Report No. DODIG-2022-083

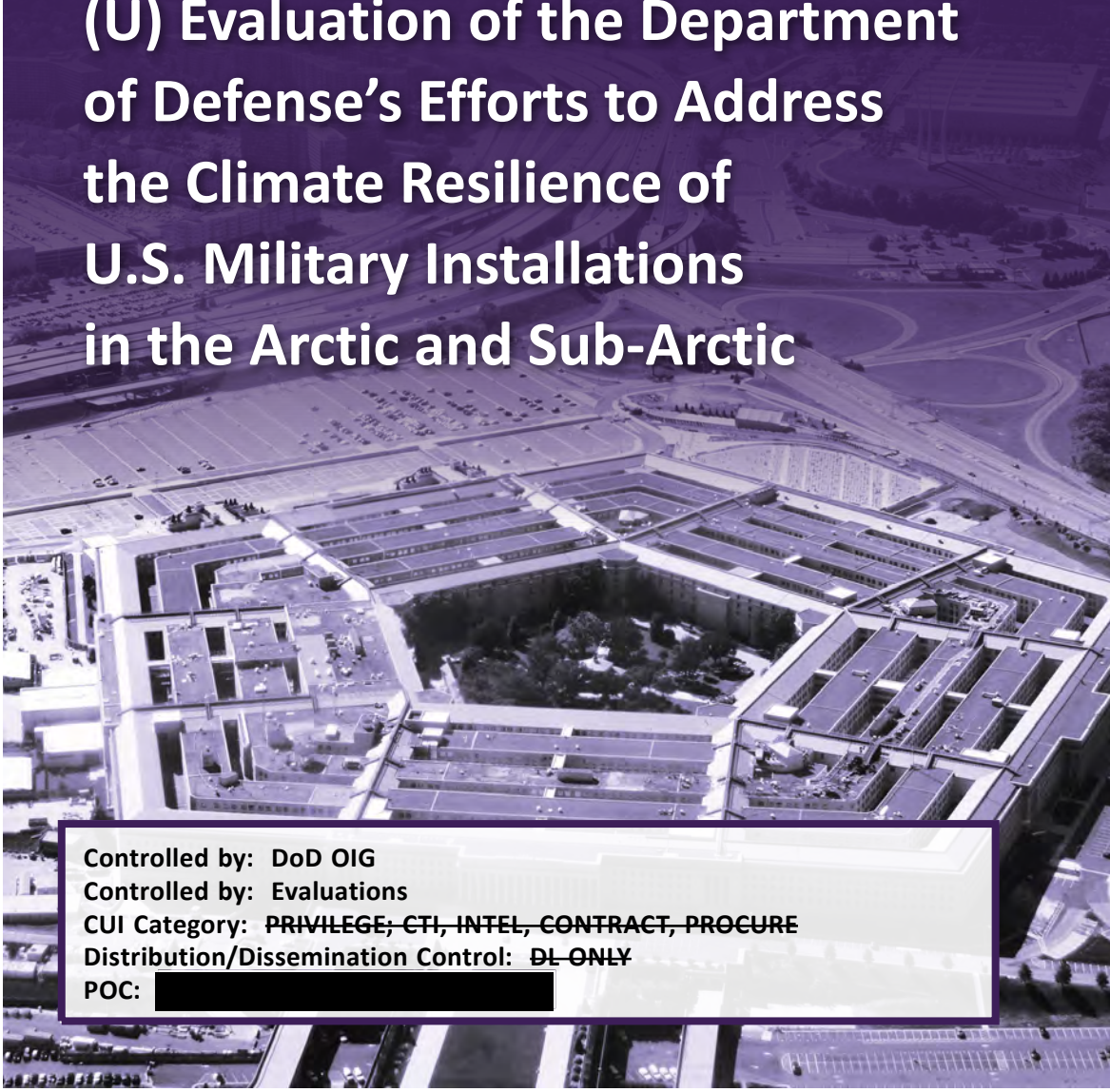
~~CUI~~

INSPECTOR GENERAL

U.S. Department of Defense

APRIL 13, 2022

(U) Evaluation of the Department of Defense's Efforts to Address the Climate Resilience of U.S. Military Installations in the Arctic and Sub-Arctic



Controlled by: DoD OIG
Controlled by: Evaluations
CUI Category: ~~PRIVILEGE; CTI, INTEL, CONTRACT, PROCURE~~
Distribution/Dissemination Control: ~~DL ONLY~~
POC: [redacted]

INTEGRITY ★ INDEPENDENCE★ EXCELLENCE

~~CUI~~


INSPECTOR GENERAL
INTEGRITY
EFFICIENCY
DEPARTMENT OF DEFENSE

(U) Results in Brief

(U) Evaluation of the Department of Defense's Efforts to Address the Climate Resilience of U.S. Military Installations in the Arctic and Sub-Arctic

APRIL 13, 2022

(U) Objective

(U) The objective of this evaluation was to determine the extent to which the DoD has addressed the climate resilience of U.S. military installations in the Arctic and sub-Arctic.

(U) Background

(U) In the past 5 years, extreme weather and changing climate have caused hundreds of billions of dollars' worth of damage in the United States. In 2019, a DoD report to Congress on the effects of climate change on military installations called the effects of a changing climate a national security issue, with potential impacts to DoD missions, operational plans, and installations. Public law, DoD directives, and recently released DoD Facilities Criteria require DoD installations to address climate and energy risks and threats to installation infrastructure, assets, and missions.

(U) The extent of climate change is more significant in the Arctic than in most other parts of the world. The DoD's Arctic Strategy recognizes that the Arctic has direct implications for U.S. national security interests. The DoD is investing in resilient installation infrastructure and assets in the Arctic and sub-Arctic regions to support increased Arctic operations and enhanced Arctic awareness.

(U) Finding

(U) U.S. military installation leaders at the six Arctic and sub-Arctic installations we visited did not conduct installation resilience assessments and planning required by DoD directive and public law. DoD Directive 4715.21, "Climate Change Adaptation and Resilience" (2016), requires DoD Components to integrate climate change considerations into DoD Component policy, guidance, plans, and operations. In addition, 10 U.S.C. § 2864 (2020) requires commanders of major military installations to identify, assess, and develop plans to address military installation resilience and environmental risks and threats to assets, infrastructure, and mission. However, most installation leaders at the six installations we visited in the Arctic and sub-Arctic region were unfamiliar with military installation resilience planning requirements, processes, and tools, and did not comply with requirements to identify current and projected environmental risks, vulnerabilities, and mitigation measures or incorporate these considerations into plans and operations.

(U) These conditions occurred because of a lack of DoD and Service Component emphasis on installation climate resilience. Specifically,

- (U) military installation leaders focused on existing weather and energy challenges rather than analyzing their installations' infrastructure, assets, and mission exposure and vulnerability to climate change;
- (U) the DoD and Service Components did not provide guidance for implementing military installation resilience assessments; and
- (U) installation leaders lacked resources to analyze and assess climate change.

~~(CUI)~~ [redacted]

(U) Results in Brief

(U) Evaluation of the Department of Defense's Efforts to Address the Climate Resilience of U.S. Military Installations in the Arctic and Sub-Arctic

(U) Recommendations

(U) We recommend that the Assistant Secretary of Defense for Energy, Installations, and Environment incorporate 10 U.S.C. §2864 (2020) master planning requirements for major military installations into DoD climate change adaptation and resilience policy.

(U) We further recommend that the Assistant Secretary of the Army for Installations, Energy and Environment:

- (U) establish priorities, develop milestones, and identify planning and training resources for the Department of the Army; and
- (U) establish Department of the Army installation orders requiring installation commanders to identify climate risks, conduct assessments, determine climate vulnerabilities, and identify and plan for climate resilience measures for current and future climate changes in installation master plans, in accordance with DoD Directive 4715.21, Army Directive 2020-08, and 10 U.S.C. § 2864 (2020).

(U) Finally, we recommend that the Assistant Secretary of the Air Force for Energy, Installations, and Environment:

- (U) establish priorities, develop milestones, and identify planning and training resources; and
- (U) establish Department of the Air Force installation orders requiring installation commanders to identify climate risks, conduct assessments, determine climate vulnerabilities, and identify and plan for climate resilience measures for current and future climate changes in installation master plans, in accordance with DoD Directive 4715.21, Air Force Instruction 32-1015, and 10 U.S.C. § 2864 (2020).

(U) Management Comments and Our Response

(U) The Senior Executive performing the duties of the Assistant Secretary of Defense for Energy, Installations, and Environment concurred with the recommendation to incorporate Federal master planning requirements into DoD environmental policy. On October 7, 2021, the White House released the "DoD Climate Adaptation Plan," which fully addressed our recommendation. Therefore, this recommendation is closed.

(U) The Assistant Secretary of the Army for Installations, Energy and Environment concurred with the recommendation to develop and establish priorities, milestones, orders, measures, and planning and training resources for Army installation commanders to use to identify climate-related risks and vulnerabilities. The Army published its Climate Strategy on February 8, 2022, and is beginning work on its Climate Strategy Implementation Plan. Additionally, the Army will publish a directive requiring the Army Components to use Installation Climate Resilience Planning to update Installation Master Plans no later than FY 2023. Comments from the Assistant Secretary of the Army for Installations, Energy and Environment met the intent of the recommendation; therefore, this recommendation is resolved, but will remain open. We will close the recommendation when the Army publishes its Climate Strategy Implementation Plan and its Climate Resilience Planning Directive.

(U) The Assistant Secretary of the Air Force for Energy, Installations, and Environment concurred with the recommendation to establish priorities, develop milestones, and identify planning and training resources for the Department of the Air Force. He stated that he was developing priorities and milestones for completion of Installation Climate Resilience Plans for major Department

(U) Results in Brief

(U) Evaluation of the Department of Defense's Efforts to Address the Climate Resilience of U.S. Military Installations in the Arctic and Sub-Arctic

(U) Comments (cont'd)

(U) of the Air Force installations. Comments from the Assistant Secretary met the intent of the recommendation. We consider this recommendation resolved, but it will remain open. We will close the recommendation when the Assistant Secretary of the Air Force for Energy, Installations, and Environment publishes the Department of the Air Force priorities and milestones for completion of the Installation Climate Resilience Plans for the major Air Force installations.

(U) The Assistant Secretary of the Air Force for Energy, Installations, and Environment partially concurred with the recommendation requiring installation commanders to identify climate risks, conduct assessments, determine climate vulnerabilities, and identify and plan for current and future climate resilience measures. He stated that issuing installation orders was the responsibility of the commanders of Air Force Major Commands and Space Force Field Commands. Comments from the Assistant Secretary addressed the specifics of the recommendation. We consider this recommendation resolved, but it will remain open. We request that the Assistant Secretary, as a member of the Department of the Air Force Secretariat, oversee the Air Force Major Command and Space Force Field Command installation plans and actions to address the priorities and milestones for climate resilience in installation master plans. We followed up with Office of the Assistant Secretary of the Air Force for Energy, Installations, and Environment officials after receiving their management comments on this recommendation, and they agreed to provide oversight. We will close this recommendation once the Assistant Secretary of the Air Force for Energy, Installations, and Environment provides a Department of the Air Force directive, orders, or other documentation to identify climate risks, conduct assessments, and determine climate vulnerabilities from the Major Commands and Field Commands.

(U) Please see the Recommendations Table on the next page for the status of the recommendations.

(U) Recommendations Table

Management	Recommendations Unresolved	Recommendations Resolved	Recommendations Closed
(U) Assistant Secretary of Defense for Energy, Installations, and Environment			1
(U) Assistant Secretary of the Army for Installations, Energy and Environment		2.a., 2.b.	
(U) Assistant Secretary of the Air Force for Energy, Installations, and Environment		3.a., 3.b.	

Please provide Management Comments by May 13, 2022.

Note: The following categories are used to describe agency management's comments to individual recommendations.

