions for direct contact based on the presence of up to 8 adult and 100 juvenile humphead wrasse in habitats offshore of the target site (NMFS 2021). Based on expected debris and ejecta quantity and distribution for a shoreline impact as well as the distribution of reef habitats offshore of the target site, the Navy estimates that up to 1 adult or 15 juvenile humphead wrasse might be injured or killed in the event of a shoreline payload impact. Bumphead parrotfish have been observed in reef surveys at other USAKA islets close to Illeginni Islet and it is possible that this species would occur in Illeginni reef habitats. Based on reported densities for this species throughout their range (densities in the Marshall Islands are estimated to be less than the range average of 0.7 individuals per 1,195 square yards), up to 1.2 bumphead parrotfish might be exposed to payload debris or ejecta in the event of either an ocean-side or lagoon-side shoreline payload impact. Even if the maximum of one test per year were assumed, CPS activities would not result in appreciable reduction of

these species (NMFS 2021) at Illeginni Islet or Kwajalein Atoll. Debris is expected to have negligible to minor effects on UES-listed fish in the Action Area.

Several coral and mollusk species occur in reefs adjacent to the payload impact zone at Illeginni Islet (see **Table 3.2.3-3**). Based on NMFS surveys of habitats with the potential to be subject to direct contact and shockwave effects (described in **Section 3.2.3.3**) and the estimated maximum area that may be affected by direct contact, the numbers of consultation coral colonies and individual mollusks that may be exposed were estimated (detailed in DON and USASMDC 2023) and are summarized in **Table D.2-2**. Based on the worst-case scenario of a shoreline payload impact, up to 1,521 UES-consultation coral colonies and 14 individual mollusks might be adversely affected by direct contact and shock waves for a single test. Not all corals exposed to debris or shock waves would be damaged but the most likely realized effects from contact would be cracks in the colony or broken branches or plates (U.S. Army 2021). Corals have the potential to regrow after damage, but damage and stress could still have a negative impact on growth rate, reproduction, or disease susceptibility (NMFS 2019). As detailed by NMFS (2019), since these corals are colonial organisms with hundreds to thousands of genetically identical interconnected polyps, affecting some polyps of a colony does not necessarily constitute harm to the individual (defined as a colony) as the colony can continue to exist even if the colony is damaged. Based on surveys of USAKA islets, harbors, and the mid-atoll corridor conducted between 2010 and 2016, the consultation coral and mollusk species with the potential to be affected as adults have all been observed at multiple Kwajalein Atoll islets (see **Table 3.2.3-3**). With the exception of *Acropora polystoma* (found at only 8% of sites) these consultation species appear to be common throughout Kwajalein Atoll. Density estimates are not available for non-consultation corals or mollusks; however, all of these species are present on islets throughout Kwajalein Atoll as well (see **Table 3.2.3-3**). The entire reef area with the potential for direct contact effects is small in comparison to the total comparable reef area surrounding and connected to Illeginni Islet and is considered extremely small compared to the comparable reef areas in the USAKA area and in Kwajalein Atoll (DON 2019). Direct contact would have negligible to moderate impacts on marine wildlife in nearshore waters at Illeginni Islet.

In summary, direct contact from the payload, debris, and ejecta would not change the relative population size or distribution of any terrestrial or marine species at Kwajalein Atoll. The impacts of direct contact on biological resources at Kwajalein Atoll would be negligible to moderate.

Table D.2-2. Estimated Maximum Number of UES Consultation Species Adversely Affected by Proposed CPS Activities

Common Name	Scientific Name	Estimated Maximum Number of Colonies or Individuals that May be Adversely Affected per Test (per year)
Corals		
	<i>Acropora microclados</i>	6
	<i>Acropora polystoma</i>	6
	<i>Cyphastrea agassizi</i>	4
	<i>Heliopora coerulea</i>	1,497
	<i>Pavona venosa</i>	4
	<i>Turbinaria reniformis</i>	4
Mollusks		
Giant clam	<i>Hippopus hippopus</i>	9
Top shell snail	<i>Rochia nilotica (Trochus niloticus)</i>	1
Giant clam	<i>Tridacna maxima</i>	2
Giant clam	<i>Tridacna squamosa</i>	2
Fishes		
Bumphead parrotfish	<i>Bolbometopon muricatum</i>	1
Humphead wrasse	<i>Cheilinus undulatus</i>	16

Source: DON and USASMDC 2023

Hazardous Materials

Biological resources in the ROI may be affected by exposure to hazardous materials entering terrestrial and marine habitats including:

- Exposure to materials of which the CPS payload is composed or are contained within the payload (see **Table 2.1.1-2**). Materials include heavy metals, plastics, batteries, and radio transmitters.
- Exposure to hazardous materials from operation of support vessels and equipment.

Mitigation measures and standard operating procedures would be employed to reduce potential impacts from hazardous materials as discussed in **Section 4.2.2.6** (Hazardous Materials and Waste Management) and summarized in **Appendix C, Section C.3.2**. All visible test debris, equipment, and project-associated waste would be cleaned-up and removed, as practicable. While every attempt would be made to clean up all visible metal and other fragments, it is possible and likely that some fragments would be too small to be recovered and a small amount of these heavy metals or other substances may remain in the terrestrial or marine environments at Illeginni Islet. Only trace amounts of hazardous materials are expected to remain in terrestrial areas. Operation of support equipment would not involve any intentional discharge of hazardous materials and spill prevention and response measures would be in place for operations.

Hazardous materials are not likely to adversely impact terrestrial or marine biological resources. Any hazardous material introduced into the land impact site is not expected to have a discernable or measurable impact on wildlife or vegetation because measures would be in place to clean up debris and contain any accidental spills or discharges from equipment. While some concern has been raised about the environmental effects due to the deposition and dissolution of tungsten from test activities at Illeginni Islet, no significant impacts are expected (see DON and USASMD 2023 for a detailed description and analysis of the potential consequences of tungsten). Impact of hazardous materials on terrestrial vegetation and wildlife would be minor to nonexistent. Because measures would be in place to prevent or clean up hazardous materials, no hazardous materials would be introduced into nearshore marine habitats at Illeginni Islet. In deep offshore waters, hazardous materials would be quickly diluted by ocean waters and debris fragments are expected to sink to the ocean bottom. Marine vertebrates, including special-status species, are unlikely to encounter chemicals at harmful concentrations. Because there would only be up to eight flight tests, introduction of hazardous chemicals into the water is not expected to alter water quality in a way that would cause secondary harm to marine biological resources. Overall, there would be negligible impact to biological resources at Kwajalein Atoll from hazardous materials.

Human Activity and Equipment Operation

The Proposed Action would involve human activity and equipment operation on Illeginni Islet and other Kwajalein Atoll locations for up to 8 weeks for each flight test including:

- Aircraft and vessels would be used to transport equipment and personnel and to deploy and retrieve self-stationing sensor rafts. There would be several pre-test and post-test vessel round-trips to and from Illeginni Islet.
- Operation of self-stationing rafts in ocean and lagoon waters for sensor coverage. Self-stationing sensor rafts may include hydrophones and would be placed in waters at least 10 ft deep to avoid contact with coral colonies.
- Personnel on Illeginni Islet to place test support equipment and for clean-up operations.
- Heavy equipment and truck operation to transport equipment, excavate the crater, screen debris, and backfill the crater with substrate ejected from the crater.

Wildlife in and near the payload impact zone have the potential to be impacted by human disturbance and equipment operation. A number of mitigation measures would be in place for operations at USAKA to reduce potential impacts to biological resources (**Appendix C, Section C.3.2**). At Illeginni Islet, equipment would be used either within the land impact site or on designated access points at Illeginni Islet. Pre- and post-test activities would be conducted during daylight hours, as practicable and within mission requirements.

Deep Offshore Waters. Pre-test preparation and post-test cleanup and recovery operations would result in increased vessel traffic to and from the offshore impact site. Vessel traffic would likely include several vessel round-trips to and from the offshore impact site. Marine wildlife in the offshore payload impact site are not expected to be impacted by human activity and vessel

operations (DON 2019). Only a small number of vessel trips would be required in this area to position the self-stationing sensor rafts, and to clean up floating debris post-test. While cetaceans and sea turtles must surface to breathe and are known to bask at the ocean surface, these are highly mobile animals capable of avoiding vessels, and measures will be in place during vessel operation to detect and avoid marine wildlife. Given the low densities of rare or special status marine wildlife in the ROI, the chances of an animal being impacted by human disturbance or being struck by a vessel are considered to be very low. Impacts to marine wildlife from human disturbance or vessel operation would be negligible to minor.

Illeginni Islet. Birds in and near the payload impact site on Illeginni Islet may be disturbed by human activity and equipment operation. However, mitigation measures would be in place to reduce the potential for impacts to nesting birds. Some birds may leave the area during the period of human activity and equipment operation, but no physical injury or nest abandonment is expected. Hauled-out or nesting sea turtles are unlikely to occur on Illeginni Islet and no proposed activities would occur in beach habitats. The impacts of human activity and equipment operation on terrestrial wildlife would be negligible to minor.

Planned human activity and equipment operation in marine areas would only involve vessel movement to and from Illeginni Islet and use of sensor rafts. No anchoring would occur in nearshore habitats and all equipment and personnel arriving via vessel would load and offload at Illeginni Harbor. No debris recovery or other cleanup activities are expected to be required in shallow nearshore waters. In the event that debris entered the nearshore marine environment, several measures would be in place to protect reef habitats and UES-consultation species. During planned test activities, nearshore reef-associated species including corals and mollusks would not be impacted by human activity and equipment operation.

Consequences for Special Status Wildlife

UES Coordination and Consultation Species. The Navy has evaluated the potential effects of the Proposed Action on UES listed species and coordination habitats. The Navy has concluded that proposed activities at USAKA may affect coordination species and habitats but that those activities would not have significant effects on those resources. The Navy completed a review of potential effects of the Proposed Action on coordination resources (pursuant to Section 3-4.6.3[a] of the UES) in this section and submitted the Draft EA/OEA to the UES Appropriate Agencies as a preliminary review in compliance with Section 3-4.6.3(b) of the UES (USASMDC 2024).

The Navy has also concluded that the Proposed Action may affect but is not likely to adversely affect UES consultation cetaceans, sea turtles, and most fish, but that the Action may affect and is likely to adversely affect several UES consultation corals, mollusks, and humphead wrasse. The Navy has prepared a Biological Assessment (DON and USASMDC 2023) to support consultation with NMFS and USFWS as required under Section 3-4.5.3 of the UES (USASMDC 2024) and initiated consultation on December 8, 2023. The USFWS issued a letter of concurrence with the Navy conclusion that sea turtles were not likely to be adversely affected by the Proposed Action (**Appendix E, Section E.2.4**). NMFS issued a biological opinion

concluding that proposed activities were either not likely to adversely affect or were not likely to jeopardize the continued existence of UES consultation species (NMFS 2024b). Because a biological opinion was rendered by NMFS, the Navy and USASMDC prepared a Notice of Proposed Activity to meet requirements of the UES and plan to prepare a Document of Environmental Protection as required under UES Section 2-18.3.

Consequences for Environmentally Sensitive Habitats

UES Coordination Habitats. The Navy has evaluated the potential effects of the Proposed Action on UES listed species and coordination habitats. The Navy has concluded that proposed activities at USAKA may affect coordination habitats at Illeginni Islet including bird nesting habitat and nearshore marine habitats but that those activities would not have significant effects on those habitats. While temporary disturbance of some habitats may occur, DoD testing has been occurring on Illeginni Islet for decades and CPS testing would not alter tempo of that testing or the baseline condition of coordination habitats in the ROI. The Navy completed a review of potential effects of the Proposed Action on coordination resources (pursuant to Section 3-4.6.3[a] of the UES) in this section and submitted the Draft EA/OEA to the UES Appropriate Agencies as a preliminary review in compliance with Section 3-4.6.3(b) of the UES (USASMDC 2024).



E

Agency
Correspondence



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Appendix E. Agency Correspondence

Appendix E contains correspondence sent between USASMDC, the Navy, and United States Government and RMI agencies with respect to participation in development of the EA/OEA, ESA compliance, and UES compliance.