- **Unresolved** – Management has not agreed to implement the recommendation or has not proposed actions that will address the recommendation.
- **Resolved** – Management agreed to implement the recommendation or has proposed actions that will address the underlying finding that generated the recommendation.
- **Closed** – DoD OIG verified that the agreed upon corrective actions were implemented.

INSPECTOR GENERAL
DEPARTMENT OF DEFENSE
4800 MARK CENTER DRIVE
ALEXANDRIA, VIRGINIA 22350-1500

April 13, 2022

(U) MEMORANDUM FOR ASSISTANT SECRETARY OF DEFENSE FOR ENERGY, INSTALLATIONS, AND ENVIRONMENT
ASSISTANT SECRETARY OF THE ARMY FOR INSTALLATIONS, ENERGY AND ENVIRONMENT
ASSISTANT SECRETARY OF THE AIR FORCE FOR ENERGY, INSTALLATIONS, AND ENVIRONMENT

(U) SUBJECT: Evaluation of the Department of Defense's Efforts to Address the Climate Resilience of U.S. Military Installations in the Arctic and Sub-Arctic (Report No. DODIG-2022-083)

This final report provides the results of the DoD Office of Inspector General's evaluation. We previously provided copies of the draft report and requested written comments on the recommendations. We considered management's comments on the draft report when preparing the final report. These comments are included in the report.

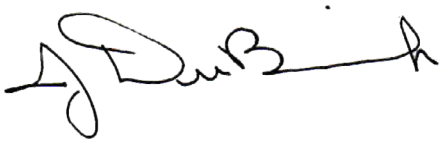
The Senior Executive performing the duties of the Assistant Secretary of Defense for Energy, Installations, and Environment concurred with our recommendation to incorporate master planning requirements for military installations into DOD climate change adaptation and resilience policy. On October 7, 2021, the White House released the Department's "DoD Climate Adaptation Plan," which fully addressed our recommendation. Therefore, this recommendation is closed.

The Assistant Secretary of the Army for Installations, Energy and Environment agreed to address Recommendations 2.a. and 2.b; therefore, we consider the recommendations resolved and open. The Assistant Secretary of the Air Force for Energy, Installations, and Environment agreed to address the specifics of Recommendation 3.a. and 3.b; therefore, we consider the recommendations resolved and open.

As discussed in the Recommendations, Management Comments, and Our Response section of this report, we will close the recommendations when the Assistant Secretary of the Army for Installations, Energy and Environment and the Assistant Secretary of the Air Force for Energy, Installations, and Environment provide documentation that the guidance, policies, and procedures addressing the recommendations have been established and implemented.

DoD Instruction 7650.03 requires that recommendations be resolved promptly. Therefore, please provide us within 30 days your response concerning specific actions in process or alternative corrective actions proposed on the unresolved recommendations.

If you have any questions or would like to meet to discuss the evaluation, please contact [redacted] We appreciate the cooperation and assistance received during the evaluation.



Jefferson L. DuBinok
Acting Assistant Inspector General for
Evaluations Programs, Combatant
Commands, and Overseas
Contingency Operations

(U) Contents


INSPECTOR GENERAL
DEPARTMENT OF DEFENSE
INTEGRITY
EFFICIENCY

(U) Introduction

(U) Objective

(U) The objective of this evaluation was to determine the extent to which the DoD has addressed the climate resilience of U.S. military installations in the Arctic and sub-Arctic.

(U) Background

(U) In the past 5 years, extreme weather and changing climate have caused hundreds of billions of dollars' worth of damage in the United States.[1] The DoD's senior climate adviser stated in July 2021 that "climate change is going to cost us [the DoD] in resources and readiness."[2] In 2019, the DoD reported to Congress on the effects of climate change on 79 military installations in the United States.[3] The report stated that 78 of these DoD installations were vulnerable to the effects of climate change and that:

- (U) about two-thirds of the installations are vulnerable to recurrent flooding,
- (U) more than one-half are vulnerable to drought, and
- (U) about one-half are vulnerable to wildfires.

(U) Additionally, the DoD report stated that the effects of a changing climate are a national security issue, with potential impacts to DoD missions, operational plans, and installations.

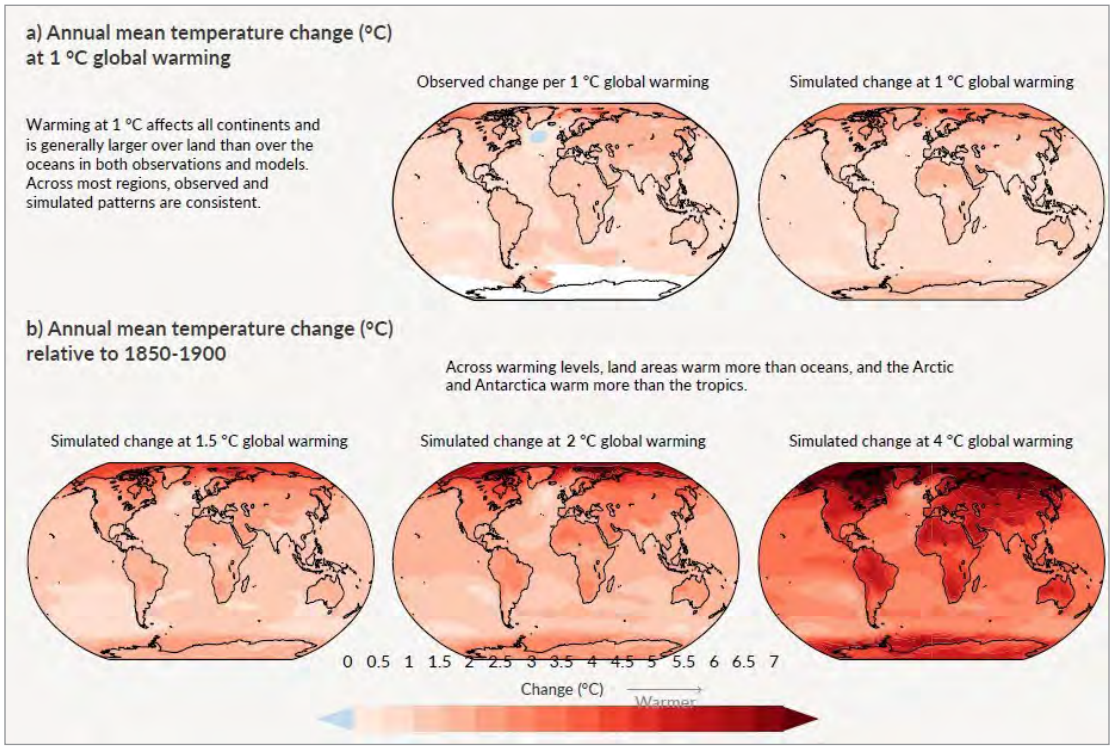
[1] (U) National Oceanic and Atmospheric Administration, National Centers for Environmental Information, "Billion-Dollar Weather and Climate Disasters: Overview," August 30, 2021.

[2] (U) Defensenews.com, "Climate Change is Going to Cost Us: How the US Military is Preparing for Harsher Environments," August 9, 2021.

[3] (U) Office of the Under Secretary of Defense for Acquisition and Sustainment, "Report on Effects of a Changing Climate to the Department of Defense," January 2019. Only one installation, the Pentagon, reported no vulnerabilities to the effects of climate change.

(U) Figure 1, from the 2021 Intergovernmental Panel on Climate Change report, demonstrates that the extent of climate warming is more significant in the Arctic than in most other parts of the world.[4] The report states that it is virtually certain that the Arctic will continue to warm more quickly than the global surface temperature, above two times the rate of global warming. The increased Arctic warming will result in more rainfall, less snowfall, and widespread permafrost thaw in the Arctic and the continued melting of Arctic glaciers and Greenland's ice sheet.[5] The report projects that floods and wildfires will increase in the Arctic through the 21st century.

(U) Figure 1. 2021 Annual Mean Temperature Changes



(U) Source: 2021 Intergovernmental Panel on Climate Change.

[4] (U) Intergovernmental Panel on Climate Change, "Climate Change 2021: The Physical Science Basis," August 7, 2021. Office of the Under Secretary of Defense for Policy, "The 2019 DoD Arctic Strategy," June 2019. The DoD Arctic Strategy uses the definition of the Arctic codified at section 4111, title 15, United States Code. According to 15 U.S.C. § 4111, the term "Arctic" means all United States and foreign territory north of the Arctic Circle and all United States territory north and west of the boundary formed by the Porcupine, Yukon, and Kuskokwim Rivers; all contiguous seas, including the Arctic Ocean and the Beaufort, Bering, and Chukchi Seas; and the Aleutian chain.

[5] (U) According to the DoD's "Report on Effects of a Changing Climate to the Department of Defense," thawing permafrost decreases the structural stability to foundations, buildings, and transportation infrastructure and requires costly mitigation responses that disrupt planning, operations, and budgets.

(U) The DoD's Focus on Climate Change

(U) The DoD has focused on the impacts of climate change for several years. In the 2010 Quadrennial Defense Review (QDR), the DoD recognized that climate change and energy would play significant roles in shaping the future security environment.[6] The 2010 QDR stated that the DoD must complete a comprehensive assessment of all installations to determine the potential impacts of climate change on its missions and adapt as required.

(U) The 2014 QDR more clearly identified climate change as a potential threat for the DoD and, like the 2010 QDR, identified a need for DoD installations to assess potential impacts of climate change on mission and operational resiliency and develop adaptation plans.[7] Additionally, the Secretary of Defense signed the DoD's 2014 Climate Change Adaptation Roadmap, which identified the potential for climate change to affect DoD operations, training, infrastructure, and equipment, and stated that the DoD would review plans with unique climate-related challenges, such as its Arctic Strategy, and modify those plans as needed.[8]

(U) Figure 2. (Left) Storm Damage to Hangar 7 (Exterior), Eareckson Air Station, Alaska
(U) Figure 3. (Right) Storm Damage to Hangar 7 (Interior), Eareckson Air Station, Alaska
(U) Source: 611th Civil Engineering Squadron.

[6] (U) Office of the Secretary of Defense Historical Office, "2010 Quadrennial Defense Review (QDR)," February 2010.

[7] (U) Office of the Secretary of Defense Historical Office, "2014 Quadrennial Defense Review (QDR)," March 2014.

[8] (U) Office of the Assistant Secretary of Defense for Energy, Installations & Environment, "DoD Climate Change Adaptation Roadmap, 2014."

(U) Since 2016, the President, Congress, and the DoD have issued laws, executive orders, directives, and guidance documents, including the examples outlined in the table below, that require the DoD to assess and plan for the impacts of climate change.

Table 1. (U) Climate-Related Requirements for DoD Assessment and Planning for Climate Change

(U) Reference	(U) Date	(U) Summary of Climate-Related Requirements
(U) DoDD 4715.21, "Climate Change Adaptation and Resilience"	January 14, 2016; Change 1 Effective August 31, 2018	Establishes policy and assigns responsibilities to provide the DoD with the resources necessary to assess and manage risks associated with the impacts of climate change.
(U) DoD Arctic Strategy	June 2019	The DoD's assessment of the Arctic security environment, risks posed to U.S. national security interests, DoD Arctic objectives, and the strategic approach by which the DoD will achieve these objectives.
(U) AFI 32-1015, Integrated Installation Planning	July 30, 2019, (Interim Change 1, October 13, 2020), (Corrective Action, January 4, 2021)	Language was added to address installation resilience, to include providing guidance regarding planning for resilience to severe weather and climate hazards, addressing roles and responsibilities of installation weather personnel, and providing clarification regarding updated requirements for the Installation Development Plan, to include an installation climate resilience plan.
(U) 10 USC § 2864*	December 2019	Requires each major military installation master plan to address installation resilience and energy and climate resilience efforts.
(U) Air Force Civil Engineer Severe Weather/Climate Hazard Screening and Risk Assessment Playbook	April 24, 2020	Provides a framework to screen and assess severe weather, climate hazards, and their associated current and future risks.
(U) Army Climate Resilience Handbook	August 2020	Methodology and process to assess climate hazards and risks and steps for how to incorporate this information into existing installation master plans.

Table 1. (U) Climate-Related Requirements for DoD Assessment and Planning for Climate Change (cont'd)

(U) Reference	(U) Date	(U) Summary of Climate-Related Requirements
(U) UFC 2-100-01 Installation Master Planning**	September 30, 2020	Master planning process and product updates, including energy and climate resilience and requirements for military installation resilience components; incorporates climate change effects required by the FY 2020 National Defense Authorization Act.
(U) Executive Order 14008, "Tackling the Climate Crisis at Home and Abroad"	January 27, 2021	Executive Order placing the climate crisis at the forefront of American foreign policy and national security planning. The Executive Order tasks the DoD with developing a strategy to integrate climate impact and risk mitigation into installation master plans.
(U) Secretary of Defense Memorandum, Establishment of the Climate Working Group	March 9, 2021	Directs the establishment of the DoD Climate Working Group.
(U) DoD Installation Exposure to Climate Change at Home and Abroad	April 19, 2021	Identifies climate hazards to DoD installations, which is the first step in addressing the potential physical harm, security impacts, and degradation in readiness resulting from global climate change.

* (U) Section 2864, title 10, United States Code (10 U.S.C. § 2864 [2020]), "Master Plans for Major Military Installations."

** (U) Unified Facilities Criteria.

(U) Source: The DoD OIG.

(U) DoD Directive, Public Law, and Military Service Issuances Require Military Installation Resilience

(U) In 2014, the DoD identified the need to increase its resilience to climate change with the publication of the QDR and the Climate Change Adaptation Roadmap. In 2016, DoD Directive (DoDD) 4715.21 defined resilience as "the ability to anticipate, prepare for, and adapt to changing conditions and withstand, respond to, and recover rapidly from disruptions."[9] Later, in FY 2019, the National Defense Authorization Act defined "military installation resilience" as the capability of a military installation to avoid, prepare for, minimize the effect of, adapt to, and

[9] (U) DoDD 4715.21, "Climate Change Adaptation and Resilience," January 14, 2016, also directs Service Components to assess and manage risks to built and natural infrastructure, including changes as appropriate to installation master planning.

(U) recover from extreme weather events or from changes to environmental conditions that do, or have the potential to, adversely affect the military installation or essential resources outside of the military installation necessary to mission essential functions.[10] Public Law 115-32, "The National Defense Authorization Act for Fiscal Year 2019," section 2805, also defined the term "energy and climate resiliency" as "anticipation, preparation for, and adaptation to utility disruptions and changing environmental conditions and the ability to withstand, respond to, and recover rapidly from utility disruptions while ensuring the sustainment of mission-critical operations" and added the requirement in 10 U.S.C. § 2864 (2020) for installation master plans to address energy and climate resilience efforts.

(U) 10 U.S.C. § 2864 (2020) requires each major military installation master plan to address current and projected risks and threats to resiliency from weather and environmental conditions; assets and infrastructure vulnerable to these risks and threats, with a special emphasis on those that are mission critical; and ongoing or planned infrastructure projects or other measures to mitigate the impacts of the risks and threats.[11] Additionally, Service issuances, such as Air Force Instruction 32-1015 and Army Directive 2020-08, require that military installation leaders maintain resilience against climate hazards.[12]

(U) The DoD's Arctic Strategy and U.S. National Security Prioritize Climate Resilience

(U) The DoD's Arctic Strategy recognizes the importance of the Arctic security environment to U.S. national security. The strategy states that the Arctic is a potential vector for an attack on the U.S. homeland, a region where Russia and China are operating more freely, and a strategic corridor for DoD forces between the Indo-Pacific and Europe. With warming temperatures in the Arctic, diminishing Arctic sea ice is opening new shipping lanes and increasing access to natural resources during the summer months.

---

10 (U) 10 U.S.C. § 101 (e) (8), "Definitions."

11 (U) According to 10 U.S.C. § 2864, the term "major military installation" is defined in accordance with how the DoD Base Structure Report defines "large site": having a plant replacement value of $2.067 billion or more. According to the Director of DASD Real Property Accountability, prior to the FY 2020 DoD Base Structure Report, relative size summaries were based on reported plant replacement value (PRV); however, the report no longer uses these categories. Of the six installations in this Evaluation report, only Clear Space Force Station is below the plant replacement value threshold. Clear Space Force Station's PRV was valued at $823 million as of September 30, 2021, but the station also has a new $1.5 billion radar undergoing initial operational capability tests in 2021.

12 (U) Air Force Instruction 32-1015, "Integrated Installation Planning, "Corrective Action, January 4, 2021, directs installation commanders to assess and manage risks associated with the effects of severe weather and a changing climate on built and natural infrastructure.

(U) Army Directive 2020-08, "U.S. Army Installation Policy To Address Threats Caused by Changing Climate and Extreme Weather," September 11, 2020, directs garrison commanders to update installation plans and procedures to address the projected impacts of changing climate and extreme weather and incorporate the results into all appropriate plans.

(U) The DoD Arctic Strategy aligns with the Interim National Security Strategy to prioritize defense investments in climate resiliency.[13] The DoD's Arctic Strategy also aligns with the following National Defense Strategy priorities and objectives:

- (U) invest in long-term strategic competition with Russia and China, and
- (U) defend the homeland from attack.[14]

(U) Finally, the DoD's Arctic Strategy states that the Arctic has direct implications for U.S. national security interests, both as an avenue for attacks on the U.S. homeland and for U.S. power projection. According to its Arctic Strategy, the DoD will assess investments to enhance existing regional infrastructure that will enable operational flexibility to project forces and support combat aircraft, missile defense, early warning assets, and cold weather training.

(U) Our evaluation examined the climate resiliency of five sub-Arctic installations in Alaska and one Arctic installation in Greenland:

- (U) Joint Base Elmendorf-Richardson (JBER), Alaska[15]
- (U) Clear Space Force Station, Alaska[16]
- (U) Eielson Air Force Base (AFB), Alaska
- (U) Fort Wainwright, Alaska
- (U) Fort Greely, Alaska
- (U) Thule Air Base (AB), Greenland

(U) The DoD, Air Force, and Army Arctic Strategies Require Military Installation Resilience

(U) The DoD's Arctic Strategy states that the DoD must address the impacts of weather in current and future operations and build resilience by factoring effects of the environment into mission planning and execution.[17] The DoD's Arctic Strategy emphasizes the requirement to build resilient infrastructure to support increasing Arctic operations and enhancing Arctic awareness.

~~(CUI)~~ [redacted]

[13] (U) The White House, "Interim National Security Strategic Guidance," March 2021.

[14] (U) Office of the Secretary of Defense, "Summary of the 2018 National Defense Strategy," 2018.

[15] (U) For this evaluation, JBER includes satellite locations operated by the 611th Civil Engineering Squadron, to include Eareckson Air Station and 15 radar stations.

[16] (U) The Department of the Air Force defines Clear Space Force Station and Thule Air Base as Geographically Separated Units, without full civil engineer squadrons located on the installation. Civil engineering support for Clear Space Force Station is provided by Buckley Space Force Base, Colorado.

[17] (U) Office of the Under Secretary of Defense For Policy, Report To Congress, "DoD Arctic Strategy," June 2019.

~~(CUI)~~ [redacted].[18] The Army's Arctic Strategy includes assessing the impacts of climate change on infrastructure and monitoring the impacts of climate change on training areas and operational requirements.[19] All three strategies highlight the importance of assessment and planning in response to environmental conditions and climate change in the Arctic. [redacted]

[redacted]

(U) The DoD Is Investing in Military Installations Across the Arctic and Sub-Arctic Region

(U) The DoD is planning and executing construction projects at Army, Air Force, and Space Force installations across the Arctic and sub-Arctic region. These projects represent billions of dollars in infrastructure investment to support increased Arctic operations and space awareness. According to the DoD's Arctic Strategy, the DoD's Arctic objectives require building Arctic awareness and the ability to detect threats through effective surveillance of the northern approaches to North America. The DoD's Arctic Strategy also includes prepositioning equipment and supplies to support global mobility, power projection, and quick

[18] (U) United States Air Force, "Department of the Air Force, Arctic Strategy," July 21, 2020.
[19] (U) United States Army, "United States Army, Regaining Arctic Dominance," January 19, 2021.

(U) response to contingencies in the region. The strategy states that the DoD will continue to take steps to build the resilience of infrastructure in the face of environmental hazards.

(U) THULE AB

~~(CUI)~~ Thule AB in Greenland is the DoD's northernmost installation. The Department of the Air Force (DAF) is planning major investment upgrades at Thule AB through FY 2025. According to information collected from a U.S. Army Corps of Engineers (USACE) Thule AB project manager, [redacted]

~~(CUI)~~ [redacted]

(U) CLEAR SPACE FORCE STATION

~~(CUI)~~ [redacted]

~~(CUI)~~ [redacted].[20]

(U) The Joint Base Elmendorf-Richardson Methane Plant

(U) The Anchorage Landfill Gas-to-Energy Project, or Joint Base Elmendorf-Richardson (JBER) Methane Plant, is a three-way partnership between the DoD, the Municipality of Anchorage, and Doyon Utilities LLC, to create electrical power from methane gas produced by a municipal landfill adjacent to JBER. Methane gas produced from biodegradation of organic waste at the solid waste landfill is harnessed for electricity production at Doyon's power plant on JBER. Since the methane plant began operation in 2013, the plant has reduced greenhouse gas emissions by approximately 7,800 metric tons annually.

(U) According to a 673rd Civil Engineer Group official at JBER, the methane plant provides the Fort Richardson side of JBER with approximately 50 percent of its electrical power. Additionally, the plant provides JBER as a whole with approximately 26 percent of its electrical power. A private utility company in Anchorage supplies the remaining electricity to JBER.

(U) Figure 5. (left) Methane Power Plant
(U) Figure 6. (right) Methane-Powered Generators
(U) Source: Municipality of Anchorage, AK. (U) Source: Municipality of Anchorage, AK.

[20] (U) According to the Clear Space Force Station Base Civil Engineer, operational testing of the radar paused during the summer to accomplish other tasks that require the radar to be powered down. The Base Civil Engineer stated that the Missile Defense Agency will establish a new initial operational capability date.

(U) The landfill is expected to produce usable methane gas for at least 50 years while saving JBER approximately $30 million on energy costs over the life of the project. Another benefit of the partnership is that JBER exceeds renewable energy goals established by Section 203, Energy Policy Act of 2005, which requires Federal agencies to use renewable energy to meet at least 7.5 percent of total fiscal year electric consumption.

(U) EIELSON AFB

~~(CUI)~~ [redacted]

~~(CUI)~~ [redacted]

(U) FORT GREELY

~~(CUI)~~ [redacted]

(U) Key Stakeholder Roles and Responsibilities in DoD's Military Installation Resilience Efforts

(U) The DoD's infrastructure investment in the Arctic and the DoD's and Service Components' commitments to military installation resilience in support of Arctic strategies requires coordination and guidance from the Service Components and

(U) knowledge of current and future resilience assessments from installation leaders.[21] Several key stakeholders have roles and responsibilities in the DoD's military installation resilience efforts.

(U) Assistant Secretary of Defense for Energy, Installations, and Environment

(U) The Assistant Secretary of Defense for Energy, Installations, and Environment (ASD[EI&E]) serves as the principal advisor to the Under Secretary of Defense for Acquisition and Sustainment for all matters relating to energy, installations, and the environment, including operational and facilities energy, renewable energy, energy management, and energy resilience. The ASD(EI&E) also oversees installation maintenance, management, sustainment, construction, and resilience; and environmental planning, compliance, cleanup, resilience, and natural and cultural resource protection.

(U) Deputy Assistant Secretary of Defense, Environment and Energy Resilience

(U) The Deputy Assistant Secretary of Defense, Environment and Energy Resilience (DASD[E&ER]), under the ASD(EI&E), provides governance of programs that enable resilience, including management oversight of programs related to climate change. Additionally, the DASD(E&ER) oversees the Defense Climate Assessment Tool (DCAT) program and is developing a DCAT training program for the DoD.