E.1. Agency Participation in EA/OEA Development Correspondence

E.1.1 Coordinating Draft Request for Participation Letter



REPLY TO
ATTENTION OF

DEPARTMENT OF THE ARMY
U.S. ARMY SPACE AND MISSILE DEFENSE COMMAND
POST OFFICE BOX 1500
HUNTSVILLE, ALABAMA 35807-3801

Environmental Division

December 22, 2023

Re: Navy Conventional Prompt Strike Weapon System Flight Tests Environmental
Assessment/Overseas Environmental Assessment Participation and Review Request

Dear Agency Representative,

The United States Army Space and Missile Defense Command (USASMDC) is assisting the Department of the Navy Strategic Systems Programs, the Action Proponent, in environmental compliance for the proposed Navy Conventional Prompt Strike (CPS) Weapon System Flight Tests program. The Department of the Navy, with the assistance of USASMDC, has prepared a Coordinating Draft Environmental Assessment (EA) / Overseas Environmental Assessment (OEA) to evaluate the potential environmental impacts of the Proposed Action to meet requirements of the U.S. National Environmental Policy Act (NEPA). As an agency with potential regulatory oversight of, interest in, or expertise related to this project, USASMDC and the Navy invite you to participate in the NEPA process by providing comments on the enclosed Coordinating Draft EA/OEA.

As described in the enclosed Coordinating Draft EA/OEA, the Proposed Action consists of conducting Navy CPS weapon system (missile) flight tests in both Atlantic and Pacific Ocean regions. Testing would involve up to eight flight test launches per year from various sea-based launch locations conducted over a 10-year period. All flight tests would be at-sea missile tests launched from existing naval vessels operating in Pacific and Atlantic broad ocean areas. After launch, flight test activities would include vehicle flight over the Pacific and/or Atlantic Oceans and would involve splashdown of spent boosters and fairings in Pacific and Atlantic broad ocean areas. Navy CPS flight test payloads would impact at target sites in the broad ocean area and at U.S. Army test sites at Kwajalein Atoll within the Republic of the Marshall Islands.

Your organization is among several regulatory and resource management agencies invited to participate in this coordinating draft review. If you have comments or recommendations based on your review of the EA/OEA, we request you submit written comments to Mr. David Fuller at david.g.fuller6.civ@army.mil by January 25, 2024, using the provided blank comment form. After the coordination period concludes, the Navy and USASMDC will prepare a Draft EA/OEA with consideration of provided comments and recommendations. We will then publish the Draft EA/OEA and a Draft Finding of No Significant Impact (if appropriate) for public review and comment.

If you have questions regarding this request or the proposed project, please contact Mr. David Fuller in my office, USASMDC Environmental Division, at (256) 955-5585, or david.g.fuller6.civ@army.mil.

Sincerely,

HASLEY.DAVID
.C.1230984308

Digitally signed by
HASLEY.DAVID.C.1230984308
Date: 2023.12.20 11:16:04 -06'00'

Weldon H. Hill, Jr.
Deputy Chief of Staff, Engineer
U.S. Army Space and Missile Defense Command

Enclosures (2):

- (1) Navy CPS Weapon System Flight Tests Coordinating Draft Environmental Assessment/Overseas Environmental Assessment
- (2) Blank Comment Form

E.1.2 Notice of Availability of the Draft EA/OEA Letter



REPLY TO
ATTENTION OF

DEPARTMENT OF THE ARMY
U.S. ARMY SPACE AND MISSILE DEFENSE COMMAND
POST OFFICE BOX 1500
HUNTSVILLE, ALABAMA 35807-3801

Environmental Division

May 30, 2024

Subject: Notice of Availability of the Navy Conventional Prompt Strike Weapon System Flight Tests Draft Environmental Assessment / Overseas Environmental Assessment

Dear Interested Party,

The United States Army Space and Missile Defense Command (USASMD) is assisting the Department of the Navy Strategic Systems Programs, the Action Proponent, in environmental compliance for the proposed Navy Conventional Prompt Strike (CPS) Weapon System Flight Tests program. The Department of the Navy, with the support of USASMD, has prepared a Draft Environmental Assessment (EA) / Overseas Environmental Assessment (OEA) to evaluate the potential environmental impacts of the Proposed Action to meet requirements of the U.S. National Environmental Policy Act (NEPA). USASMD and the Navy announce the availability of the Draft EA/OEA and Draft Finding of No Significant Impact (FONSI) / Finding of No Significant Harm (FONSH) and welcome your review and substantive comments on the Draft EA/OEA.

As described in the Draft EA/OEA, the Proposed Action consists of conducting Navy CPS weapon system (missile) flight tests in both Atlantic and Pacific Ocean regions. Testing would involve up to eight flight test launches per year from various sea-based launch locations conducted over a 10-year period. All flight tests would be at-sea missile tests launched from existing naval vessels operating in Pacific and Atlantic broad ocean areas. After launch, flight test activities would include vehicle flight over the Pacific and/or Atlantic Oceans and would involve splashdown of spent boosters and fairings in Pacific and Atlantic broad ocean areas. Navy CPS flight test payloads would impact at target sites in the broad ocean area and at U.S. Army test sites at Kwajalein Atoll within the Republic of the Marshall Islands.

The Draft EA/OEA evaluates the potential impacts to the human and natural environment from implementing the proposed CPS weapon system flight tests program. The No Action Alternative is also evaluated as a requirement of NEPA to serve as a baseline from which to analyze the effects of not implementing the test program. Supported by the information and environmental analysis presented in this document, the Navy will decide whether to conduct up to eight CPS flight tests annually over a 10-year period or to select the No Action Alternative. The Draft EA/OEA evaluates several environmental/resource categories within the affected environment that potentially could be impacted to provide Navy decision makers with sufficient information to plan and make informed decisions on the proposed CPS flight tests program. The Navy has determined that the activities associated with the Proposed Action would not result in significant impacts to the human and natural environment and has also drafted a FONSI/FONSH.

To review the Draft EA/OEA and Draft FONSI/FONSH and for additional information pertaining to the proposed Navy CPS Weapon System Flight Tests, please visit the Current Projects page of the Navy's NEPA Projects website at <https://www.nepa.navy.mil/CPSSea-Based>. The Draft EA/OEA is also available at the following public libraries:

Anchorage Public Library

3600 Denali Street
Anchorage, AK 99503

Cape Canaveral Public Library

201 Polk Avenue
Cape Canaveral, FL 32920

City of San Diego Central Library

330 Park Boulevard
San Diego, CA 92101

Grace Sherwood Library

Kwajalein Island
Republic of the Marshall Islands

Hawai'i State Library

478 South King Street
Honolulu, HI 96813

Jacksonville Public Library

303 North Laura Street
Jacksonville, FL 32202

Kitsap Regional Library

700 Northeast Lincoln Road
Poulsbo, WA 98370

Oxnard Downtown Main Library

251 South A Street
Oxnard, CA 93030

Roi-Namur Library

Roi Namur
Republic of the Marshall Islands

Slover Memorial Main Library

235 East Plume Street
Norfolk, VA 23510

Seattle Public Library

1000 Fourth Avenue
Seattle, WA 98104

The 30-day public comment period will begin June 3, 2024 and end July 3, 2024. Comments may be submitted either online on the project website at

<https://www.nepa.navy.mil/CPSSea-Based> or by mail to:

Environmental Program Manager/SP2521
Strategic Systems Programs
1250 10th Street SE, Bldg. 200, Suite 3600
Washington Navy Yard, DC 20374-5127

Comments must be submitted or postmarked by July 3, 2024. All comments submitted during the 30-day public comment period will be part of the public record and substantive comments will be addressed in the Final EA/OEA.

If you have questions regarding the public comment period for the Draft EA/OEA or the proposed project, please contact Mr. David Fuller in my office, USASMDC Environmental Division, at (256) 955-5585, or david.g.fuller6.civ@army.mil.

Sincerely,

HILL.WELDON.H.JR.1216862682

Digitally signed by HILL.WELDON.H.JR.1216862682
Date: 2024.05.22 11:49:01 -05'00'

Weldon H. Hill, Jr.
Deputy Chief of Staff, Engineer
U.S. Army Space and Missile Defense Command

E.2. Biological Resources Coordination and Consultation Correspondence

E.2.1 Request for UES Section 3-4.5 Consultation with USFWS



REPLY TO
ATTENTION OF

DEPARTMENT OF THE ARMY
U.S. ARMY SPACE AND MISSILE DEFENSE COMMAND
POST OFFICE BOX 1500
HUNTSVILLE, ALABAMA 35807-3801

December 8, 2023

Dan A. Polhemus, PhD
U.S. Fish and Wildlife Service
Pacific Islands Fish and Wildlife Office
300 Ala Moana Boulevard
Honolulu, HI 96850

Re: Request for Initiation of Informal Consultation under Section 3-4.5 of the UES for Navy Conventional Prompt Strike Weapon System Flight Tests Activities at Kwajalein Atoll

Dear Dr. Polhemus,

The United States Army Space and Missile Defense Command (USASMDC) is assisting the Department of the Navy Strategic Systems Programs, the Action Proponent, in evaluating the effects of proposed Navy Conventional Prompt Strike (CPS) Weapon System Flight Tests activities. The Action Proponent has determined that proposed activities at Kwajalein Atoll may affect but are not likely to adversely affect species listed as consultation species under the *Environmental Standards and Procedures for United States Army Kwajalein Atoll (USAKA) Activities in the Republic of the Marshall Islands (UES)* and request informal consultation with your office under Section 3-4.5 of the UES.

The Proposed Action consists of conducting Navy CPS weapon system (missile) flight tests in both Atlantic and Pacific Ocean regions. Testing would involve up to eight flight test launches per year from various sea-based launch locations conducted over a 10-year period. All flight tests would be at-sea missile tests launched from existing naval vessels operating in Pacific and Atlantic broad ocean areas (BOAs). After launch, flight test activities would include vehicle flight over the Pacific and/or Atlantic Oceans and would involve splashdown of spent boosters and fairings in Pacific and Atlantic BOAs. Navy CPS flight test payloads would impact at target sites in the BOA and in the Republic of the Marshall Islands (RMI). Within the RMI, payload target sites include the deep-water Kwajalein Missile Impact Scoring System test range and a land site on Illeginni Islet at the Ronald Reagan Ballistic Missile Defense Test Site.

USASMDC and the Navy have prepared a Biological Assessment to evaluate the effects of the Proposed Action on species listed as consultation species under Section 3-4 of the UES. As described in the enclosed Navy CPS Weapon System Flight Tests Biological Assessment for Activities at Kwajalein Atoll, a number of UES protected species occur or have the potential to occur in the Action Area and we have evaluated the effects of the Proposed Action on these species and their habitats.

Based on analyses of all of the potential stressors resulting from the Proposed Action, the Action Proponent has determined that the Proposed Action "may affect but is not likely to adversely

affect” nesting or hauled-out sea turtles protected under Section 3-4 of the UES, specifically green turtles (*Chelonia mydas*) and hawksbill turtles (*Eretmochelys imbricata*). Based on the analysis in the enclosed Biological Assessment, the effects of the Proposed Action on these species would be insignificant or discountable as no sea turtle nests or nesting activity has been observed on Illeginni Islet in over 25 years. Our supporting analysis is provided in the enclosed Biological Assessment.

On behalf of the Navy, USASMDC requests initiation of informal consultation with the U.S. Fish and Wildlife Service under Section 3-4.5 of the UES and requests your written concurrence if you agree with our determinations. We would greatly appreciate acknowledgement in writing (electronic mail will be sufficient) that all necessary information has been received and that the consultation has been initiated.

I am also providing copies of this letter and the Biological Assessment to Ms. Moriana Phillip, Republic of the Marshall Islands Environmental Protection Authority – Majuro; Mr. Michael Desilets, U.S. Army Corps of Engineers – Honolulu; Ms. Angela Sandoval, U.S. Environmental Protection Agency – Region 9; and Dr. Steve Kolinski, National Marine Fisheries Service, Pacific Islands Regional Office.

Please contact David Fuller in my office, USASMDC Environmental Division, regarding this consultation request at 256-955-5585 or david.g.fuller6.civ@army.mil.