(U) Assistant Secretary of the Army for Installations, Energy and Environment

(U) The Assistant Secretary of the Army for Installations, Energy and Environment (ASA[IE&E]) is responsible for the oversight of Army Directive 2020-08, as well as for establishing strategic direction for the Army's planning, programming, budgeting, and execution of requirements to address these threats.[22]

(U) Assistant Secretary of the Air Force for Energy, Installations, and Environment

(U) The Assistant Secretary of the Air Force for Energy, Installations, and Environment (SAF/IE) has authority for all matters related to Air Force Integrated Installation Planning. The SAF/IE is responsible for providing policy, strategic

[21] (U) "Installation leaders" refers to installation commanders and staff, mission commanders and staff, installation master planners, Air Force base civil engineers, Army Chiefs of Departments of Public Works, and training range planners.

[22] (U) Army Directive 2020-08, "Army Installation Policy to Address Threats Caused by Changing Climate and Extreme Weather," September 11, 2020.

(U) direction, priorities, doctrine, directive guidance, and oversight for the management and execution of Air Force installation programs, including Air Force installation development planning, environmental planning, installation energy resilience, climate adaptation and resilience, and strategic basing. The SAF/IE also provides installation development direction, guidance, and oversight to the U.S. Space Force.

(U) Department of the Air Force Civil Engineer Directorate

(U) The DAF Civil Engineer Directorate includes installation strategy and plans, facility management, energy and environmental management, readiness and sustainment. The directorate leads Air Force civil engineers in providing, operating, maintaining, and protecting sustainable installations by supporting the SAF/IE with the development of policy, strategy, doctrine, and directive guidance. The DAF Civil Engineer Directorate also provides installation development policy, guidance, and oversight to the U.S. Space Force.

(U) The U.S. Space Force Chief Operations Officer

(U) The United States Space Force Chief Operations Officer assists the Secretary of the Air Force, other Secretariat offices, and the Chief of Space Operations in carrying out space operations, intelligence, logistics, cyber defense, force generation and readiness, and nuclear deterrence operations. The United States Space Force Chief Operations Officer establishes and oversees policies to organize, train, and equip those forces for the United States Space Force and DAF.

(U) U.S. Army Corps of Engineers

(U) USACE is responsible for developing the Army Climate Assessment Tool for Army installations and providing a user manual that serves as the primary information source for use of the Army Climate Assessment Tool. USACE follows the Army Climate Resilience Handbook, which serves as a reference for Army users to identify site-specific climate threats and develop resilience measures.

(U) U.S. Army Installation Commanders

(U) According to Army Directive 2020-08, Army installation commanders must assess, plan for, and adapt to the projected impacts of changing climate and extreme weather by adding the results of climate change prediction analysis tools into all facility and infrastructure-related plans, policies, and procedures. Installation commanders are responsible for updating installation plans and procedures to address the projected impacts of changing climate and extreme weather and prioritizing the protection of supplies and facilities, including the constructed and natural infrastructure supporting critical missions.

(U) Department of the Air Force Installation Commanders

(U) According to Air Force Instruction 32-1015, Air Force installation commanders are responsible for developing, maintaining, and updating appropriate installation development and facility planning documents. Additionally, they are responsible for assessing and managing risks to the installation, including risks associated with the effects of severe weather and a changing climate on built and natural infrastructure.

(U) Finding

(U) U.S. Military Installation and Organization Leaders in the Arctic and Sub-Arctic Did Not Conduct Military Installation Resilience Assessments and Planning for Climate Resilience

(U) U.S. military installation leaders at the six Arctic and sub-Arctic installations we visited did not conduct installation resilience assessments and planning required by DoD directive and public law. DoDD 4715.21 requires DoD Components to integrate climate change considerations into DoD Component policy, guidance, plans, and operations. In addition, 10 U.S.C. § 2864 (2020) requires commanders of major military installations to develop plans to address military installation resilience and environmental risks and threats to assets, infrastructure, and mission, and discuss ongoing or planned infrastructure projects or other measures to mitigate the environmental risks and threats.

(U) Most installation leaders at the six installations we visited in the Arctic and sub-Arctic region were unfamiliar with military installation resilience planning requirements, processes, and tools, and installation leaders did not comply with requirements to identify current and projected climate-related environmental risks, vulnerabilities, and risk reduction measures, or incorporate these considerations into plans and operations. These conditions occurred because:

- (U) military installation leaders focused on existing weather and energy challenges rather than analyzing their installations' infrastructure, assets, and mission exposure and vulnerability to climate change;
- (U) the DoD and Service Components did not provide guidance for implementing military installation resilience assessments; and
- (U) installation leaders, including installation master planners, lacked resources to analyze and assess climate change.

~~(CUI)~~ [redacted]

(U) Figure 7. Cracks and Depressions on Runway and Shoulder Caused by Water Thawing and Refreezing, Thule AB, Greenland
(U) Source: The DoD OIG.

(U) U.S Military Installation Leaders in the Arctic and Sub-Arctic Did Not Conduct Military Installation Assessments and Planning for Climate Resilience

(U) U.S. military installation leaders at the six Arctic and sub-Arctic installations we visited did not conduct military installation resilience assessments and planning required by DoD directive and public law. Most installation leaders at the six installations we visited in the Arctic and sub-Arctic region were unfamiliar with military installation resilience planning requirements, processes, and tools. In addition, installation leaders did not comply with requirements to identify current and projected climate-related environmental risks, vulnerabilities, and mitigation measures, or incorporate these considerations into plans and operations. Without assessments of climate change risks and vulnerabilities, installation planners are not able to project the environmental impacts on assets, infrastructure, and missions that the DoD and Service Component Arctic strategies require.

(U) Military Installation Leaders Were Not Familiar With the Requirements, Processes, and Tools for Climate Resilience Planning

(U) Military installation leaders were unfamiliar with military installation resilience planning requirements, processes, and tools. During our interviews with installation leaders in Alaska and Greenland, we found that more than half of the installation commanders, master planners, Department of Public Works (DPW) personnel, civil engineers, and operations personnel were:

- (U) unfamiliar with 10 U.S.C. § 2864 (2020) requirements to assess and project future risks from climate change,
- (U) unfamiliar with their Service's processes for identifying and assessing exposure to climate risks, or
- (U) unfamiliar with the climate assessment tools recommended by the DoD and their Service Component.

(U) Leaders at the installations we visited stated that their Services had not emphasized military installation resilience requirements. These leaders stated that their Services had not provided implementation plans, climate assessment training, or funding to the installations in support of the military installation resilience requirements. DAF officials stated that Congress had not provided appropriations to specifically fund military installation resilience aside from planning and design funding for military construction and unspecified minor military construction in FY 2020 and FY 2021.

(U) Installation Leaders Did Not Assess and Project Future Risks From Climate Change

(U) Most installation leaders were not familiar with the 10 U.S.C. § 2864 (2020) requirements to assess and project future risks from climate change. 10 U.S.C. § 2864 (2020) requires major military installations' master plans to address climate and energy resilience. DoDD 4715.21 also requires DoD military installations to assess and plan for the effects of climate change on installation infrastructure. Additionally, both the FY 2020 National Defense Authorization Act and UFC 2-100-01 require installation professionals to consider, plan for, and minimize or mitigate severe weather and climate risks in Army Installation Master Plans and Air Force IDPs and facility projects.[23] Finally, Army Directive 2020-08

[23] (U) FY 2020 National Defense Authorization Act, Section 2804, "Amendment of Unified Facilities Criteria to Promote Military Installation Resilience, Energy Resilience, Energy and Climate Resiliency, and Cyber Resilience," December 20, 2019. UFC 2-100-01, "Installation Master Planning," September 30, 2020, is the latest update of this document and addresses the requirements from 10 U.S.C. § 2864 (2020). This UFC is for multi-Service use and sets the standards for military installation master plans for all United States Army, Navy, Air Force, and Marine Corps permanent installations. The Air Force Civil Engineer Center was the preparing activity for the 2020 publication. This UFC focused on environmental planning requirements in installation master plans as early as 2012.

(U) and Air Force Instruction 32-1015 require installation commanders to assess the impacts of a changing climate on their installations' constructed and natural installation infrastructure. In addition to statements from installation leaders that their installation planners had not begun to assess and plan for future climate risks, we reviewed and found no evidence of climate resilience assessment and planning in the most current Air Force installation development plans and Army installation master plans for the installations we visited.

(U) Army and Air Force Personnel Did Not Follow Service-Specific Written Guidance for Installation Climate Assessment Planning

(U) The Army and Air Force published reference material and handbooks to explain and guide assessment planning at the installation level. The Army Climate Resilience Handbook contains a four-step process for determining each installation's exposure to hazards and risks from climate change. The Army Climate Resilience Handbook incorporates current and future climate effects on infrastructure, assets, and mission in each installation's climate exposure and vulnerability assessment process.[24] However, leaders at the Army installations we visited stated that they had not conducted assessments and were not familiar with the Army climate assessment process.

(U) In a March 2021 memorandum, the Air Force directed its Arctic and sub-Arctic civil engineer units to use the Air Force Playbook to identify current and future climate hazards and assess current and future climate risks to their installations.[25] The Air Force Playbook uses a three-phase process.[26] Specifically, the DAF Deputy Director of Civil Engineering directed the Air Force and Space Force civil engineers to complete the first two phases, which screen hazards and assess risk.

(U) DAF officials had completed the first two phases. However, in the same March 2021 memorandum, the DAF Deputy Director of Civil Engineering directed these leaders to wait for further instructions to develop installation climate resiliency plans in Phase 3. Phase 3 determines next steps and focuses on planning actions, area development strategies, and future facility siting, among others. Base commanders, master planners, and most base civil engineers at or supporting the Air Force and Space Force installations we visited stated that

[24] (U) United States Army Corps of Engineers, "Army Climate Resilience Handbook," (Change 1), August 2020.

(U) Air Force Civil Engineer Center, "Air Force Civil Engineer Severe Weather/Climate Hazard Screening and Risk Assessment Playbook," April 24, 2020.

[25] (U) HQ USAF/A4C, "Usage of *AF Civil Engineer Severe Weather/Climate Hazard Screening And Risk Assessment Playbook* For Real Property Above 60° Latitude In Support of The DAF Arctic Strategy," March 15, 2021.

[26] (U) The Air Force Playbook's three phases are: (1) Identify climate hazards to the base as a whole, (2) assess overall climate risk to the installation, and (3) identify hazards and risks to facilities and assets on the installation and consider planning for risk mitigation actions.

(U) they did not play a role in the Air Force Playbook assessments at their respective installations and they were unfamiliar with the Air Force process or Air Force Playbook requirements. Rather, a member from the CES or civil engineering group at each installation included in this evaluation completed the Air Force Playbook assessments.

(U) Installation Leaders Did Not Use Available Climate Assessment Tools

(U) In FY 2019, the Office of the DASD(E&ER) began development of the DCAT, based on the already existing Army Climate Assessment Tool (ACAT) developed by USACE.[27] The DASD(E&ER) published a report on April 19, 2021, that explained how the DCAT identifies installation exposure to climate hazards as the first step in determining installation climate vulnerability and compared overall DCAT reports for each Service Component.[28] The DASD(E&ER) also published a DCAT user's "Quick Guide" on a USACE website.

(U) The Army Climate Resilience Handbook uses the ACAT as part of its climate assessment process to determine each Army installation's exposure to the effects of climate change. However, leaders at the Army installations we visited stated that they were not familiar with the ACAT. While the ACAT was an essential component in the Army Climate Resilience Handbook process to identify climate hazards, the Air Force Playbook process offered several alternative resources for determining potential climate exposure. In June 2021, a SAF/IE representative stated that the Air Force was considering alternatives to the DCAT to identify climate hazards.

[27] (U) According to USACE's Army Climate Resilience Handbook, the ACAT provides climate change hazard information at the installation, command, and headquarters levels that is specifically developed for use in the screening-level assessment (of climate hazard exposure) described in the Army Climate Resilience Handbook. The ACAT also includes reports that identify those installations that have the greatest exposure to analyzed climate change hazards. The Office of the Assistant Secretary of Defense (Sustainment) has funded USACE to develop the DCAT by extending its ACAT climate exposure assessment-screening tool to include tabs for Army, Navy, and Air Force to increase understanding of DoD installations' exposure to climate impacts.

[28] (U) Office of the Deputy Assistant Secretary of Defense, Environment and Energy Resilience, "DoD Exposure to Climate Change at Home and Abroad," April 19, 2021.

(U) DoD and Service Components Did Not Emphasize Military Installation Climate Resilience Assessments and Planning

(U) Military installation leaders at the six installations we visited focused on immediate weather and energy challenges instead of future climate risks. Additionally, the DoD and Service Components did not provide guidance for implementing military installation resilience assessments. Finally, installation leaders lacked the resources to analyze and assess climate change.[29]

(U) Military Installation Leaders Focused on Existing Weather and Energy Challenges, but Did Not Analyze Their Installations' Exposure to Future Climate Change Risks

(U) Military installation leaders stated that they identified existing weather and energy challenges; however, they did not analyze their installations' exposure to risks from future climate change. DoDD 4715.21 states that the DoD must be able to adapt current and future operations to address the impacts of climate change to maintain an effective and efficient U.S. military. 10 U.S.C. § 2864 (2020) directs that each major installation's master plan include a resilience component that incorporates risks and threats from changing climate and extreme weather. Both the Army and the Air Force climate assessment and planning processes include exposure to current and future climate risks and hazards in the initial steps of their assessments. We found that the installations in Alaska and Greenland focused primarily on responding to current weather-related risks and challenges.

(U) Installation Officials Identified Current Climate and Energy Risks and Challenges

(U) Officials from the six installations we visited in Alaska and Greenland focused on current climate and energy risks and challenges that affected infrastructure, assets, and mission on their installations. Officials from all six installations identified current climate and energy challenges, such as cracked runways, sunken foundations, and multiple power outages. However, officials from five of these installations said they had not begun incorporating future climate risks into their installations' planning. They stated that their day-to-day focus was on reacting to immediate problems or reducing risk to existing hazards, rather than planning for future hazards.

[29] (U) U.S. Army Installation Management Command is responsible for the management of Army installations worldwide. U.S. Army Installation Management Command's master planning records for 2020 showed that of the 56 Army Installation Master Plans submitted in 2020, 50 did not contain a military installation resilience component, including the 2 Alaska installations that submitted plans, Fort Wainwright and Fort Greely.

~~(CUI)~~ [redacted] He said that he had identified short-term repairs for the generators in the two plants to keep them running until they could be replaced. [redacted]

(U) Figure 8. Damaged Embankment Armoring to Prevent Flooding of the North River, Thule AB, Greenland
(U) Source: The DoD OIG.

(U) Thule AB leaders identified current climate-related risks to the base infrastructure. The base maintenance contractors stated that the North River, fed by a higher rate of glacial melt, was eroding its banks and increasing the likelihood of flooding. Base maintenance contractors repeatedly armor the banks of the North River with large boulders to prevent the river from flooding the installation. Figure 8 shows the erosion of the rock armoring placed on the banks of the North River to control flooding. Finally, leaders described and we observed extensive damage to the Thule AB runway shoulders and aircraft hangars from permafrost melt and the freezing and thawing of water that is collecting under the airfield infrastructure.

~~(CUI)~~ In another example, a Maintenance Squadron Production Superintendent assigned to Eielson AFB's F-35A fighter aircraft described the challenges from the soil freezing and thawing beneath the infrastructure on the base. [redacted]

~~(CUI)~~ During our fieldwork, we observed examples of the effects of freezing and thawing on the runway and on other [redacted]

(U) Figure 9. Undulations in the Road Near the Entrance to the Eielson AFB Ammunition Supply Point
(U) Source: The DoD OIG.

(U) Wildfires are another example of climate-related risks and challenges to installations in Alaska. The Army Climate Resilience Handbook states that wildfires are expected to burn more intensely and over larger areas, driven in part by increases in evaporation and more frequent drought. According to the U.S. Army Alaska (USARAK) G3/5/7 Operations Officer and Range Managers at Fort Wainwright, Alaska, wildfires are the main climate change issue for USARAK G3/5/7 range control personnel at Fort Wainwright. The USARAK operations officer stated that the DoD pays approximately $1.5 million per year

(U) for preventative fire suppression services on Fort Wainwright. However, he said that during the 2019 fire season, from April through July, the DoD paid an additional $5.5 million for wildfire response.

(U) Figure 10. Ammunition Bunker Wall Separation Due to Frost Heaving, Eielson AFB, Alaska
(U) Source: The DoD OIG.

(U) The USARAK Range Operations Manager further stated that wildfires cause a significant loss of training time. For example, Fort Wainwright G3/5/7 conducted a 2019 "fire season" after action review. The after action review showed that in July 2019, wildfires halted training for two Pacific Air Forces fighter squadrons at Fort Wainwright. As a result, the squadrons were unable to expend over $3.8 million of ammunition that was planned for the training. The Operations Manager stated that Pacific Air Forces rely heavily on USARAK ranges for aerial bombardment and other aerial-related training. However, the after action review showed that one of the squadrons was only able to execute 59 percent of its planned training in July 2019 due to wildfire range restrictions at Fort Wainwright.

(U) USARAK has implemented several measures to respond to wildfires. The Range Operations Manager stated that USARAK generates two range use reports daily, based on current weather reporting, to control training activities when wildfire risk is high. Additionally, according to the Range Operations Officer, after an extensive wildfire in the Fort Wainwright area in 2013, Fort Wainwright established a Fire Mitigation Community of Interest that includes Army, Air Force, Bureau of Land Management members, and community members from the Fort Wainwright area.

~~(CUI)~~ [redacted] Additionally, he identified damage to infrastructure on the installation, particularly to asphalt and concrete surfaces, caused by continuous freezing and thawing of sub-surface water.

(U) Figure 11. (left) Fort Greely Quarry, Flooded
(U) Figure 12. (right) Fort Greely Quarry, Normal
(U) Source: Fort Greely DPW.

(U) Risks and challenges caused by water-related incidents also directly impact installations' infrastructure. The DPW Chief at Fort Greely, Alaska, stated that Fort Greely has historically experienced spring thaw flooding of a creek that is adjacent to the installation and continues to face annual flood risks. Figure 11 shows the extent of flooding in a Fort Greely quarry in May 2020. The DPW Chief stated that the flooding covered more than 5 acres and in some places was deeper than 20 feet. Flooding has also been responsible for the erosion of portions of several roads on Fort Greely. We observed a successful airfield drainage project that the DPW Chief implemented as a flood mitigation measure, and he discussed several additional flood control and repair plans and recommendations for Fort Greely.

(U) Finally, storms present significant climate and energy risks and challenges for Arctic installations. The 611th CES Deputy Base Civil Engineer at JBER, responsible for the oversight of 20 radar sites throughout Alaska and the Pacific, stated that the 611th CES identified current and future risks to their radar site locations in accordance with the Air Force's Playbook. Figures 1 and 2, show storm damage from a 2021 storm at Eareckson Air Station, Alaska. In addition to the damage to Hangar 7, the pier sustained significant damage from a storm in February 2020, leaving it in critical condition and in need of repair. The pier is critical for the

(U) success of the air station's mission because any disruption in the supply of fuel to the installation would result in catastrophic mission failure. Short-term repairs of the pier scheduled for FY 2022 will cost approximately $6.4 million, with the repairs expected to last for 48 months. Subsequent long-term repairs of the pier will cost approximately $137 million and will require demolition to portions of the FY 2022 short-term repairs.

(U) The DoD and the Service Components Did Not Provide Guidance for Implementing Military Installation Resilience Assessments

(U) In March 2021, the Secretary of Defense directed the creation of the DoD Climate Working Group to coordinate DoD actions in response to Executive Order 14008.[30] To implement Climate Working Group policy directives, the DoD stood up the Climate Action Team in March 2021 within the Office of the DASD(E&ER). Additionally, the office of the DASD(E&ER), USACE, and AFCEC developed tools and handbooks for measuring and assessing an installation's climate resilience. However, the DoD and Service Components did not provide implementation guidance, including implementation timelines and climate assessment tool training, to coordinate climate resilience assessment and planning at the installation level.

(U) In June 2021, a spokesperson for the DASD(E&ER) told us that the DoD Climate Action Team was planning the DCAT implementation and was developing DCAT training through the end of 2021 and into 2022. However, she stated that the DASD(E&ER) had not established a timeline for installations to begin climate assessments with the DCAT or the ACAT.[31] Also, in May 2021, an official from the office of the Assistant Secretary of the Army for Installations, Energy and Environment stated that the Army Climate Change Working Group priority was planning to publish its overall Army climate strategy by the end of July 2021.

(U) In followup correspondence in August 2021, this same official reported that the Army Climate Change Working Group had extended the completion date for the Army climate strategy from the end of July 2021 to fall 2021. She also stated that the Army had not issued any policies or directives related to climate change since the publication of Army Directive 2020-08.[32] Army Directive 2020-08 directed the Deputy Chief of Staff, G-9 to release implementation guidance within 90 days

[30] (U) The White House, Executive Order 14008, "Executive Order on Tackling the Climate Crisis at Home and Abroad," January 27, 2021.

[31] (U) On September 30, 2021, the DoD announced the "Department of Defense Climate Adaptation Plan," dated September 1, 2021, with the Acting Assistant Secretary of Defense for Sustainment responsible for its implementation.

[32] (U) Army Directive 2020-08, "U.S. Army Installation Policy To Address Threats Caused By Changing Climate And Extreme Weather," September 11, 2020. Army Directive 2020-08 directed commanders of Army installations to assess, plan for, and adapt to the projected impacts of changing climate and extreme weather by adding the results of climate change prediction analysis tools into all facility and infrastructure-related plans, policies, and procedures.

(U) of the date of the directive. Based on the September 11, 2020 publication date of Army Directive 2020-08, the Deputy Chief of Staff, G-9, should have issued this implementation guidance by December 10, 2020.

(U) The Office of the SAF/IE stated in June 2021 that the Air Force was waiting for its incoming Secretary to arrive before deciding on its climate assessment guidance to the field. Previously, on March 15, 2021, the Air Force published its climate assessment guidance to sub-Arctic and Arctic installations, issuing a memorandum directing installations to complete an assessment of current and future climate hazards as part of the Air Force Playbook climate assessment process.[33] The memorandum stated that the DAF would address Phase 3 of the Air Force Playbook as part of a future requirement to develop an Installation Climate Resiliency Plan. However, the DAF had not addressed completion of the Phase 3 requirement as of October 2021.

(U) Installation Leaders Lacked Resources to Analyze and Assess Climate Change

(U) Installation leaders lacked the resources to analyze and assess climate change risks and challenges. Officials at the six installations we visited stated that their personnel had not received climate assessment training. Additionally, officials at five of six installations identified a lack of funding for current installation sustainment priorities. Moreover, because the DAF defines Clear Space Force Station and Thule AB as Geographically Separated Units, those installations do not house full CESs. Installation officials stated that if they did not receive a climate-related military construction project, which comes with funding, the installation would be required to use sustainment, restoration, and modernization funds for climate-related projects. However, officials at five of six installations stated that funds for current sustainment, restoration, and modernization priorities were insufficient. A CES commander's budget figures from one of the installations we visited showed that from 2018 to 2021 the DAF validated his installation's maintenance fund requests but allocated significantly less. For example, in FY 2021, he requested $72.2 million for facility maintenance funds; however, while the DAF validated $68.1 million, it only allocated $35.4 million to the installation. At a Space Force installation, a civil engineer provided a list of 126 unfunded maintenance projects that the base maintenance contract did not cover.