Sincerely,

HILL.WELDON.H.JR.1216862682  Digitally signed by HILL.WELDON.H.JR.1216862682
Date: 2023.12.06 10:49:12 -06'00'
Weldon H. Hill, Jr.
Deputy Chief of Staff, Engineer
U.S. Army Space and Missile Defense Command

Enclosure: Navy CPS Weapon System Flight Tests Biological Assessment for Activities at Kwajalein Atoll

E.2.2 USFWS UES Section 3-4.6 Coordination Response



United States Department of the Interior

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



February 20, 2024

David C. Hasley
Chief, Environmental Division
Deputy Chief of Staff, Dngineer/DSCENG
U.S. Army Space and Missile Defense Command

Subject: Re: UES Section 3-4.5 consultation request for the Navy's Conventional Prompt Strike Flight Tests Program - 2023-12-08T20:00:20.803Z

Dear Mr. Hasley:

The U.S. Fish and Wildlife Service (Service) received your request for Consultation on the proposed Navy Conventional Prompt Strike (CPS) Weapon System Flight Tests program Biological Assessment for Activities at Kwajalein Atoll, Deceonmber 8, 2023. Please find our enclosed comments in accordance with the U.S. National Environmental Policy Act (NEPA) and the Environmental Standards and Procedures for U.S. Army Kwajalein Atoll (USAKA) Activities in the Republic of the Marshall Islands (UES section 3-4.6.3).

Summary

The proposed action includes a series of up to 80 missile test flights over a period of 10 years beginning in fiscal year 2025. Testing aims to verify CPS at-sea capabilities to enhance U.S. response to time-sensitive threats. Test flights would originate from Navy vessels operating in the Pacific and Atlantic Oceans. Payloads would terminate at open ocean floating raft targets and at Illeginni Islet, Kwajalein Atoll, Republic of the Marshall Islands. Each test would also include splashdown of spent boosters and fairings across broad ocean areas. Approximately one test per year is expected to terminate on land at Illeginni Islet.

Reentry vehicles (RVs) that impact Illeginni are expected to be primarily composed of aluminum, steel, titanium, magnesium and other alloys, copper, fiberglass, chromate coated hardware, tungsten (up to 1000 lbs. per test), plastic, Teflon, quartz, silicone, and batteries. Payloads have potential to include explosives and RV components are likely to be distributed in the area of and surrounding the 7.6 acre target ate the west end of Illeginni. Soil containing residual concentrations of beryllium, depleted uranium, and tungsten originating from prior

INTERIOR REGION 9
COLUMBIA-PACIFIC NORTHWEST
IDAHO, MONTANA*, OREGON*, WASHINGTON
*PARTIAL

INTERIOR REGION 12
PACIFIC ISLANDS
AMERICAN SAMOA, GUAM, HAWAII, NORTHERN
MARIANA ISLANDS

weapons testing in the area may also be redistributed throughout the area, most extensively westward or downwind. This area likely includes protected species and environmentally sensitive habitats.

Comments

Marine turtles are the primary USFWS UES Consultation species that are most likely to be impacted by this project. The Service will provide comments specifically related to marine turtle and turtle habitat separately. Comments herein are provided for additional consideration.

This assessment describes approximately 80 missile test flights. Each test will drop waste in open ocean environments in the Pacific and/or Atlantic and terminate at Illeginni Islet. Direct environmental impacts of the described flight tests alone are expected to be minor, however, minor additive impacts by many cumulative actions over multiple decades can result in significant environmental degradation. These tests will potentially increase cumulative environmental impacts caused by decades of past and ongoing weapons testing at Illeginni.

The Service remains concerned about cumulative impacts of weapons testing at Illeginni. Our recent environmental reviews of similar weapons testing activities have expressed this concern. EPA has repeatedly recommended a programmatic approach for weapons testing across DoD, along with enhanced sampling and testing of soils and groundwaters for contaminants. While soil and water tests have indicated low concentrations of contaminants on Illeginni, a discrepancy has been noted in test results (EA/OEA Section 3.2.4.3). More affective sampling should be considered.

EPA provided expert advice on data collection and analysis including composite samples taken after all DoD flight tests (see EPA comments on the Navy Conventional Prompt Strike Weapon System Flight Tests Coordinating Draft Environmental Assessment (CDEA) January 25, 2024) and requested more detailed and transparent sharing of sampling methods, locations, and times relative to flight tests. The Service agrees with the EPA's position on the need for robust monitoring and reporting on contaminant cumulation considering all DoD weapons testing at Illeginni. The service further recommends enhanced environmental monitoring of lagoon and seaward coral reefs and other habitats, including long term site-specific data collection to monitor potential impacts of seepage or dust distribution of contaminants to coastal benthic habitats around Illeginni.

Global loss of coral reef ecosystems, including the multitude of protected species that make them up, is a result of cumulative impacts of a variety of direct and indirect human influences. Introducing physical and chemical disturbance through weapons testing at any scale includes direct and indirect impacts that can be mitigated and avoided.

Terminal payload impacts at Illeginni will disperse debris, dust, and volatilized contaminants. Debris and ejecta could directly impact biological resources in an area up to a 300 ft radius from the point of impact (EA/OEA Section 4.2.2.3). Fugitive dust caused by impact would be redistributed to waters adjacent to (most likely westward/downwind of) the site (EA/OEA Section 4.2.2.1). Contaminants could settle in nearshore ecosystems. Any soil and water contamination on Illeginni could be deposited in the nearshore environment via groundwater

seeps, saltwater/groundwater mixing, and erosion, and increasingly so with rising sea levels and climate change.

Terminal payload impact has the potential to affect species and habitats protected under the UES.

Cumulation of minor additive environmental impacts can amplify significance/harm of each minor impact over time. It is important to avoid legal and harmful thresholds and ensure that sufficient monitoring is carried out to accurately track those impacts collectively.

Recommendations

1. The Service recommends attention to marine turtle and turtle habitat comments and recommendations that will be provided separately.
2. The Service recommends that procedures for sampling, testing, and tracking of soil and water contaminants at Illeginni continue to be reviewed and developed to enhance understanding of potential cumulative impacts across projects in addition to project by project assessments.
3. The Service recommends plans to continue developing ecological monitoring of reef habitats adjacent to Illeginni, along with reference sites at Kwajalein Atoll, to better track conditions of coastal benthic habitats over time. This may help to support indications that impacts of weapons testing projects at Illeginni may be minor.
4. The Service recommends Navy provide an incident response plan in the case one or more RVs miss the intended target and directly impact coastal habitats and species.

Conclusion

The Service recommends continuing this project according to schedule with consideration of the above recommendations.

We appreciate the opportunity to provide input on this correspondence. If you have questions regarding our comments, please contact Aquatic Ecosystem Conservation Program Biologist Jeremy Raynal (jeremy_raynal@fws.gov), or Program Manager Dan Polhemus (dan_polhemus@fws.gov).

Sincerely,
ANTHONY
MONTGOMERY

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MONTGOMERY
Date: 2024.02.20 11:30:27 -10'00'

Anthony Montgomery
Acting Aquatic Ecosystem Conservation Team Manager

E.2.3 Response to USFWS Recommendations



REPLY TO
ATTENTION OF

DEPARTMENT OF THE ARMY
U.S. ARMY SPACE AND MISSILE DEFENSE COMMAND
POST OFFICE BOX 1500
HUNTSVILLE, ALABAMA 35807-3801

March 7, 2023

Dan Polhemus, PhD
U.S. Fish and Wildlife Service
Pacific Islands Fish and Wildlife Office
300 Ala Moana Boulevard
Honolulu, HI 96850

Re: UES Section 3-4.5 consultation for Navy Conventional Prompt Strike Weapon System Flight Tests Activities at Kwajalein Atoll USFWS Reference Number 2023-12-08T20:00:20.803Z.

Dear Dr. Polhemus,

The United States Army Space and Missile Defense Command (USASMDC) received the United States Fish and Wildlife Service's (USFWS or Service) comments related to the Department of the Navy (Navy) Conventional Prompt Strike (CPS) Weapon System Flight Tests activities in accordance with the U.S. National Environmental Policy Act (NEPA) and the Environmental Standards and Procedures for United States Army Kwajalein Atoll (USAKA) Activities in the Republic of the Marshall Islands (UES) Section 3-4.6.3. We appreciate your comments and recommendations. Please find enclosed our response to the recommendations the Service provided in the letter dated 20 February 2024.

Regarding recommendation number 1: "The Service recommends attention to marine turtle and turtle habitat comments and recommendations that will be provided separately."

Response: USASMDC and the Navy will consider any comments and recommendations which are provided by the Service.

Regarding recommendation number 2: "The Service recommends that procedures for sampling, testing, and tracking of soil and water contaminants at Illeginni continue to be reviewed and developed to enhance understanding of potential cumulative impacts across projects in addition to project by project assessments."

Response: USASMDC is currently drafting standardized soil and water sampling, testing, and reporting procedures for flight test activities at Illeginni Islet to support our planned programmatic evaluation and Document of Environmental Protection for USASMDC mission flight test activities. Once drafted in coordination with the United States Army Garrison – Kwajalein Atoll (USAG-KA), USASMDC plans to coordinate these procedures with the Service and other UES Appropriate Agencies. Once finalized, these sampling and testing procedures will be implemented for all flight test programs terminating at Illeginni Islet, including the Navy CPS Weapons System Flight Tests program.

Regarding recommendation number 3: “The Service recommends plans to continue developing ecological monitoring of reef habitats adjacent to Illeginni, along with reference sites at Kwajalein Atoll, to better track conditions of coastal benthic habitats over time. This may help to support indications that impacts of weapons testing projects at Illeginni may be minor.”

Response: USASMDC fully supports the Service’s efforts, in conjunction with the National Marine Fisheries Service (NMFS) and USAG-KA, to conduct biannual inventories of reef habitats at Illeginni and throughout USAKA as required under UES Section 3-4.9.2. USASMDC would be happy to discuss survey priorities with the Service and NMFS as well as ways we can support those survey efforts.

Regarding recommendation number 4: “The Service recommends Navy provide an incident response plan in the case one or more RVs miss the intended target and directly impact coastal habitats and species.”

Response: Navy CPS Weapons System Flight Test activities would follow the standard management practices and mitigation measures for flight test activities terminating at Illeginni Islet. These measures include the requirement that:


“When feasible, within 1 day after the land impact test at Illeginni Islet, USAKA RTS environmental staff would survey the islet and the near-shore waters for any injured wildlife or damage to sensitive habitats (i.e., sea turtle nesting habitat). Any impacts to special-status biological resources would be reported to the UES Appropriate Agencies via USASMDC, with USFWS, RMI Environmental Protection Authority, and NMFS offered the opportunity to inspect the impact area to provide guidance on mitigations.”

USASMDC does not plan to prepare a response plan for Navy CPS or other flight test activities terminating at Illeginni Islet because measures are in place to coordinate an appropriate response with the subject matter experts at the Service and NMFS should a payload directly impact coastal habitats and species.

We acknowledge that the Service recommends continuing Navy CPS Weapons System Flight Tests activities with consideration of the Service provided recommendations. USASMDC has considered the Service’s recommendations as described above and plans to proceed with assisting the Navy with environmental compliance requirements for this proposed project under NEPA and the UES.

Please contact David Fuller in my office, USASMDC Environmental Division, regarding this letter or the proposed Navy CPS Weapons System Flight Tests at 256-955-5585 or david.g.fuller6.civ@army.mil.

Sincerely,

HILL.WELDON.H.JR.1216862682  Digitally signed by HILL.WELDON.H.JR.1216862682
Date: 2024.03.11 11:25:43 -05'00'

Weldon H. Hill, Jr.
Deputy Chief of Staff, Engineer
U.S. Army Space and Missile Defense Command

E.2.4 USFWS Section 3-4.5 Consultation Response – Letter of Concurrence



United States Department of the Interior

FISH AND WILDLIFE SERVICE
Pacific Islets Fish and Wildlife Office
300 Ala Moana Boulevard, Room 3-122
Honolulu, Hawai'i 96850



In Reply Refer To:
2024-0050167-S7-001

March 5, 2024

Mr. Weldon H. Hill Jr.
c/o Mr. David Fuller
U.S. Army Space and Missile Defense Command
P.O. Box 11500
Huntsville, Alabama 35807-3801

Subject: Informal Consultation for the Proposed Navy Conventional Prompt Strike
Weapon System Flight Tests, Kwajalein Atoll

Dear Mr. Hill:

The U.S. Fish and Wildlife Service (Service) received your email on December 8, 2023. We understand that you, the U.S. Army Space and Missile Defence Command (USASMD), are assisting the Navy Strategic Systems Programs, the action proponent, in evaluating the effects of the proposed Navy Conventional Prompt Strike (CPS) Weapon System Flight Tests activities. You have requested our concurrence with your determination that the proposed activities at the U.S. Army Garrison Kwajalein Atoll (USAG-KA), Republic of Marshall Islets (RMI), may affect, but is not likely to adversely affect the federally endangered Central West Pacific Distinct Population Segment (DPS) of the green sea turtle (*Chelonia mydas*) and endangered hawksbill sea turtle (*Eretmochelys imbricata*) (hereafter referred to as sea turtles).