[33] (U) HQ USAF/A4C, "Usage of AF Civil Engineer Severe Weather/Climate Hazard Screening And Risk Assessment Playbook For Real Property Above 60° Latitude In Support of the DAF Arctic Strategy," March 15, 2021.

(U) Figure 13. Power Plant Generator, Thule AB, Greenland
(U) Source: The DoD OIG.

(U) No installation personnel we interviewed at any of the installations we evaluated had received training to use the DCAT or ACAT. Although the Office of the DASD(E&ER) and USACE developed these tools to provide an initial assessment of an installation's climate exposure, installation leaders stated that their personnel lacked climate assessment training to use the DCAT or the ACAT. An Army installation DPW Chief stated that although his department had an adequate number of experienced personnel, he did not believe his staff was qualified to make long-term climate or environmental projections. Additionally, a SAF/IE spokesperson stated that there is no formal training for using the Air Force Playbook. SAF/IE documents showed that DAF personnel provided an overview of the Air Force Playbook on several occasions during 2021; however, the training attendance rosters did not demonstrate that installation leaders received or participated in the overviews.

(U) Installation leaders discussed challenges with the installation master planning process. Two officials stated that they viewed Installation Master Plans and IDPs as "wish lists" that did not always reflect the installation's current priorities. An installation master planner stated that master plan projects often face strong

(U) competition from other funding priorities within the Service Component. A CES commander stated that an architecture/engineering firm typically contracts to develop his installation master plans, building the plans based on input from his staff and other stakeholders on the installation. He stated that master plans are very expensive to produce and can quickly become outdated as installation priorities change.

(U) The SAF/IE stated that AFCEC is developing a digital comprehensive planning platform for Air Force installation planning that installations can update as installation priorities and plans change. An AFCEC spokesperson for the platform project stated that IDPs would be included in the new platform, providing live updates of plans and reducing the costs of contracted, hard-copy plans.

~~(CUI)~~ [redacted]

~~(CUI)~~ [redacted] The installations in the Arctic and sub-Arctic support the DoD Arctic strategies by providing regional stability, strengthening rules-based order, and enhancing Arctic operations, among others. [redacted]. Installations are neither assessing nor planning to reduce risk of future occurrences through climate resiliency. [redacted]

(U) Recommendations

(U) Recommendation 1

(U) We recommend that the Assistant Secretary of Defense for Energy, Installations, and Environment incorporate section 2864, title 10, United States Code, master planning requirements for major military installations into its Department of Defense climate change adaptation and resilience policy.

(U) ASD(EI&E) Comments

(U) The Senior Executive performing the duties of the ASD(EI&E) concurred with the recommendation and stated that his office will incorporate section 2864, title 10, United States Code, into the DoD's climate change adaptation and resilience policy.

(U) Our Response

(U) On October 7, 2021, the White House released the "DoD Climate Adaptation Plan," September 1, 2021. The plan's Line of Effort 3, "Resilient Built and Natural Installation Infrastructure," discusses the DoD's intent to "achieve resilient built and natural infrastructure through engaging all DoD installations in a comprehensive installation assessment and resilience planning activity incorporating outcomes into installation resilience plans." The DoD Climate Adaptation Plan addressed our recommendation to the ASD(EI&E) to incorporate master planning requirements for military installations into DoD climate change adaptation and resilience policy. Therefore, this recommendation is closed.

(U) Recommendation 2

(U) We recommend that the Assistant Secretary of the Army for Installations, Energy and Environment:

a. (U) Establish priorities, develop milestones, and identify planning and training resources for the Department of the Army.

(U) ASA(IE&E) Comments

(U) The ASA(IE&E) concurred with the recommendation and stated that the Army agrees with the necessity of establishing priorities, developing milestones, and identifying planning and training resources to address climate resilience. He cited the Army's published and in-progress plans and guidance that support climate resilience implementation, including the Army Climate Strategy published February 8, 2022. He stated that the Army is beginning work on its Climate Strategy Implementation Plan, which will identify detailed priorities, milestones, and resources to implement the Army Climate Strategy.

(U) Our Response

(U) The Army Climate Strategy dated February 8, 2022, states that Army installations will precisely identify and correctly prioritize its operations, activities, and investments in light of expanding climate change threats. The Army Climate Strategy states that the Army is already considering climate resilience in master planning, natural resource planning, range management, and installation energy and water planning, and is implementing advanced planning tools, beginning

(U) with the ACAT. The ASA(IE&E) stated that the Climate Strategy Implementation Plan would identify the priorities, milestones, and resources to implement its climate strategy. The ASA(IE&E) addressed the specifics of the recommendation; therefore, the recommendation is resolved but will remain open. We will close the recommendation when the Army publishes its Climate Strategy Implementation Plan identifying the priorities, milestones, and resources to implement its climate strategy.

b. (U) Establish Department of the Army installation orders requiring installation commanders to identify climate risks, conduct assessments, determine climate vulnerabilities, and identify and plan for follow-on climate resilience measures for current and future climate changes in installation master plans, in accordance with Department of Defense Instruction 4715.21; Army Directive 2020-08; and section 2864, title 10, United States Code.

(U) ASA(IE&E) Comments

(U) The ASA(IE&E) concurred with the recommendation and stated that the Army agrees with the necessity of installation commanders assessing climate risk and developing appropriate mitigation measures. He said the Army would publish an Installation Climate Resilience Planning Directive that will identify and prioritize infrastructure and real property actions required to sustain installation operations under emerging climate conditions. According to the ASA(IE&E), the directive will require the Army Components to use Installation Climate Resilience Planning to update Installation Master Plans no later than FY 2023.

(U) Our Response

(U) The ASA(IE&E) comments addressed the specifics of the recommendation; therefore, the recommendation is resolved but will remain open. We will close the recommendation when the Army publishes its Installation Climate Planning Directive that identifies and prioritizes actions required to sustain installation operations under emerging climate conditions, including the requirement for installations to conduct assessments, determine climate vulnerabilities, and identify and plan for follow-on climate resilience measures for current and future climate changes in installation master plans.

(U) Recommendation 3

(U) We recommend that the Assistant Secretary of the Air Force for Energy, Installations, and Environment:

a. (U) Establish priorities, develop milestones, and identify planning and training resources for the Department of the Air Force.

(U) SAF/IE Comments

(U) The SAF/IE concurred with the recommendation. The SAF/IE stated that he will provide guidance, direction, and oversight and will work closely with the DAF Deputy Chief of Staff for Logistics, Engineering and Force Protection, Director of Civil Engineers, and the Space Force Chief Operations Officer to develop priorities and milestones for completion of Installation Climate Resilience Plans for major DAF installations. The SAF/IE stated that the FY 2022 NDAA requires each Service to complete two Installation Climate Resilience Plans no later than the end of calendar year 2022 and stated that the DAF will meet that deadline. He stated he anticipates completion of Installation Climate Resilience Plans for all major DAF installations within 36 months.

(U) Our Response

(U) The SAF/IE addressed the specifics of the recommendation; therefore, the recommendation is resolved but will remain open. We will close the recommendation when the SAF/IE, in coordination with the DAF Deputy Chief of Staff for Logistics, Engineering and Force Protection, Director of Civil Engineers, and the Space Force Chief Operations Officer, publishes the DAF priorities and milestones for completion of the Installation Climate Resilience Plans for the major DAF installations.

b. (U) Establish Department of the Air Force installation orders requiring installation commanders to identify climate risks, conduct assessments, determine climate vulnerabilities, and identify and plan for follow-on climate resilience measures for current and future climate changes in installation master plans, in accordance with Department of Defense Instruction 4715.21; Air Force Instruction 32-1015; and section 2864, title 10, United States Code.

(U) SAF/IE Comments

(U) The SAF/IE partially concurred with the recommendation. The SAF/IE stated that he would work closely with the appropriate DAF offices to develop priorities and milestones for completion of Installation Climate Resilience Plans based on

(U) DoD Directive 4715.21, Air Force Instruction 32-101, and UFC 2-100-01.[34] However, the SAF/IE stated that base commanders work for the Major Commands and Field Commands and are not in a command relationship with SAF/IE, and therefore the SAF/IE lacks the authority to issue compulsory orders. Additionally, the SAF/IE stated that, per Air Force Mission Directive, all Air Force Major Commands report to the Chief of Staff of the Air Force, and, per the Fiscal Year 2020 National Defense Authorization Act, all Space Force Field Commands report to the Chief of Space Operations.

(U) Our Response

(U) The SAF/IE stated that he would continue to work with DAF offices to prioritize and implement the installation climate resilience policies of the DAF. However, he stated that the DAF Major Commands and Field Commands must issue the orders to DAF installations to address climate resilience in installation master plans and comply with DoD and Air Force regulations and public law. Air Force Mission Directive 1, paragraph 2, states that the Secretary of the Air Force is the head of the DAF, and is responsible for, and has the authority necessary to conduct all affairs of the DAF.

(U) Comments from the SAF/IE addressed the specifics of the recommendation. We request that the SAF/IE, as a member of the DAF Secretariat, oversee the Major Command and Field Command issuance of orders to address the priorities and milestones for climate resilience in installation master plans. We followed up with SAF/IE officials after receiving their management comments on this recommendation, and they agreed to provide the requested oversight. We will close this recommendation once the SAF/IE provides a DAF directive, orders, or other documentation to identify climate risks, conduct assessments, and determine climate vulnerabilities from the Major Commands and Field Commands within 36 months.

[34] (U) UFC 2-100-01, September 30, 2020, addresses the military installation resilience requirements from section 2864, title 10, United States Code.

(U) Appendix

(U) Scope and Methodology

(U) We conducted this evaluation from May 2021 through January 2022 in accordance with the "Quality Standards for Inspection and Evaluation," published in January 2012 by the Council of Inspectors General on Integrity and Efficiency. Those standards require that we adequately plan the evaluation to ensure that objectives are met and that we perform the evaluation to obtain sufficient, competent, and relevant evidence to support the findings, conclusions, and recommendations. We believe that the evidence obtained was sufficient, competent, and relevant to lead a reasonable person to sustain the findings, conclusions, and recommendations.

~~(CUI)~~ The scope of this project focused on the DoD's efforts to address the climate resilience of U.S. military installations in the Arctic and sub-Arctic. The scope included the master plans of five installations in sub-Arctic Alaska: JBER, Clear Space Force Station, Eielson AFB, Fort Wainwright, and Fort Greely; and one U.S. military installation in the Arctic: Thule AB, Greenland. We also reviewed the Installation Design Guide from 611th CES. [redacted]

(U) The team traveled to the six military installations listed above and observed climate hazards and installation climate resilience activities at each installation. We also reviewed applicable laws, regulations, and policies pertaining to the DoD, Army, Air Force, and Space Force and reviewed the climate resilience portions of master plans, including installation, geographically separated units, and remote sites. We determined the climate resilience policies and processes specific to the Service Components from reviewing Component and installation requirements and their implementation by the Army and Air Force headquarters and by U.S. military installations. Finally, we reviewed the military installation resilience requirements with DoD, Army, and Air Force climate subject matter experts, installation planners, and other key stakeholders to gain an understanding of master planning and climate resilience processes and challenges.

(U) This report was reviewed by the DoD Components associated with this oversight project to identify whether any of their reported information, including legacy FOUO information, should be safeguarded and marked in accordance with the DoD CUI Program. In preparing and marking this report, we considered any

(U) comments submitted by the DoD Components about the CUI treatment of their information. If the DoD Components failed to provide any or sufficient comments about the CUI treatment of their information, we marked the report based on our assessment of the available information.

(U) Use of Computer-Processed Data

(U) We did not use computer-processed data to perform this evaluation.