The findings and recommendations in this consultation are based on the following: 1) your informal consultation request dated December 8, 2023; 2) December 2023 Biological Assessment; 3) email correspondence provided on February 29, 2024; and 4) other information available to us. The Service consults on sea turtles and their use of terrestrial habitats (beaches where nesting and/or basking is known to occur), whereas the National Oceanic and Atmospheric Administration Fisheries (NMFS) consults on sea turtles in aquatic habitats. Therefore, this consultation only addresses the effects to sea turtles in their terrestrial habitats. Our response is in accordance with Section 7 of the Endangered Species Act of 1973 as amended (16 U.S.C. 1531 *et seq.*).

PACIFIC REGION 1

IDAHO, OREGON*, WASHINGTON,
AMERICAN SĀMOA, GUAM, HAWAII, NORTHERN MARIANA ISLETS

*PARTIAL

Mr. Weldon H. Hill Jr.

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Project Description

The Navy CPS weapon system (missile) flight tests are proposed to be conducted in the Pacific Ocean region with deepwater and terrestrial impact sites. Testing would involve up to eight flight test launches per year from various sea-based launch locations conducted over a 10-year period. All flight tests would be at-sea missile tests launched from existing naval vessels operating in the Pacific broad ocean areas (BOA). After launch, flight test activities would include vehicle flight over the Pacific Ocean and would involve splashdown of spent boosters and fairings in the Pacific BOA. Navy CPS flight test payloads would impact at target sites in the BOA and in USAG-KA. Within USAG-KA, payload target sites include deep-water Kwajalein Missile Impact Scoring Systems test range just east of Gagan Islet and Ronald Regan Ballistic Missile Defense Test Site (RTS) on Illeginni Islet. Impact on Illeginni Islet would occur once a year over the 10-year period. No activities are proposed to occur on Gagan Islet or its shorelines.

Activities occurring on Illeginni Islet include pre-flight preparations, flight test impact, and post-test operations. These activities may occur at anytime during the year. Pre-flight activities include transporting personnel and equipment to Illeginni Islet using helicopters or surface vessel and will likely result in increased human activity prior to flight test. It is anticipated that all pre-flight activities would occur during daylight hours. Heavy equipment may be used to prepare target area and other monitoring equipment around the target site.

Re-entry vehicles (RVs) will target a location on Illeginni Islet in a 7.6 acre area on the non-forested western end of the Islet that includes the helipad (Figure 1). RVs that impact Illeginni Islet are expected to be primarily composed of aluminum, steel, titanium, magnesium and other alloys, copper, fiberglass, chromate coated hardware, tungsten (up to 1000 lbs. per test), plastic, Teflon, quartz, silicone, and batteries. Payloads have the potential to include explosives. Impacts may occur at anytime during a 24-hour period.

When test-missile payloads impact the land, soil, rubble, and test-missile payload fragments are ejected outward from the impact site over a wide area. The following assumptions on cratering are based on recent hypersonic flight tests. Craters created by the impact may be 6 to 9 meters (m) (20 to 30 feet (ft)) in diameter and 2 to 3 m (7 to 10 ft) deep. Most of the test missile debris and displaced earth would remain close to the edge of the crater and the density of the ejecta would decrease with distance away from the crater; however, crater formation may eject materials 60 to 91 m (200 to 300 ft) from the crater.

Test-missile impact on the shoreline or in nearshore waters is not expected. However, the exact impact location and distribution of ejecta is unknown. Utilizing data from previous hypersonic flight tests, most of the ejecta would fall on land. In a worst-case scenario, impact near the shoreline could result in ejecta dispersing onto the shoreline and into nearshore waters occurring in a 13,008 m² (15,557 yard²) area (Figure 1). Test-missile impact in shallow water (depths 3 meters or less) of the reef could create a crater 3 to 4.6 m wide and 0.6 to 1.2 m deep. Prior testing shows that craters are not formed in water deeper than 3 m.

Post-test activities will increase human activity on Illeginni Islet for the duration of clean-up and completion of repairs. It is anticipated that all post-test activities would occur during daylight

Mr. Weldon H. Hill Jr.

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hours. Assessment of target site on Illeginni Islet will be conducted prior to initiating equipment recovery and cleanup on land, in shallow and reef flats. Personnel will be transported to Illeginni by surface vessel. Activities associated with clean-up will include wetting down the area to stabilize disturbed soil, recover payload debris as much as possible, backfill impact crater and repair Islet structures as appropriate. Heavy equipment maybe used to assist with cleanup and repair. Backhoes and graders excavate material from craters, where the excavated materials are screened for debris and then the crater is backfilled with the surrounding ejected material. On land, visible debris are collected by hand, including hazardous materials. All recovered debris are backed and shipped back to Kwajalein Islet.

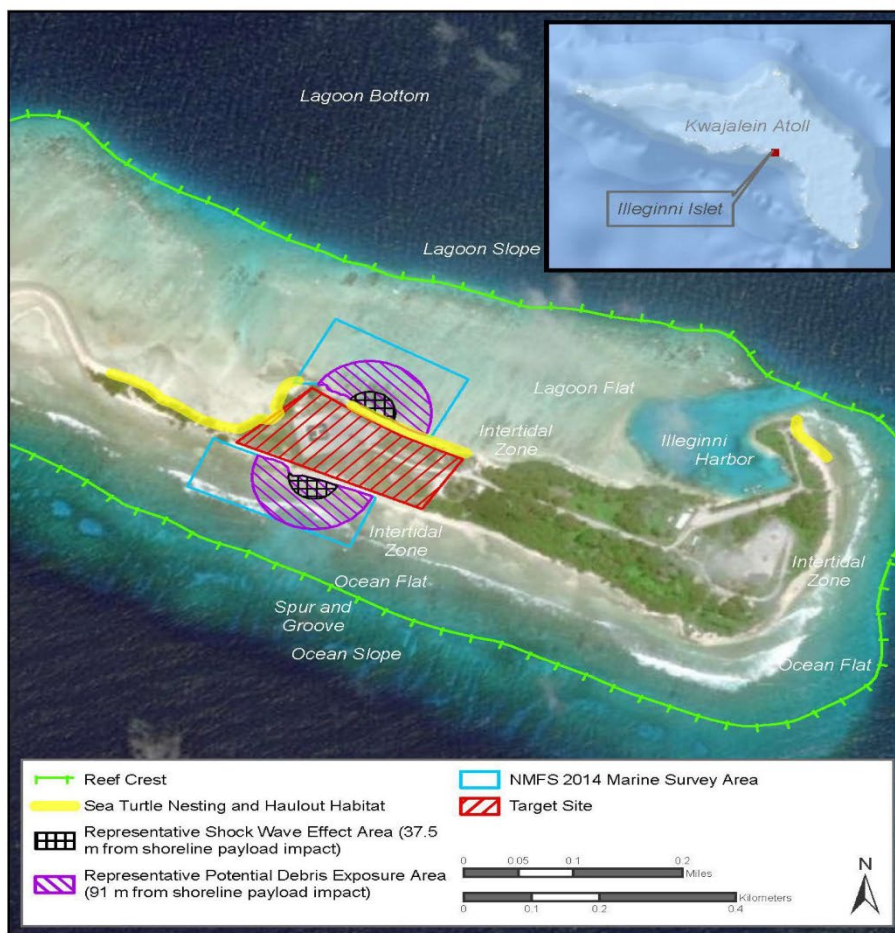


Figure 1. Estimated Maximum Direct Contact and Shockwave Areas at Illeginni Islet

Mr. Weldon H. Hill Jr.

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Conservation Measures

To avoid and minimize potential project impacts on sea turtles, the following measures identified in your Biological Assessment will be implemented:

Sea Turtles

- For at least eight weeks preceding launch, pre-flight test monitoring by personnel familiar with sea turtles basking and nesting behavior will survey weekly for sea turtles, sea turtle nesting activity, and sea turtle nests on Illeginni Islet. If possible, personnel will inspect the area within days of the launch.
- Sea turtle opportunistic sightings will be collected, recorded, and reported during ship travel, overflights, and deployment of sensor rafts in the vicinity of the Illeginni Islet target site. Pre-project surveys and incidental observation data will include, but is not limited to, information such as location, date, time, species, and number of individuals. Reports of no sightings will also be documented when animals are not seen on surveys. Observations will be reported to the USAG-KA Environmental Office, the RTS Range Directorate, the Flight Test Operations Director, and USASMDC. USASMDC and USAG-KA Environmental Office will maintain records of these observations and USASMDC will distribute survey reports to the RMI Environmental Protection Authority, NMFS, and the Service within 6 months of completion of each fiscal year.
- A helicopter survey or fixed-wing aircraft overflight in the vicinity of Illeginni Islet target site will be conducted during the week prior to tests and as close to launch as safely practical to survey for sea turtles.
- If a sea turtle nest or nesting activity is observed or reported before a flight test, the USAG-KA Environmental Engineer or USASMDC will coordinate with the Service and NMFS on appropriate conservation measures to implement prior to the flight test launch.
- If a basking sea turtle is observed during pre-test surveys or activities, the animal will be observed to determine if it leaves the area on its own before the test flight. If basking sea turtles do not leave the terminal impact area immediately prior to launch, USAG-KA Environmental Office or USASMDC will coordinate with the Service and NMFS on appropriate measures to protect basking sea turtles.
- During pre-flight set-up, post-test recovery and cleanup, should personnel observe highly mobile endangered, threatened, or other protected species in the area, work will be delayed until such species leave the area of their own volition.
- Test personnel will be briefed on all the measures and conservation requirements listed in Section 2.2 of the Biological Assessment and the requirement to adhere to them during test activities.

Analysis of Effects

Consequences of the Proposed Action on Sea Turtles

Green sea turtles may haul out and nest on any sandy beach area in the Pacific Islands. Hawksbill sea turtles exhibit a wide tolerance for nesting substrate (ranging from sandy beach to crushed coral). Green sea turtles and hawksbill sea turtles typically place nests under or near vegetation. Both species exhibit strong nest site fidelity. Nesting occurs on beaches from May through

Mr. Weldon H. Hill Jr.

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November, peaking in June to September. Basking, a behavior commonly observed in green sea turtles in the Hawaiian Archipelago (Central North Pacific DPS), is not known to occur but may occur in other areas in the Pacific. Threats to sea turtles include disturbance of basking (green sea turtles only) and nesting activity; crushing of adults, eggs, and hatchlings as a result of human activity and from heavy equipment; entrapment of adults and hatchlings that may be prevented from accessing nesting areas or their oceanic habitats; disorientation of hatchlings; and destruction of nests.

Suitable nesting habitats on Illeginni Islet occur in sandy areas that are mostly submerged during daily high tides; however, may be present during lower tides. Sea turtle presence (i.e., green sea turtles basking, tracks, or nest pits) has not been observed on Illeginni Islet in over 27 years based on survey data from 1998 to 2010. The most recent observations of nest pits were documented in 1996, from an unknown sea turtle species.

Daily hightide information indicates that suitable sea turtle nesting areas are mostly submerged one to two times a day on Illeginni Islet. In addition, because green and hawksbill sea turtle activity on the islet have not been documented in over 27 years, it is highly unlikely for the species to be present or attempt to nest within the proposed project area. Lastly, implementation of the above described conservation measures and identified in the Biological Assessment, includes measures that will prevent disorientation of nesting sea turtles females from increased human activity at night during nesting season; crushing of adults, eggs, and hatchlings; entrapment of sea turtles; and nest destruction from impact of payload at target site. Therefore, we expect that impacts to sea turtles as a result of project activities to be highly unlikely to occur; and thus, project impacts to be discountable.

Summary

Based on your project description and proposed implementation of your conservation measures effects from the action are considered discountable. Because project impacts are discountable, we concur with your determination that the proposed project may affect, but is not likely to adversely affect the CWP DPS of the green sea turtle and hawksbill sea turtle.

Reinitiation of this consultation is required and shall be requested by the Federal agency or by the Service, where discretionary Federal involvement or control over the proposed action has been retained or is authorized by law and:

- 1) If new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered;
- 2) If the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this written concurrence; or
- 3) If a new species is listed or critical habitat designated that may be affected by the identified action.

We appreciate your efforts to conserve endangered species. If you have questions regarding this response, please contact Joy Browning, Fish and Wildlife Biologist (phone: 808-210-6137,

Mr. Weldon H. Hill Jr.

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email: joy_browning@fws.gov). When referring to this project, please include this reference number: 2024-0050167-S7-001.

Sincerely,

JINY KIM
Digitally signed
by JINY KIM
Date: 2024.03.05
17:43:09 -10'00'

Island Team Manager
O‘ahu, Kaua‘i, Northwest Hawaiian Islands and
American Samoa

cc: U.S. Army Garrison Kwajalein Atoll

E.2.5 Request for UES Section 3-4.5 Consultation with NMFS



REF: TO
ATTENTION OF

DEPARTMENT OF THE ARMY
U.S. ARMY SPACE AND MISSILE DEFENSE COMMAND
POST OFFICE BOX 1500
HUNTSVILLE, ALABAMA 35807-3801

December 8, 2023

Steve Kolinski, PhD
National Marine Fisheries Service
Pacific Islands Regional Office
1845 Wasp Boulevard, Building 176
Honolulu, HI 96818

Re: Request for Initiation of Consultation under Section 3-4.5 of the UES for Navy Conventional Prompt Strike Weapon System Flight Tests Activities at Kwajalein Atoll

Dear Dr. Kolinski,

The United States Army Space and Missile Defense Command (USASMDC) is assisting the Department of the Navy Strategic Systems Programs, the Action Proponent, in evaluating the effects of proposed Navy Conventional Prompt Strike (CPS) Weapon System Flight Tests activities. The Action Proponent has determined that proposed activities at Kwajalein Atoll may affect and are likely to adversely affect species listed as consultation species under the *Environmental Standards and Procedures for United States Army Kwajalein Atoll (USAKA) Activities in the Republic of the Marshall Islands (UES)* and requests consultation with your office under Section 3-4.5 of the UES.

The Proposed Action consists of conducting Navy CPS weapon system (missile) flight tests in both Atlantic and Pacific Ocean regions. Testing would involve up to eight flight test launches per year from various sea-based launch locations conducted over a 10-year period. All flight tests would be at-sea missile tests launched from existing naval vessels operating in Pacific and Atlantic broad ocean areas (BOAs). After launch, flight test activities would include vehicle flight over the Pacific and/or Atlantic Oceans and would involve splashdown of spent boosters and fairings in Pacific and Atlantic BOAs. Navy CPS flight test payloads would impact at target sites in the BOA and in the Republic of the Marshall Islands (RMI). Within the RMI, payload target sites include the deep-water Kwajalein Missile Impact Scoring System test range and a land site on Illeginni Islet at the Ronald Reagan Ballistic Missile Defense Test Site.

USASMDC and the Navy have prepared a Biological Assessment to evaluate the effects of the Proposed Action on species listed as consultation species under Section 3-4 of the UES. As described in the enclosed Navy CPS Weapon System Flight Tests Biological Assessment for Activities at Kwajalein Atoll, a number of UES protected species occur or have the potential to occur in the Action Area and we have evaluated the effects of the Proposed Action on these species and their habitats. The enclosed Biological Assessment addresses only the portions of the Proposed Action in and over RMI territory, including territorial waters. The Action Proponent plans to prepare a separate biological evaluation where necessary to comply with requirements under Section 7 of the Endangered Species Act for the portions of the Proposed Action that

would take place in and over U.S. territory or within international waters. Since proposed activities within U.S. territorial and international waters would occur in both the Pacific and Atlantic regions, the Action Proponent plans to consult with the National Marine Fisheries Service, National Office of Protected Resources, Interagency Cooperation Division for those activities.

Based on analyses of all of the potential stressors resulting from the Proposed Action, the Navy has determined that the Proposed Action would have “no effect” on 15 coral species (*Acanthastrea brevis*, *Acropora aculeus*, *A. aspera*, *A. dendrum*, *A. listeri*, *A. speciosa*, *A. tenella*, *A. vaughani*, *Alveopora verrilliana*, *Leptoseris incrustans*, *Montipora caliculata*, *Pavona cactus*, *P. decussata*, *Turbinaria mesenterina*, and *T. stellulata*) and two mollusk species (*Pinctada margaritifera* and *Tridacna gigas*) listed as consultation species under the UES. These species are not known to occur in the portion of the Action Area where they might be exposed to stressors resulting from the Proposed Action.

The Navy has determined that the Proposed Action “may affect but is not likely to adversely affect” 16 cetacean species, two sea turtle species, and six fish species listed as consultation species under the UES in the Action Area. The species that may be but are not likely to be adversely affected by the Proposed Action include the cetaceans *Balaenoptera musculus*, *B. physalus*, *Delphinus delphis*, *Feresa attenuata*, *Globicephala macrorhynchus*, *Grampus griseus*, *Kogia breviceps*, the Western North Pacific Distinct Population Segment (DPS) of *Megaptera novaeangliae*, *Mesoplodon densirostris*, *Orcinus orca*, *Peponocephala electra*, *Physeter macrocephalus*, *Stenella attenuata*, *S. coeruleoalba*, *S. longirostris*, and *Tursiops truncatus*; the Central West Pacific DPS of green turtle (*Chelonia mydas*); the hawksbill turtle (*Eretmochelys imbricata*); and the fish *Alopias superciliosus*, *Carcharhinus longimanus*, *Mobula alfredi*, *M. birostris*, *Sphyrna lewini*, and *Thunnus orientalis*. Based on the analysis in the enclosed Biological Assessment, all effects of the Proposed Action on these species would be insignificant or discountable.

The Navy has determined that the Proposed Action “may affect and is likely to adversely affect” six coral species, three mollusk species, and one fish species listed as consultation species under the UES. The species likely to be adversely affected by the Proposed Action are the corals *Acropora microclados*, *A. polystoma*, *Cyphastrea agassizi*, *Heliopora coerulea*, *Pavona cactus*, and *Turbinaria reniformis*; the mollusks *Hippopus hippopus*, *Rochia nilotica*, and *Tridacna squamosa*; and the fish *Cheilinus undulatus*. Based on the analysis presented in the enclosed Biological Assessment, the Proposed Action may adversely affect up to 15,156 coral colonies, 120 individual mollusks, and 10 adult and 150 juvenile humphead wrasse.

Because of the potential for adverse effects to UES protected species, the USASMDC, on behalf of the Navy, requests initiation of formal consultation with the National Marine Fisheries Service under Section 3-4.5 of the UES for potential effects of the Proposed Action on species listed as consultation species under the UES. We would greatly appreciate acknowledgement in writing

(electronic mail will be sufficient) that all necessary information has been received and that the consultation has been initiated.

I am also providing copies of this letter and the Biological Assessment to Ms. Moriana Phillip, Republic of the Marshall Islands Environmental Protection Authority – Majuro; Mr. Michael Desilets, U.S. Army Corps of Engineers - Honolulu; Ms. Angela Sandoval, U.S. Environmental Protection Agency – Region 9; and Dr. Dan Polhemus, U.S. Fish and Wildlife Service, Pacific Islands Fish and Wildlife Office.

Please contact David Fuller in my office, USASMD Environmental Division, regarding this consultation request at 256-955-5585 or david.g.fuller6.civ@army.mil.

Sincerely,

HILL.WELDON.H.JR.1216862682 Digitally signed by HILL.WELDON.H.JR.1216862682
Date: 2023.12.06 10:50:33 -06'00'
Weldon H. Hill, Jr.
Deputy Chief of Staff, Engineer
U.S. Army Space and Missile Defense Command

Enclosure: Navy CPS Weapon System Flight Tests Biological Assessment for Activities at Kwajalein Atoll

E.2.6 Request for ESA Section 7 Consultation with NMFS



REPLY TO
ATTENTION OF

DEPARTMENT OF THE ARMY
U.S. ARMY SPACE AND MISSILE DEFENSE COMMAND
POST OFFICE BOX 1500
HUNTSVILLE, ALABAMA 35807-3801

January 29, 2024

Tanya Dobrzynski
Chief, Interagency Cooperation Division
Office of Protected Resources
NOAA's National Marine Fisheries Service
1315 East-West Highway
Silver Spring, MD 20910

Re: Request for Initiation of Consultation under section 7 of the Endangered Species Act for
Navy Conventional Prompt Strike Weapon System Flight Tests Activities

Dear Tanya Dobrzynski:

The United States Army Space and Missile Defense Command (USASMDC) is assisting the Department of the Navy Strategic Systems Programs, the Action Proponent, in evaluating the environmental effects of proposed Navy Conventional Prompt Strike (CPS) Weapon System Flight Tests activities. The Action Proponent has determined that proposed activities in the Atlantic and Pacific Oceans may affect but are not likely to adversely affect species listed under the Endangered Species Act (ESA) and requests consultation with your office under section 7 of the ESA.

The Proposed Action consists of conducting Navy CPS weapon system (missile) flight tests in both Atlantic and Pacific Ocean regions. Testing would involve up to eight flight test launches per year from various sea-based launch locations conducted over a 10-year period. All flight tests would be at-sea missile tests launched from existing naval vessels operating in Pacific and Atlantic broad ocean areas (BOAs). After launch, flight test activities would include vehicle flight over the Pacific and/or Atlantic Oceans and would involve splashdown of spent boosters and fairings in Pacific and Atlantic BOAs. Navy CPS flight test payloads would impact at target sites in the BOA and in the Republic of the Marshall Islands (RMI).

USASMDC and the Navy have prepared a Biological Evaluation to evaluate the effects of the Proposed Action on marine species listed as endangered or threatened under the ESA and on designated critical habitat in the Action Area. As described in the enclosed Navy CPS Weapon System Flight Tests Marine Biological Evaluation, a number of ESA-listed species and designated critical habitats occur or have the potential to occur in the Action Area, and we have evaluated the effects of the Proposed Action on these species and their habitats. The enclosed Biological Evaluation addresses only the portions of the Proposed Action in the Atlantic and Pacific BOAs. The Action Proponent has prepared a separate biological assessment as necessary

to comply with requirements under the *Environmental Standards and Procedures for United States Army Kwajalein Atoll (USAKA) Activities in the Republic of the Marshall Islands (UES)* for the portions of the Proposed Action that would take place in and over RMI territory, including RMI territorial waters. Since The National Marine Fisheries Service (NMFS), Pacific Islands Regional Office (PIRO) is a designated UES Appropriate Agency, the Action Proponent is consulting separately with the NMFS PIRO Protected Resources Division for those proposed activities within the RMI that might affect UES-listed consultation species, which include all ESA-listed species in the RMI.

As described in the enclosed Biological Evaluation, a number of ESA-listed species under the jurisdiction of NMFS occur or have the potential to occur in the BOA Action Area. Based on analyses of all the potential stressors resulting from the Proposed Action, the Action Proponents have determined that the Proposed Action may affect but is not likely to adversely affect the ESA-listed species considered in the Biological Evaluation. Listed populations of 29 marine species may be, but are not likely to be adversely affected by the Proposed Action: sei whales (*Balaenoptera borealis*), blue whales (*Balaenoptera musculus*), fin whales (*Balaenoptera physalus*), gray whales (*Eschrichtius robustus*), North Atlantic right whales (*Eubalaena glacialis*), North Pacific right whales (*Eubalaena japonica*), humpback whales (*Megaptera novaeangliae*), sperm whales (*Physeter macrocephalus*), false killer whales (*Pseudorca crassidens*), Guadalupe fur seals (*Arctocephalus townsendi*), Steller sea lions (*Eumetopias jubatus*), Hawaiian monk seals (*Neomonachus schauinslandi*), loggerhead sea turtles (*Caretta caretta*), green sea turtles (*Chelonia mydas*), leatherback sea turtles (*Dermochelys coriacea*), hawksbill sea turtles (*Eretmochelys imbricata*), Kemp's ridley sea turtles (*Lepidochelys kempi*), olive ridley sea turtles (*Lepidochelys olivacea*), Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*), oceanic whitetip sharks (*Carcharhinus longimanus*), giant manta rays (*Mobula birostris*), chum salmon (*Oncorhynchus keta*), coho salmon (*Oncorhynchus kisutch*), steelhead trout (*Oncorhynchus mykiss*), sockeye salmon (*Oncorhynchus nerka*), chinook salmon (*Oncorhynchus tshawytscha*), smalltooth sawfish (*Pristis pectinata*), Atlantic salmon (*Salmo salar*), and scalloped hammerhead sharks (*Sphyrna lewini*).