(U) Laws and Regulations

- (U) 10 U.S.C § 2864 (2020), "Master plans for major military installations"
- (U) 10 U.S.C § 2815 (2020), "Military installation resilience projects"

(U) DoD Directives and Instructions

- (U) DoD Directive 4715.21, "Climate Change Adaptation and Resilience," (Incorporating Change 1), August 31, 2018
- (U) DoD Instruction 4165.70, "Real Property Management," (Incorporating Change 1), August 31, 2018
- (U) DoD Instruction 4170.11, "Installation Energy Management," (Incorporating Change 2), August 31, 2018
- (U) Unified Facilities Criteria 2-100-01, "Installation Master Planning," September 30, 2020

(U) Service Component Standards and Regulations

- (U) Army Directive 2020-08, "U.S. Army Installation Policy to Address Threats Caused by Changing Climate and Extreme Weather," September 11, 2020
- (U) Air Force Instruction 32-1015, "Integrated Installation Planning," Corrective Action, January 4, 2021

(U) Evidence and Documentation Reviewed

(U) To evaluate the DoD's efforts to address the climate resilience of U.S. military installations in the Arctic and sub-Arctic, we reviewed congressional, DoD, Army, Air Force, and Space Force documentation and plans related to installation planning. We analyzed the DoD, Army, and Air Force Arctic Strategies. We reviewed the Air Force Playbook and the Army Climate Resilience Handbook. We attended the DoD Climate Change Working Group and interviewed the chair of the group. We interviewed officials who provide oversight on the use of the DCAT as well as receive weekly usage reports on the use of the DCAT and the ACAT.

(U) For this evaluation, we completed the following activities:

- (U) interviewed installation leadership and civil engineering personnel both in Alaska and Greenland;
- (U) observed and assessed on-site climate effects and energy shortfalls at each of the six installations we visited;
- (U) reviewed installation construction project plans designed to reduce risk from current climate and energy hazards to installation infrastructure, assets, and missions;
- (U) collected after action reviews and reports pertaining to climate impact on installation operations and training;
- (U) reviewed past and current DoD and Service climate and energy guidance; and
- (U) reviewed congressional testimonies on DoD and Service efforts to improve military installation resilience.

(U) Interviews

(U) We interviewed DoD, Army, Air Force, and Space Force officials via teleconference and in person on addressing climate and energy resilience in master plans. Specifically, we interviewed officials from:

- (U) Deputy Assistant Secretary of Defense (Environment and Energy Resilience)
- (U) Assistant Secretary of the Air Force for Energy, Installations, and Environment
- (U) Assistant Secretary of the Army for Installations, Energy and Environment
- (U) Army Deputy Chief of Staff, G9 (Installations)
- (U) Space and Missile Defense Command
- (U) Department of Defense Climate Working Group
- (U) U.S. Army Installation Management Command
- (U) Air Force Civil Engineer Center
- (U) Joint Base Elmendorf-Richardson, Alaska
- (U) U.S. Alaskan Command
- (U) U.S. Army Alaska's Training Support Activity
- (U) Eielson Air Force Base, Alaska
- (U) Fort Wainwright, Alaska
- (U) Fort Greely, Alaska

- (U) Clear Space Force Station, Alaska
- (U) Peterson Space Force Base, Colorado
- (U) Thule Air Base, Greenland
- (U) 12th Space Warning Squadron
- (U) 23rd Space Operations Squadron
- (U) 611th Civil Engineer Squadron
- (U) Denali Commission
- (U) U.S. Army Corps of Engineers Alaska District
- (U) U.S. Army Corps of Engineers Cold Regions Research and Engineering Laboratory
- (U) U.S. Army Corps of Engineers New York District

(U) Prior Coverage

(U) No prior coverage has been conducted by the DoD OIG on U.S. military installation climate resilience during the last 5 years.

(U) During the last 5 years, the Government Accountability Office (GAO) issued four reports discussing U.S. military installations and climate resilience. Unrestricted GAO reports can be accessed at http://www.gao.gov.

(U) GAO

(U) Report No. GAO-21-46 "DoD Coordinates with Communities, but Needs to Assess the Performance of Related Grant Programs," December 2020

(U) The GAO reviewed the DoD's efforts to coordinate with communities surrounding its installations to limit the exposure of installations to climate change and extreme weather. This report assessed the extent to which the DoD (1) reports using the physical infrastructure and support services of communities surrounding its domestic installations, along with vulnerabilities to such infrastructure and services resulting from climate change and extreme weather, and (2) coordinates with communities surrounding its domestic installations to limit installation exposure to the effects of climate change and extreme weather, and is able to determine the effectiveness of related community coordination grants.

(U) Report No. GAO-20-511, "Actions Needed to Ensure DoD Considers Climate Risks to Contractors as Part of Acquisition, Supply, and Risk Assessment," June 2020

(U) The GAO reviewed potential threats to national security resulting from the effects of climate change on defense contractors and the defense supply chain. This report examined the extent to which the DoD assesses the potential effects on its operations from climate change and extreme weather risks faced by its contractors through the Department's (1) acquisition and supply processes, and (2) mission assurance process. DoD guidance on the defense acquisition system provides principles, policies, and procedures for the acquisition of products, services, and technologies necessary to support U.S. armed forces, and its guidance on the management of the department's supply chain notes that it is DoD policy to identify, monitor, and assess potential disruptions within and outside of the supply chain.

(U) Report No. GAO-20-127, "Climate Resilience: A Strategic Investment Approach for High-Priority Projects Could Help Target Federal Resources," October 2019

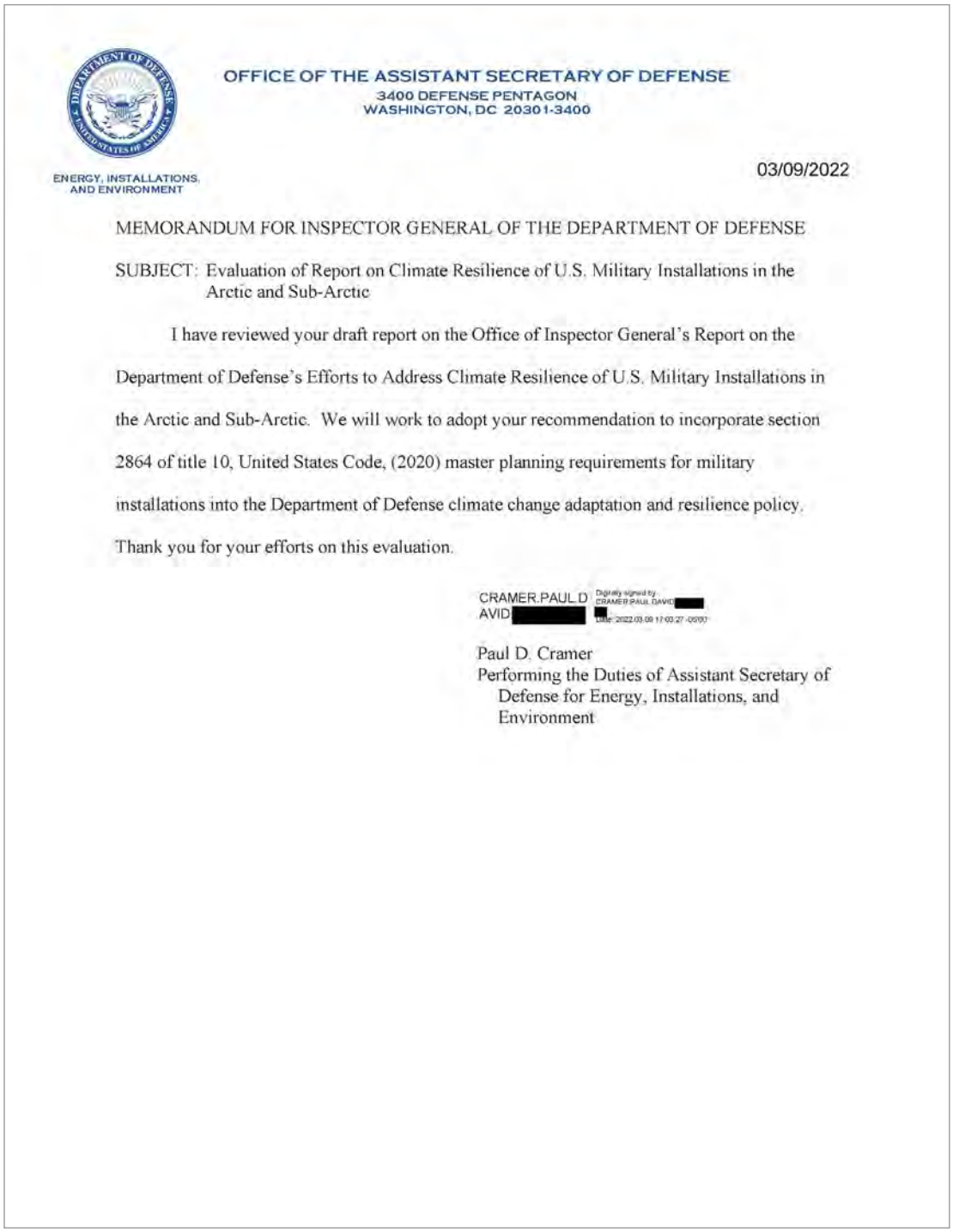
(U) The GAO's analysis found that the Federal government did not strategically identify and prioritize projects to ensure they address the nation's most significant climate risks. The report stated that no Federal agency, interagency collaborative effort, or other organizational arrangement has been established to implement a strategic approach to climate resilience investment that includes periodically identifying and prioritizing projects. The GAO stated that such an approach could supplement individual agency climate resilience efforts and help target Federal resources toward high-priority projects.

(U) Report No. GAO-19-453, "DoD Needs to Assess Risk and Provide Guidance on Use of Climate Projections in Installation Master Plans and Facilities Designs," June 2019

(U) The GAO's analysis of the DoD's assessment of current and projected risks from the effects of extreme weather and climate change found that DoD installations had not consistently assessed risks from extreme weather and climate change effects or consistently used projections to anticipate future climate conditions. The GAO also found that, because they lacked guidance on how to incorporate projections into their master plans, most of the installations had not used climate projections in their plans.

(U) Management Comments

(U) Assistant Secretary of Defense for Energy, Installations, and Environment



OFFICE OF THE ASSISTANT SECRETARY OF DEFENSE
3400 DEFENSE PENTAGON
WASHINGTON, DC 20301-3400

ENERGY, INSTALLATIONS, AND ENVIRONMENT

03/09/2022

MEMORANDUM FOR INSPECTOR GENERAL OF THE DEPARTMENT OF DEFENSE

SUBJECT: Evaluation of Report on Climate Resilience of U.S. Military Installations in the Arctic and Sub-Arctic

I have reviewed your draft report on the Office of Inspector General's Report on the Department of Defense's Efforts to Address Climate Resilience of U.S. Military Installations in the Arctic and Sub-Arctic. We will work to adopt your recommendation to incorporate section 2864 of title 10, United States Code, (2020) master planning requirements for military installations into the Department of Defense climate change adaptation and resilience policy.

Thank you for your efforts on this evaluation.

CRAMER.PAUL.D AVID [redacted] Digitally signed by CRAMER.PAUL.DAVID [redacted] Date: 2022.03.09 17:03:27 -05'00'

Paul D. Cramer
Performing the Duties of Assistant Secretary of Defense for Energy, Installations, and Environment

(U) Assistant Secretary of the Army for Installations, Energy and Environment

DEPARTMENT OF THE ARMY
OFFICE OF THE ASSISTANT SECRETARY OF THE ARMY
INSTALLATIONS, ENERGY AND ENVIRONMENT
110 ARMY PENTAGON
WASHINGTON DC 20310-0110

FEB 2 8 2022

SAIE

MEMORANDUM FOR U.S. Department of Defense Office of Inspector General, 4800 Mark Center Drive, Alexandria, VA 22350-1500

SUBJECT: U.S. Army Response to the DoD, OIG's Draft Report on Climate Resilience

1. Reference Department of Defense Office of Inspector General's Draft Report, "Evaluation of the Department of Defense's Efforts to Address the Climate Resilience of U.S. Military Installations in the Arctic and Sub-Arctic" (Project No. D2021-DEV0PC-0106.000), dated 7 February 2022.

2. The Army has reviewed the draft report, concurs with the recommendations and has already taken substantive steps to address the recommendations.