The Action Proponents have also determined that the Proposed Action would have no effect on designated critical habitat for the Central America distinct population segment (DPS) and Mexico DPS of humpback whales, designated *Sargassum* habitat for loggerhead turtles, proposed critical habitat for the North Atlantic DPS of green turtles, and designated critical habitat for leatherback turtles.

Our supporting analysis is provided in the enclosed Biological Evaluation. We request initiation of informal consultation under section 7 of the ESA and request your written concurrence if you agree with our determinations. We would greatly appreciate acknowledgement in writing (electronic mail will be sufficient) that all necessary information has been received and that the consultation has been initiated.

Please contact David Fuller in my office, USASMD Environmental Division, regarding this consultation request at 256-955-5585 or david.g.fuller6.civ@army.mil.

Sincerely,

HILL.WELDON.H.JR.1216862682 Digitally signed by HILL.WELDON.H.JR.1216862682
Date: 2024.01.30 11:16:51 -06'00'
Weldon H. Hill, Jr.
Deputy Chief of Staff, Engineer
U.S. Army Space and Missile Defense Command

Enclosure: Marine Biological Evaluation for Navy Conventional Prompt Strike Weapon System
Flight Tests

E.2.7 NMFS UES Section 3-4.5 and ESA Section 7 Consultation Initiation Letter



U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Pacific Islands Regional Office
1845 Wasp Blvd., Bldg 176
Honolulu, Hawai'i 96818
(808) 725-5000 • Fax: (808) 725-5215

July 3, 2024

Weldon H. Hill, Jr.
U.S. Army Space and Missile Defense Command
Post Office Box 1500
Huntsville, AL 35807-3801

Re: Initiation of formal consultation under 7(a)(2) of the Endangered Species Act and the Environmental Standards and Procedures for U.S. Army Kwajalein Atoll Activities for the Navy Conventional Prompt Strike Weapon System Flight Tests Activities

Dear Mr. Hill:

Thank you for your December 8, 2023, letter requesting initiation of formal consultation with NOAA's National Marine Fisheries Service (NMFS) Pacific Island Regional Office's Protected Resources Division (PRD) pursuant to section 3-4 of Environmental Standards and Procedures for U.S. Army Kwajalein Atoll (USAKA) activities in the Republic of Marshall Islands (UES, 17th Edition) for the Navy CPS Weapon System Flight Tests Activities. On December 20, 2023, we requested a meeting to discuss the species list and technical information related to the project. All parties met on January 11, 2024, where it was agreed that a supplement to the BA was needed.

On January 29, 2024, a consultation request pursuant to section 7(a)(2) of the Endangered Species Act was received by NMFS's Office of Protected Resources (OPR). On February 6, 2024, NMFS OPR sent a request for a meeting to discuss technical information and provide technical assistance related to the ESA portion of the project. On February 13, 2024, USASMDC, Navy, and NMFS OPR met resulting in the need for an updated BA.

On March 11, 2024, OPR and PRD met to discuss the consultation requirements under the ESA and UES. On April 5, 2024, all parties met and it was decided that only one ESA-UES consultation would be conducted due to the CPS test activities being a single project, with NMFS PRD leading the consultation. An addendum to the USAKA BA was received on April 5, 2024. On May 30, 2024 we received the updated ESA BA. On June 11, 2024 NMFS responded with additional technical questions related to vessel transit and two additional species. On July 3, 2024 we received the necessary information to evaluate the proposed action and, per your request, acknowledge the initiation of formal consultation as of July 3, 2024.

Section 161 of the Compact of Free Association requires that the U.S. apply standards that are substantially similar to the ESA. Section 7 of the ESA allows the Services up to 90 calendar days to conclude consultation; by regulation, we have an additional 45 calendar days to prepare our Biological Opinion (unless we mutually agree to an extension). Similarly, section 3-4.5.3 (e) of the UES allows the Services 135 to conclude consultation. Therefore, we expect to provide our

biological opinion to you no later than November 15, 2024 (135 days from initiation of consultation).

While not specified in the UES, the ESA requires that after initiation of formal consultation, the Action Agency may not make any irreversible or irretrievable commitment of resources that would preclude the formulation or implementation of any reasonable and prudent alternatives that would avoid violating section 7(a)(2) (50 CFR 402.09). This prohibition is in force during the consultation process and continues until the requirements of sections 3-4 are met.

If you have any questions or concerns about this letter, please contact Kristina Dauterman, at 808-725-5136 or kristina.dauterman@noaa.gov.

Sincerely,

Ron Dean Digitally signed by Ron Dean
Date: 2024.07.03 10:17:29
+10'00'

Ron Dean
Chief, Interagency Cooperation Branch
Protected Resources Division

Cc: S. Kolinski (NMFS)
R. Driskell (NMFS)
D. Fuller (USASMDC)
D. Hasley (USASMDC)
NMFS File No.: PIRO-2023-03074
PIRO Reference No.: I-PI-23-2255-DG

E.2.8 NMFS UES Section 3-4.5 and ESA Section 7 Consultation Conclusion Correspondence

From: [Ron Dean - NOAA Federal](#)
To: [Fuller, David G CIV USARMY SMDC \(USA\)](#); [Hasley, David C CIV USARMY SMDC \(USA\)](#); [jamiyo.mack@ssp.navy.mil](#); [Chauvey, Patrick Robert CIV USARMY IMCOM AEC \(USA\)](#); [Karen Hoksbergen - KFS](#)
Cc: [Steve Kolinski - NOAA Federal](#); [Dan Polhemus](#); [rmiepaues@gmail.com](#); [Mariana Phillip](#); [Sandoval, Angela@epa.gov](#); [Michael.E.Desilets@usace.army.mil](#); [Kristina Dauterman - NOAA Federal](#); [Dawn Golden - NOAA Federal](#); [Joshua Rudolph - NOAA Federal](#); [Stefanie Gutierrez - NOAA Federal](#)
Subject: Final Biological Opinion regarding proposed U.S. Space Missile Defense Command's Navy weapon flight testing activities in the Marshall Islands
Date: Tuesday, November 5, 2024 2:29:01 PM
Attachments: [PIRO-2023-03074_508.pdf](#)

Dear Team,

NOAA Fisheries has signed a no-jeopardy biological opinion regarding proposed Conventional Prompt Strike Weapon System Flight Tests Activities in the Republic of the Marshall Islands.

In the biological opinion, we determined the authorization of the Conventional Prompt Strike Weapon System Flight Tests Activities as currently managed may cause “take” in the form of harm that results from direct contact, to these species.

After careful evaluation, NOAA Fisheries has determined that the effects of the flight test activities may adversely affect 12 corals, fish, and invertebrate species that are protected under the U.S. Army Kwajalein Atoll Environmental Standards (UES). However, the effects of the proposed action do not appreciably contribute to the extinction risk of these species nor impede their recovery.

The species include: the UES-listed *Acropora microclados*, *Acropora polystoma*, *Cyphastrea agassizi*, *Cyphastrea agassizi*, *Pavona venosa*, *Turbinaria reniformis*, humphead wrasse, bumphead parrotfish, top shell snail, UES and proposed Endangered Species Act (ESA) threatened *Hippopus hippopus*, UES and proposed ESA threatened *Tridacna squamosa* and *Tridacna maxima*. Both *T. squamosa* and *T. maxima* are listed solely based on appearance under ESA section 4(e) and were added to the UES of consultation species effective July 25, 2024.

NOAA Fisheries developed and is implementing one reasonable and prudent measure to minimize incidental take of these species associated with the test flight program. This measure ensures that the U.S. Army Space and Missile Defense Command and the Department of the Navy Strategic Systems Programs have a monitoring and reporting program sufficient to confirm that extent of take is not exceeded, and that the terms and conditions in this incidental take statement are effective in minimizing incidental take.

It is our opinion that these reasonable and prudent measures, and the terms and conditions that implement them, will allow NOAA Fisheries to protect these species while continuing to play an important role in the region’s national security.

Should you have any questions, please feel free to contact me.

Respectfully,

-Ron Dean

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Ron Dean

Chief, Interagency Cooperation Branch
Protected Resources Division
NOAA Fisheries | U.S. Department of Commerce
1845 Wasp Blvd., Bldg 176, Room 2884
Honolulu, HI 96818
Office: (808) 725-5140
www.fisheries.noaa.gov

E.2.9 Request for EFH Consultation with NMFS



REPLY TO
ATTENTION OF

DEPARTMENT OF THE ARMY
U.S. ARMY SPACE AND MISSILE DEFENSE COMMAND
POST OFFICE BOX 1500
HUNTSVILLE, ALABAMA 35807-3801

Environmental Division

July 30, 2024

Alexandria Barkman, PhD
EFH Consulting Biologist
National Marine Fisheries Service
Pacific Islands Regional Office Habitat Conservation Division
1845 Wasp Boulevard, Building 176
Honolulu, HI 96818

Re: Request for Initiation of Abbreviated Essential Fish Habitat Consultation under Section 305(b)(2) of the Magnuson-Stevens Fishery Conservation and Management Act for Navy Conventional Prompt Strike Weapon System Flight Tests Activities

Dear Dr. Barkman,

The United States Army Space and Missile Defense Command (USASMDC) is assisting the Department of the Navy Strategic Systems Programs, the Action Proponent, in evaluating the environmental effects of proposed Navy Conventional Prompt Strike (CPS) Weapon System Flight Tests. The Action Proponent has determined that CPS flight test activities, specifically flight tests with at-sea launches within the Hawaiian U.S. exclusive economic zone (EEZ), have the potential to affect Essential Fish Habitat (EFH) designated under the Magnuson-Stevens Fishery Conservation and Management Act (MSA). Because the Proposed Action may affect EFH in the Hawaiian U.S. EEZ, we request abbreviated consultation with your office under Section 305(b)(2) of the MSA on behalf of the Action Proponent.

The Proposed Action consists of conducting Navy CPS weapon system (missile) flight tests in both Atlantic and Pacific Ocean regions. Testing would involve up to eight flight test launches per year from various sea-based launch locations conducted over a 10-year period. All flight tests would be at-sea missile tests launched from existing naval vessels operating in Pacific and Atlantic broad ocean areas (BOAs). After launch, flight test activities would include vehicle flight over the Pacific and/or Atlantic Oceans and would involve splashdown of spent boosters and fairings in Pacific and Atlantic BOAs. Navy CPS flight test payloads would impact at target sites in the BOA and in the Republic of the Marshall Islands. Within the Hawaiian EEZ (out to 370 kilometers [200 nautical miles] from the territorial sea baseline), Navy CPS flight test activities would potentially include vessel operations, at-sea weapon system launch, vehicle overflight, and stage 1 booster splashdown.

The Navy has prepared an EFH Assessment to evaluate the effects of the Proposed Action on designated EFH within the Hawaiian U.S. EEZ. As described in the enclosed Navy CPS Weapon System Flight Tests EFH Assessment, both water column and benthic EFH for several Management Unit Species (MUS) occur within the Action Area and we have evaluated the effects of the Proposed Action on these the EFH components for these MUS. The enclosed EFH

Assessment addresses only the portions of the Proposed Action in and over the Hawaiian Islands U.S. EEZ (the Action Area).

Based on analyses of all the potential stressors resulting from the Proposed Action, the Action Proponents have determined that the Proposed Action would have no more than minimal adverse effects on EFH and would not result in adverse effects which would reduce the quantity or quality of EFH in the Action Area. All potential adverse effects of the Proposed Action on designated EFH would be undetectable, unmeasurable, or extremely unlikely to occur.

Because of the potential for adverse effects to EFH in the Hawaiian Islands U.S. EEZ, USASMDC, on behalf of the Action Proponent, requests initiation of abbreviated consultation with the National Marine Fisheries Service Pacific Islands Regional Office Habitat Conservation Division under Section 305(b)(2) of the MSA and 50 CFR 600.920. We request your concurrence that the Proposed Action would have no more than minimal adverse effects to EFH. We would greatly appreciate acknowledgement in writing (electronic mail will be sufficient) that all necessary information has been received and that the consultation has been initiated.

Please contact David Fuller in my office, USASMDC Environmental Division, regarding this consultation request at 256-955-5585 or david.g.fuller6.civ@army.mil.

Sincerely,

HILL.WELDON.H.JR.1216862682 Digitally signed by HILL.WELDON.H.JR.1216862682
Date: 2024.07.30 11:23:51 -05'00'
Weldon H. Hill, Jr.
Deputy Chief of Staff, Engineer
U.S. Army Space and Missile Defense Command

Enclosure: Navy Conventional Prompt Strike Weapon System Flight Tests Essential Fish Habitat Assessment

E.2.10 NMFS EFH Consultation Recommendations

From: "Alexandria Barkman - NOAA Federal" <alexandria.barkman@noaa.gov>
Date: Tuesday, August 27, 2024 at 6:02:17 PM
To: "Fuller, David G CIV USARMY SMDC (USA)" <david.g.fuller6.civ@army.mil>
Subject: Re: EFH consultation request for Navy Conventional Prompt Strike Weapon System Flight Tests

Aloha Mr. David Fuller,

The National Marine Fisheries Service, Pacific Islands Regional Office Habitat Conservation Division (NMFS) received a request from the U.S. Army Space & Missile Defense Command (USASMDC) for an abbreviated Essential Fish Habitat (EFH) consultation for the Department of the Navy's (Navy's) Conventional Prompt Strike (CPS) Weapon System Flight Tests within the Hawaiian Exclusive Economic Zone (EEZ) on August 1, 2024. The EFH Assessment (EFHA) was prepared by the Navy Strategic Systems Programs (the action proponent) with the assistance of the USASMDC, in cooperation with Navy Facilities Engineering Systems Command, U. S. Fleet Forces, and U. S. Pacific Fleet. The Navy has proposed to include and adhere to standard operating procedures that include best management practices (BMPs) that, when implemented, will ensure that most adverse effects to EFH will be no more than minimal. We are providing a conservation recommendation under the EFH provisions within Section 305(b)(2) of the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act). Adherence to this conservation recommendation will help you ensure that adverse effects are avoided and minimized.

Project Description

The Proposed Action consists of conducting Navy Conventional Prompt Strike (CPS) weapon system (missile) flight tests within broad Atlantic and Pacific Ocean areas. The EFHA evaluated the potential effects of proposed activities within the Hawaiian U.S. EEZ. Testing would involve up to eight flight test launches per year over a 10-year period beginning in 2025. Missiles would be launched from various sea-based locations from existing naval vessels. . The proposed CPS flight test vehicle, referred to as an All-Up-Round (AUR) missile, consists of a two-stage booster system and payload adapter. The AUR missile body is approximately 30 feet (ft) (10 meters [m]) long and 3 ft (1 m) in diameter. The AUR first- and second-stage rocket motors would contain a total of up to 9,000 kilograms (20,000 pounds) of rocket propellant. During the boost phase following launch of the AUR, the first-stage motor would burn out downrange and separate from the second stage. First-stage boosters would splash down in the Pacific Broad Ocean Area downrange from launch and as far as 330 nm

(611 km) offshore. Second-stage boosters and payload adapters would splash down outside of EEZs in international waters. A Flight Termination System on the test vehicle will be used if the vehicle were to deviate from its course or problems occurs during flight that requires termination.

The Proposed Action may result in spent stage 1 booster splashdown within designated EFH with a maximum direct contact/damage area of up to 54 ft² (5 m²) for a single test. If the maximum of eight stage 1 booster splashdowns take place in the Hawaiian EEZ per year, there would be a maximum direct contact/damage area of approximately 430 ft² (40 m²) per year. In the event of a flight test failure scenario where the CPS AUR fell intact into the ocean near the launch point, the direct contact area would be up to 320 ft² (30 m²). Flight test failures may occur in up to 20% of flight tests, resulting in a maximum direct contact/damage area of approximately 650 ft² (60 m²) per year for failure scenarios. Navy CPS flight test activities would potentially include vessel operations, at-sea weapon system launch, vehicle overflight, and stage 1 booster splashdown.

Essential Fish Habitat

Portions of the water column and benthos of the action area are defined as EFH and support various life stage for the management unit species (MUS) identified under the Western Pacific Regional Fishery Management Council's Pelagic and Hawai'i Archipelago Fishery Ecosystem Plans (FEPs) (WPFMC 2009a, 2009b). The marine water column from the surface to a depth of 3,280 ft from the shoreline to the outer boundary of the EEZ (200 nautical miles), and the seafloor from the shoreline out to a depth of 2,296 ft around each of the Hawaiian Islands, have been designated as EFH. As such, the water column and bottom of the Pacific Ocean around the Hawaiian Islands are designated as EFH, and support various life stages for MUS. The MUS and life stages found in these waters include eggs, larvae, juveniles, and adults of Bottomfish, Crustacean, and Pelagic MUS. Specific types of habitat considered as EFH include coral reef, patch reefs, hard substrate, artificial substrate, seagrass beds, soft substrate, lagoon, estuarine, surge zone, deep-slope terraces and pelagic/open ocean.

Action Area Baseline Condition

The proposed Action Area intersects with approximately 348,300 miles² of the Hawaiian Islands EEZ. The Action Area includes a diversity of pelagic and benthic habitats which support diverse marine communities. Water depths in the proposed stage 1 booster splashdown and launch activity areas within the Hawaiian Islands EEZ are between 230 ft (70 m) and 19,000 ft (5,800 m) deep. The first 3,280 ft (1000 m) of the water column is EFH, and is assumed to be in good condition. The substrate within the booster drop zone is unknown but is likely a highly variable, diverse mix of hard and soft substrates depending on localized depth and geology.

Adverse Effects

NMFS anticipates that proposed activities may adversely affect MUS, but will have no

more than a minimal impact to EFH. Potential effects include physical damage, increased turbidity, and increased risk of pollutants, chemicals, and invasive species to the water column and benthos.

Physical Damage/Removal (physical stressor): Splashdowns of stage one booster components, spread of debris, or a launch failure may result in breakage or dislocation (i.e., mortality), or sub-lethal tissue abrasion of corals and benthic habitat components. Corals, which are primarily responsible for the structural complexity of coral reefs, are particularly vulnerable to physical damage because their slow-growing carbonate skeleton is relatively brittle and their polyps are easily damaged. In general, lobate, encrusting, and other massive colony morphologies tend to withstand breakage better than foliose, table, plating, and branching morphologies; more fragile forms tend to have higher growth rates (Rützler 2001). Reduction of topographic complexity in the habitats of the coral reef ecosystem reduces biodiversity and productivity (Alvarez-Filip et al. 2009). Literature reviews (Newell et al. 1998; ICES 2016) suggest that the successional marine community requires at least six to eight months to recover back to initial levels after removal, although broken coral will take many years to regrow if significant biomass is removed (Minton 2013).

Sedimentation (pollution stressor): Splashdowns may cause a temporary increase in suspended sediment when the boosters land on the benthos. Coral reef organisms are easily smothered by sediment and can experience both physiological and lethal responses to concentrations below 10 milligrams (mg)/cm²/day and 10 mg/Liter (L) (Tuttle and Donahue 2022). Increased turbidity can cause changes in fish behavior, including altered predator-prey relationships (Higham et al. 2015). The effect of the temporary increases in turbidity from the splash down should be no more than minimal.

Chemical Contamination (pollution stressor): Chemical pollutants may enter the marine environment from unspent rocket propellant, motors, batteries, and other system components that are not recovered. Contaminants can have a variety of lethal and sublethal effects on habitat-forming marine organisms, including alteration of growth, interference with reproduction, disruption of metabolic processes, and changes in behavior. These adverse effects can cascade through ecosystems, altering species composition and ecosystem functions and services. Some pollutants are environmentally persistent and can take years or even decades to biodegrade, and others can bioaccumulate or biomagnify through the food chain, eventually posing a direct threat to human health. Contaminant concentrations in fishes are linked to locations with increased urbanization and military history (Nalley et al. 2021; 2023).

Invasive Species (biological stressor): Increased vessel traffic may lead to the spread or introduction of invasive species on vessel hulls. Introduced species are organisms that have been moved, intentionally or unintentionally, into areas where they do not naturally occur. Invasive species rapidly increase in abundance to the point that they come to dominate their new environment, creating adverse ecological effects to other species of the ecosystem and the

functions and services it may provide (Goldberg and Wilkinson 2004). Invasive species can decrease species diversity, change trophic structure, and diminish physical structure, but adverse effects are highly variable and species-specific.

Best Management Practices

The Navy has proposed a number of Standard Operating Procedures and Mitigation Measures that will minimize impacts of the action on EFH. The mitigation measures include:

- Vessel operations would not involve any intentional ocean discharges of fuel, toxic wastes, or plastics and other solid wastes that could potentially harm marine life.
- Test launches would be conducted at least 93 km (50 nm) and up to 370 km (200 nm) offshore.
- No launches or missile component splashdown would occur within marine national monuments or national marine sanctuaries located in the ocean study areas. No anchoring would occur within marine national monuments or national marine sanctuaries.
- With the exception of target sites at Kwajalein Atoll, no missile components are expected to splash down or impact within territorial seas or non-U.S. EEZs.
- Stage 1 booster splashdowns would occur in deep ocean waters downrange from launch and as far as 330 nm offshore of any land areas.
- All stage 2 splashdown and payload target sites would be outside of EEZs in international waters.
- Support ship personnel would search for any visible floating test debris after payload impact. Any visible components of the payload or other test debris found floating would be recovered, as much as practicable.
- When within a 320-m (350-yard) radius of live hard bottom, shallow-water coral reefs, precious coral beds, artificial reefs, and shipwrecks, the Navy would not place anchors or mooring devices on the seafloor (except in designated locations).

NMFS Concerns

The splashdowns of rocket booster stages may result in adverse effects to EFH from physical damage to benthic organisms, including corals or seagrass, that occur at depths of less than 2,297 ft (700 m) in the EEZ from sinking debris. Less than 1% of the action area is shallower than 2,297 ft (700 m) deep, so adverse effects of stage one splashdowns on benthic EFH is expected to be very rare. If a stage from a missile did land in an area with coral reef, the effect could be significant, but the chance of that happening has been minimized. Chemical contamination of the water column up to 3,280 ft (1000 m) may result from unburned solid propellant residue, batteries, and petroleum from recovery vessels. Increased vessel traffic may cause introduction of invasive species from vessel hulls. Vessel travel for launch related activities may result in spread of invasive species from the hulls of vessels.

Conservation Recommendation

NMFS provides the following EFH conservation recommendation pursuant to 50 CFR

600.920 that when implemented—along with the provided standard operating procedures and mitigation measures—will ensure that potential adverse effects to EFH are avoided and minimized:

Conservation Recommendation 1: Ensure all vessel hulls do not pose a risk of introducing new invasive species and will not increase abundance of invasive species present at the project location

Conclusion

NMFS appreciates the coordination and consultation on the CPS flight tests. We have provided an EFH conservation recommendation that when implemented—along with the CPS proposed mitigation measures—will ensure that potential adverse effects to EFH are avoided and minimized.

Please be advised that regulations (Section 305(b)(4)(B)) to implement the EFH provisions of the Magnuson-Stevens Act require that federal activities agencies provide a written response to this letter within 30 days of its receipt and, a preliminary response is acceptable if more time is needed. The final response must include a description of measures to be required to avoid, mitigate, or offset the adverse effects of the proposed activities. If the response is inconsistent with our EFH conservation recommendation, an explanation of the reason for not implementing the recommendation must be provided at least 10 days prior to final approval of the activities.

Please do not hesitate to contact me with any comments, questions or to request further technical assistance at alexandria.barkman@noaa.gov.

Regards,

Alex

References

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Alexandria Barkman, PhD.