3. The Army found that the full scope of its efforts to improve climate resilience were not credited in the draft report's findings. Detailed comments on the draft report's recommendations are enclosed.

4. Point of contact is [redacted]

Encl

PAUL W. FARNAN
Acting Assistant Secretary of the Army
(Installations, Energy and Environment)

(U) Assistant Secretary of the Army for Installations, Energy and Environment (cont'd)

DoD OIG Draft Report Dated 7 February 2022
Project No. D2021-DEV0PC-0106.000

"Evaluation of the Department of Defense's Efforts to Address the Climate Resilience of U.S. Military Installations in the Arctic and Sub-Arctic"

Army Response to DoD OIG Recommendations

We appreciate the opportunity to respond to the recommendations in the DoD Office of Inspector General's draft report of the "Evaluation of the Department of Defense's Efforts to Address the Climate Resilience of U.S. Military Installations in the Arctic and Sub-Arctic." In the Recommendations 2a and 2b, the DoD OIG suggests areas where the Army can accelerate its climate change efforts. The Army notes important additional information and context regarding these recommendations below. The Army is committed to building climate resilience across its installations and operations and will continue its close collaborations with the Department of Defense to ensure mission readiness in the face of climate threats.

DoD OIG RECOMMENDATION 2: We recommend that the Assistant Secretary of the Army for Installations, Energy and Environment:

a. Establish priorities, develop milestones, and identify planning and training resources for the Department of the Army.

ARMY RESPONSE: Concur. The Army agrees with the necessity of establishing priorities, developing milestones, and identifying planning and training resources to address climate resilience. The Army's published and in-progress plans and guidance that support climate resilience implementation include:

- Army Climate Strategy, 8 February 2022
- Army Climate Strategy Implementation Plan, publication is expected in 2022
  - The Army is beginning work on an implementation plan for the Army Climate Strategy which identifies more detailed priorities, milestones, and resources.
- Army Installations Strategy, December 2020
  - This document includes guidance to strengthen operational and climate change resilience at installations.
- Army Regulation 410-1 (Army Facilities Management), 12 February 2008
  - This regulation is being updated to include language on completion of assessments of climate resilience and of adaptation of projects as identified by climate vulnerabilities.
- Army Regulation 210-20 (Real Property Master Planning for Army Installations), 3 October 2021, pending publication
  - This regulation has been drafted to include climate resilience guidance.

(U) Assistant Secretary of the Army for Installations, Energy and Environment (cont'd)

- Department of the Army Pamphlet 210-20 (Real Property Master Planning Components and Process), 3 October 2021, pending publication
  - This draft pamphlet sets forth a requirement for climate resilience planning to be conducted using the climate vulnerability assessment tools (Army Climate Assessment Tool or Department of Defense Climate Assessment Tool) and the Army Climate Resilience Handbook.
- Army Climate Resilience Handbook, August 2020
  - The handbook guides installations through the climate exposure assessment process.
- Army Climate Assessment Tool (ACAT) or the Department of Defense Climate Assessment Tool (DCAT)
  - These tools can be used by installations to complete climate exposure analyses.
- Army Regulation 200-1 (Environmental Protection and Enhancement), updated publication is expected in 2022
  - The document updates include requirements to incorporate climate change factors into Army environmental management.

b. Establish Department of the Army installation orders requiring installation commanders to identify climate risks, conduct assessments, determine climate vulnerabilities, and identify and plan for follow-on climate resilience measures for current and future climate changes in installation master plans, in accordance with Department of Defense Instruction 4715.21; Army Directive 2020-08; and section 2864, title 10, United States Code.

ARMY RESPONSE: Concur. The Army agrees with the necessity of installation commanders assessing climate risk and developing appropriate mitigation measures. Current guidance documents and tools that support climate resilience measures for the installation master planning process include:

- Army Climate Strategy, 8 February 2022
- Army Installations Strategy, December 2020
  - This document includes guidance to strengthen operational and climate change resilience at installations.
- Army Directive 2020-08 (U.S. Army Installation Policy to Address Threats Caused by Changing Climate and Extreme Weather), 11 September 2020
- Army Directive 2020-3 (Installation Energy and Water Resilience Policy), 31 March 2020
- Department of Army Guidance for Installation Energy and Water Plans (IEWP), 5 October 2021, pending publication
  - The IEWP guidance document is being drafted to include installation-specific information about the climate risk to energy and water resources.
- UFC 2-100-01 (Installation Master Planning), 1 February 2022
- The Army Climate Resilience Handbook, August 2020
  - The handbook guides installations through the climate exposure assessment process.
- Army Climate Assessment Tool (ACAT) or the Department of Defense Climate Assessment Tool (DCAT)

(U) Assistant Secretary of the Army for Installations, Energy and Environment (cont'd)

- These tools can be used by installations to complete climate exposure analyses.

- Army Directive 2022- XX (Installation Climate Resilience Planning), pending publication
  - The Installation Climate Resilience Planning (ICRP) identifies and prioritizes infrastructure and real property actions required to sustain installation operations under emerging climate conditions.
  - A memo with the new ICRP directive was released 1 February 2022.
  - HQAMC and HQIMCOM are conducting a pilot climate study at Fort Carson in March 2022 to assist in finalizing the procedure and format for the ICRP.
  - Official ICRP guidance will be released within 45 days of the ICRP memo.
  - All Army components will update Installation Master Plans with ICRP no later than Fiscal Year 2023.
  - The Unified Facility Criteria (UFC) 2-100-01, Installation Master Planning, was already updated in September 2020 to define and reflect the ICRP requirement.

(U) Assistant Secretary of the Air Force, Energy, Installations, and Environment

DEPARTMENT OF THE AIR FORCE
WASHINGTON, DC

OFFICE OF THE ASSISTANT SECRETARY

Mar 3, 2022

MEMORANDUM FOR DEPARTMENT OF DEFENSE INSPECTOR GENERAL

FROM: HQ USAF/IE
1665 Air Force Pentagon
Washington, DC 20330-1665

SUBJECT: Department of the Air Force Response to DoD Office of Inspector General Draft Report, "Evaluation of the Department of Defense's Efforts to Address the Climate Resilience of U.S. Military Installations in the Arctic and Sub-Arctic (Project No. D2021-DEVOPC-0106.000)"

1. This is the Department of the Air Force (DAF) response to the DoD OIG Draft Report "Evaluation of the Department of Defense's Efforts to Address the Climate Resilience of U.S. Military Installations in the Arctic and Sub-Arctic (Project No. D2021-DEVOPC-0106.000)." The Department does not agree with the report findings as written but outlines a path forward to address the recommendations.

2. The Assistant Secretary of the Air Force Energy, Installations, and Environment (SAF/IE), exercising its responsibilities for providing guidance, direction, and oversight, will work closely with the Deputy Chief of Staff for Logistics, Engineering and Force Protection, Director of Civil Engineers (AF/A4C), and the Space Force Chief Operations Officer (SF/COO), to address the following recommendations:

RECOMMENDATION: We recommend that the Office of the Assistant Secretary of the Air Force for Energy, Installations, and Environment:

RECOMMENDATION a: establish priorities, develop milestones, and identify planning and training resources for the Department of the Air Force; and

RECOMMENDATION b: establish Department of the Air Force installation orders requiring installation commanders to identify climate risks, conduct assessments, determine climate vulnerabilities, and identify and plan for climate resilience measures for current and future climate changes in installation master plans, in accordance with DoD Directive 4715.21, Air Force Instruction 32-1015, and 10 U.S.C. §2864 (2020).

DEPARTMENT OF THE AIR FORCE RESPONSE: Partially Concur. SAF/IE, exercising its responsibilities for providing guidance, direction, and oversight, will work closely with AF/A4C and SF/COO to: i) reiterate already established DAF policy outlined in DoD Directive 4715.21, *Climate*

(U) Assistant Secretary of the Air Force, Energy, Installations, and Environment (cont'd)

Change Adaptation and Resilience, AFI 32-1015, *Integrated Installation Planning*, and UFC 2-100-01, *Installation Master Planning*, and ii) develop priorities and milestones for completion of Installation Climate Resilience Plans (ICRPs) for major DAF installations. Base commanders work for the Major Commands (MAJCOMs) and Field Commands (FIELDCOM) and are not in a command relationship with SAF/IE; thus, SAF/IE lacks authority to issue compulsory orders. Air Force Mission Directive (AFMD) 1, paragraph 2, states that all Air Force MAJCOMs report to the Chief of Staff of the Air Force. The Fiscal Year (FY) 2020 National Defense Authorization Act (NDAA), §1701, states that all Space Force FIELDCOMs report to the Chief of Space Operations.

At the time of the evaluation, and even now, the DAF complies with the requirement for a "military installation resilience component" in the installation master plan for major military installations (10 U.S.C. §2864), referred to as an "Installation Climate Resilience Plan" in UFC 2-100-01. Per the FY 2022 NDAA, each Service is required to complete two ICRPs no later than the end of calendar year 2022. The DAF will meet that deadline and anticipates completion of ICRPs for all major DAF installations within 36 months.

The DAF continues to lean forward to address severe weather and climate hazards in our planning efforts to prepare our installations to support current and future missions. The DAF is proud of its efforts to complete the hazard screening and risk assessment phases of the DAF Civil Engineer Severe Weather/Climate Hazard Screening and Risk Assessment Playbook at over 90+ locations. These results form a solid foundation for future completion of ICRPs for major military installations. We recognize that the readiness and resiliency of our installations is a matter of strategic importance to our Nation and is necessary to meet the National Defense Strategy's call for a more lethal force. We are committed to continuing our efforts to increase our resilience.

The SAF/IE point of contact is [redacted]

OSHIBA.EDWIN .H[redacted] Digitally signed by OSHIBA.EDWIN.H[redacted] Date: 2022.03.03 [redacted]

EDWIN H. OSHIBA, SES, DAF
Acting Assistant Secretary of the Air Force
Energy, Installations & Environment (SAF/IE)

(U) Acronyms and Abbreviations

AB	Air Base
ACAT	Army Climate Assessment Tool
AFB	Air Force Base
AFCEC	Air Force Civil Engineer Center
ASA(IE&E)	Assistant Secretary of the Army for Installations, Energy and Environment
ASD(EI&E)	Assistant Secretary of Defense for Energy, Installations, and Environment
CES	Civil Engineer Squadron
DAF	Department of the Air Force
DASD(E&ER)	Deputy Assistant Secretary of Defense, Environment and Energy Resilience
DCAT	DoD Climate Assessment Tool
DPW	Department of Public Works
IDP	Installation Development Plan
JBER	Joint Base Elmendorf-Richardson
QDR	Quadrennial Defense Review
SAF/IE	Assistant Secretary of the Air Force, Energy, Installations, and Environment
UFC	Unified Facilities Criteria
USACE	U.S. Army Corps of Engineers
USARAK	U.S. Army Alaska


INSPECTOR GENERAL
DEPARTMENT OF DEFENSE
INTEGRITY
EFFICIENCY

Whistleblower Protection
U.S. Department of Defense

Whistleblower Protection safeguards DoD employees against retaliation for protected disclosures that expose possible fraud, waste, and abuse in Government programs. For more information, please visit the Whistleblower webpage at http://www.dodig.mil/Components/Administrative-Investigations/Whistleblower-Reprisal-Investigations/Whisteblower-Reprisal/ or contact the Whistleblower Protection Coordinator at Whistleblowerprotectioncoordinator@dodig.mil

For more information about DoD OIG reports or activities, please contact us:

Congressional Liaison
703.604.8324

Media Contact
public.affairs@dodig.mil; 703.604.8324

DoD OIG Mailing Lists
www.dodig.mil/Mailing-Lists/

Twitter
www.twitter.com/DoD_IG

DoD Hotline
www.dodig.mil/hotline

DEPARTMENT OF DEFENSE | OFFICE OF INSPECTOR GENERAL

4800 Mark Center Drive
Alexandria, Virginia 22350-1500
www.dodig.mil
DoD Hotline 1.800.424.9098