EFH Consulting Biologist, PIRO Habitat Conservation Division
National Marine Fisheries Service | U.S. Department of Commerce
Office: (808) 725-5150

www.fisheries.noaa.gov

E.2.11 EFH Consultation Recommendations Response

From: [Fuller, David G CIV USARMY SMDC \(USA\)](#)
To: [Barkman, Alexandria L CIV \(USA\)](#)
Cc: [Karen Hoksbergen - KFS](#)
Subject: EFH consultation request for Navy Conventional Prompt Strike Weapon System Flight Tests
Date: Tuesday, September 10, 2024 9:26:29 AM

Aloha Dr. Barkman,

U.S. Army Space & Missile Defense Command (USASMDC) received your Essential Fish Habitat (EFH) consultation conclusions and conservation recommendations for the Navy Conventional Prompt Strike (CPS) Flight Tests Program on August 28, 2024. The Action Proponent, the Department of the Navy Strategic Systems Programs, has accepted your conservation recommendation to ensure all vessel hulls do not pose a risk of introducing new invasive species and will not increase abundance of invasive species present at the project location. The Navy has standard operating procedures in place to periodically clean and inspect vessel hulls which would be implanted as part of the Proposed Navy CPS Flight Tests Action. The Navy will implement the standard operating procedure that “Vessel hulls will be periodically inspected and cleaned to reduce the risk of introduction or spread of invasive species” to ensure that potential adverse effects to EFH are avoided and minimized. With this written acceptance of the National Marine Fisheries Service’s conservation recommendations, we consider the subject EFH consultation complete.

Thank you for the timely consultation conclusions and recommendations.

V/r,
David

David Fuller
NEPA Program Manager
Environmental Division/NEPA Branch
U.S. Army Space & Missile Defense Command
Redstone Arsenal, AL
(c) 256.425.2016
(o) 256.955.5585
david.g.fuller6.civ@army.mil

E.2.12 NMFS EFH Consultation Conclusion Response

From: [Alexandria Barkman - NOAA Federal](#)
To: [Fuller, David G CIV USARMY SMDC \(USA\)](#)
Cc: [Karen Hoksbergen - KFS](#)
Subject: Re: EFH consultation request for Navy Conventional Prompt Strike Weapon System Flight Tests
Date: Tuesday, September 10, 2024 6:00:50 PM

Aloha David,
Thank you for agreeing to implement the conservation recommendation. The Essential Fish Habitat consultation for the Navy Conventional Prompt Strike Flight Tests Program is complete.

Regards,
Alex

--

Alexandria Barkman, PhD.
EFH Consulting Biologist, PIRO Habitat Conservation Division
National Marine Fisheries Service | U.S. Department of Commerce
Office: (808) 725-5150

www.fisheries.noaa.gov

E.3. UES Compliance Correspondence

E.3.1 Example of NPA Submission Letter to UES Appropriate Agencies

Note: In addition to the NMFS letter in this section, a similar letter or memo was also sent to RMIEPA, USFWS, USACE, and USEPA.



REPLY TO
ATTENTION OF

DEPARTMENT OF THE ARMY
U.S. ARMY SPACE AND MISSILE DEFENSE COMMAND
POST OFFICE BOX 1500
HUNTSVILLE, ALABAMA 35807-3801

Environmental Division

May 30, 2024

Steve Kolinski, PhD
National Marine Fisheries Service
Pacific Islands Regional Office
1845 Wasp Boulevard, Building 176
Honolulu, HI 96818

Re: Notice of Proposed Activity at United States Army Kwajalein Atoll for Navy Conventional Prompt Strike Weapon System Flight Tests (Control Number NPA-24-SMDC-01)

Dear Dr. Kolinski,

The United States Army Space and Missile Defense Command (USASMD) is assisting the Department of the Navy Strategic Systems Programs, the Action Proponent, in environmental compliance for the proposed Navy Conventional Prompt Strike (CPS) Weapon System Flight Tests program which includes activities at United States Army Kwajalein Atoll (USAKA) in the Republic of the Marshall Islands (RMI). The Action Proponent, in cooperation with USASMD, has determined that proposed activities at Kwajalein Atoll have the potential to affect the USAKA environment and would therefore require a Document of Environmental Protection (DEP) and a Notice of Proposed Activity (NPA) under the *Environmental Standards and Procedures for United States Army Kwajalein Atoll (USAKA) Activities in the Republic of the Marshall Islands* (UES). This letter documents submittal of the NPA for the proposed Navy CPS Weapons System Flight Tests activity.

The Proposed Action consists of conducting Navy CPS weapon system (missile) flight tests in both Atlantic and Pacific Ocean regions. Testing would involve up to eight flight test launches per year from various sea-based launch locations conducted over a 10-year period. All flight tests would be at-sea missile tests launched from existing naval vessels operating in Pacific and Atlantic broad ocean areas (BOAs). After launch, flight test activities would include vehicle flight over the Pacific and/or Atlantic Oceans and would involve splashdown of spent boosters and fairings in Pacific and Atlantic BOAs. Navy CPS flight test payloads would impact at target sites in the BOA and at USAKA. Within the RMI, payload target sites include the deep-water Kwajalein Missile Impact Scoring System test range and a land site on Illeginni Islet at the Ronald Reagan Ballistic Missile Defense Test Site.

The Department of the Navy, with the assistance of USASMD, has prepared a Draft Environmental Assessment (EA) / Overseas Environmental Assessment (OEA) to meet requirements of the U.S. National Environmental Policy Act (NEPA). The U.S. Army Garrison-

Kwajalein Atoll (USAG-KA), USASMDC, and U.S. Navy are submitting the Draft EA/OEA as the NPA for this project to meet their compliance requirements under the UES, Sixteenth Edition, in accordance with UES Section (§) 2-17.3.8(a)(1). This NPA submission, which includes the *Navy CPS Weapon System Flight Tests Draft EA/OEA* and the *Navy CPS Weapon System Flight Tests Biological Assessment for Activities at Kwajalein Atoll*, includes all information to meet requirements of UES § 2-17.3.2 as detailed in **Table 1**. The Draft EA/OEA also contains an evaluation of the potential effects of the Proposed Action on species and habitats listed in UES Appendices 3-4C and 3-4D, and these materials serve as the preliminary review in accordance with UES § 3-4.6.3 coordination procedures.

Table 1. Details of NPA Requirements Fulfillment for the Proposed Activity

UES § 2-17.3.2 Part	Description of NPA Requirement	Status or Location in the Navy CPS Flight Tests Draft EA/OEA		
		EA/OEA Volume	Section (s)	Page(s)
(a)	Type of activity.	Volume 1	2.1	2-1
(b)	Location of activity.	Volume 1	2.1.4.3 & 2.1.4.4	2-10 to 2-12
(c)	Technical description of the activity, including the chemical processes used.	Volume 1	2.1	2-1 to 2-16
(d)	Technical drawing of the activity, including schematics.	Volume 1	2.1	2-1 to 2-16
(e)	Environmental areas potentially affected by the activity (air, water, hazardous waste, pesticides, cultural resources, etc.).	Volume 1	1.6	1-6 to 1-10
(f)	Description of the environmental setting of the activity.	Volume 1	3.2	3-22 to 3-43
(g)	Analysis of the effect of the activity on the environmental area in the absence of environmental controls.	Volume 1	4.2.2 & 4.3.2.2	4-12 to 4-25, 4-31 to 4-36
		Volume 2	D.2	D-20 to D-30
(h)	Technical description and analysis of the environmental controls used in the activity.	Volume 2	Appendix C	C-1 to C-11
(i)	Dispersion model for modeling air sources.	Not Applicable – The proposed activity does not involve construction or operation of new or major stationary air pollution sources which would require dispersion modeling. Additional air quality impact analyses are found within the EA/OEA in:		
		Volume 1	4.2.2.1	4-12 to 4-13
(j)	Analysis of waste discharge for point-source waste discharges to water (UES § 3-2.7.1).	Not Applicable – The proposed activity does not involve point-source waste discharges as defined in the UES.		
(k)	Information required under UES § 3-6.5.3 and 3-6.5.7 for treatment, storage, or disposal facilities.	Volume 1	3.2.6.2	3-40
			4.2.2.6	4-21 to 4-23
(l)	Biological assessment [UES § 3-4.5.3(c)] if endangered resources may be affected.	In the <i>Navy CPS Weapon System Flight Tests Biological Assessment for Activities at Kwajalein Atoll</i> , which is included in this NPA submission.		
(m)	Information on receiving-water quality for water discharges.	Volume 1	4.2.2.5	4-20 to 4-21

UES § 2-17.3.2 Part	Description of NPA Requirement	Status or Location in the Navy CPS Flight Tests Draft EA/OEA		
		EA/OEA Volume	Section (s)	Page(s)
(n)	Information on marine life, currents, and other characteristics of an ocean disposal site (UES §§ 3-4 and 3-5).	Not Applicable – The proposed activity does not include direct or secondary ocean disposal of wastes. Material and debris resulting from routine tests conducted at or near USAG-KA are not considered ocean disposal under the standards of UES §3-5.5(a)(3). Similarly, routine discharges of effluent incidental to the propulsion of vessels or the operation of motor-driven equipment on vessels is not considered ocean disposal under the standards of UES §3-5.5(a)(1).		
(o)	Information on marine life and environment in areas where dredging or filling will take place (UES §§ 3-2, 3-4, and 3-5).	Not Applicable – No ocean dredging or filling will take place for proposed test flight activities.		
(p)	Species and numbers of migratory birds and other wildlife species and habitats that may be affected (UES § 3-4.6.3(c), UES Appendix 3-4C and UES Appendix 3-4D).	Volume 1	3.2.3 & 4.2.2.3	3-24 to 3-35, 4-13 to 4-17
		Volume 2	D.2	D-20 to D-30
(q)	Analysis of climate change and its potential impacts on the activity, and a description of related limitations and requirements.	Volume 1	3.2.1, 4.2.2.1, & 4.3.2.2	3-22 to 3-23, 4-12 to 4-13, 4-31 to 4-36
		Additional analysis of the cumulative effects of climate change on biological resources can be found in Section 5.0, pages 61 to 65 of the <i>Navy CPS Weapon System Flight Tests Biological Assessment for Activities at Kwajalein Atoll</i> , which is included in this NPA submission.		

We request your review of the enclosed Draft EA/OEA and Biological Assessment sections identified in Table 1 as the NPA. Because the Proposed Action may affect species and habitats listed in UES Appendices 3-4C and 3-4D we also request your review of the Draft EA/OEA as the preliminary review. If you have any environmental comments and recommendations for the proposed activity, we request that you submit them by September 1, 2024, or within 90 days of receipt of the NPA. A blank environmental comments and recommendations matrix is enclosed for your use. Please submit all comments and recommendations to David Fuller in my office at david.g.fuller6.civ@army.mil with a copy to Karen Hoksbergen at hoksbergenk@kfs-llc.com. As a note, this requested NPA review is occurring concurrently with the NEPA public review period of the Draft EA/OEA and any comments or recommendations received on the EA/OEA will be considered along with public comments during preparation of the final EA/OEA. For any technical questions regarding the NPA or the review request, please contact me, David Hasley, at 256-955-4170 or david.c.hasley.civ@army.mil. We would greatly appreciate acknowledgement in writing (electronic mail will be sufficient) that the NPA has been received.

Copies of this letter and the NPA submission materials will be distributed to Ms. Moriana Phillip, Republic of the Marshall Islands Environmental Protection Authority – Majuro; Mr. Michael Desilets, U.S. Army Corps of Engineers – Honolulu; Ms. Angela Sandoval, U.S. Environmental Protection Agency – Region 9; Dr. Dan Polhemus, U.S. Fish and Wildlife Service, Pacific Islands Fish and Wildlife Office; Mr. Gus Aljure, U.S. Army Garrison –

Kwajalein Atoll, Environmental Division, and Mr. Patrick Chauvey, U.S. Army Garrison –
Kwajalein Atoll, Directorate of Public Works.

Sincerely,

HASLEY.DAVID.
C.1230984308

Digitally signed by
HASLEY.DAVID.C.1230984308
Date: 2024.05.22 10:22:28
-05'00'

David Hasley
USASMDC Environmental Division Chief
UES Co-Chairperson

Enclosures (3):

- (1) Navy CPS Weapon System Flight Tests Draft Environmental Assessment / Overseas
Environmental Assessment
- (2) Navy CPS Weapon System Flight Tests Biological Assessment for Activities at
Kwajalein Atoll
- (3) Blank Environmental Comments and Recommendations Form