

DRAFT

Environmental Assessment

BLUE ORIGIN NEW GLENN CADENCE INCREASE AT SPACE LAUNCH COMPLEX 36

CAPE CANAVERAL SPACE FORCE STATION, FLORIDA

September 2026

**Federal Aviation Administration
Department of the Air Force
United States Coast Guard
National Aeronautics and Space Administration**

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**Federal Aviation
Administration**

Photo credit Blue Origin

Draft Environmental Assessment for Blue Origin New Glenn Cadence Increase at Space Launch Complex 36, Cape Canaveral Space Force Station, Florida

AGENCIES: Federal Aviation Administration (FAA), lead federal agency. **Cooperating Agencies:** Department of the Air Force (DAF), United States (U.S.) Space Force; National Aeronautics and Space Administration (NASA), Kennedy Space Center; and U.S. Coast Guard (USCG).

This Environmental Assessment (EA) was prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, as amended (42 U.S. Code §4321 et seq.); FAA NEPA Implementing Procedures (FAA Order 1050.1G, June 30, 2025); the Department of War's NEPA Implementing Procedures (April 2026) and the DAF Policy for Implementation of NEPA (March 2026); NASA's NEPA implementing procedures set forth in 14 Code of Federal Regulations (CFR) part 1216, subpart 1216.3 (March 2026); and the USCG Environmental Planning Policy (Commandant Instruction [COMDTINST] 5090.1 (series) [April 23, 2019]) and the Environmental Planning Implementing Procedures (February 2025). FAA is the lead agency for the preparation and coordination of the EA; the DAF, NASA, and the USCG are cooperating agencies.

DEPARTMENT OF TRANSPORTATION, FEDERAL AVIATION ADMINISTRATION: FAA is evaluating Blue Origin, LLC's (Blue Origin's) proposal to increase the annual number of New Glenn operations at Cape Canaveral Space Force Station, Space Launch Complex (SLC)-36. Blue Origin is requesting a modification of its current FAA vehicle operator license, VOL 24-133, to increase the maximum allowed annual launches of the New Glenn vehicle at SLC-36 from 12 to 50. Modifying a license is considered a major federal action. FAA's issuance of temporary airspace closures to ensure public safety during launches is also a major federal action. Successful completion of the environmental review process does not guarantee FAA would issue a license modification to Blue Origin (under 14 CFR part 450), renew Blue Origin's license, or approve related airspace closures. Blue Origin's license application must also meet FAA safety, risk, policy, payload, and financial responsibility requirements per 14 CFR Chapter III, parts 400–460.

PUBLIC REVIEW PROCESS: In accordance with the applicable requirements, FAA is initiating a public review and comment period for the Draft EA. The public comment period begins with the publication of the Draft EA. Comments are due on October 30, 2026. Comments should be submitted via Federal Non-rulemaking Docket Portal (Docket Number FAA-2026-9841).

CONTACT INFORMATION: Questions regarding the EA can be addressed to Environmental Program Operational Support Branch, ASA 140, Office of Commercial Space Transportation Federal Aviation Administration, 201 4th St. SE, Washington, DC 20003.

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Acronyms and Abbreviations

Acronym	Definition
§/§§	section/sections
ACHP	Advisory Council on Historic Preservation
AHA	Aircraft Hazard Area
APE	Area of Potential Effects
ASEL	A-weighted sound exposure level
BCA	Biological and Conference Assessment
BGEPA	Bald and Golden Eagle Protection Act
Blue Origin	Blue Origin, LLC
CCP	Comprehensive Conservation Plan
CCSFS	Cape Canaveral Space Force Station
CDNL	C-weighted day-night average sound level
CFR	Code of Federal Regulations
CH ₄	methane
CMP	Coastal Management Program
CO ₂	carbon dioxide
CO ₂ e	carbon dioxide equivalent
COMDTINST	Commandant Instruction
CZMA	Coastal Zone Management Act
DAF	Department of the Air Force
dB	decibel(s)
dba	A-weighted decibels
DNL	day-night average sound level
DoD	Department of Defense
DOT	Department of Transportation
DoW	Department of War
EO	Executive Order
EA	Environmental Assessment
EFH	essential fish habitat
EIS	Environmental Impact Statement
ERD	Environmental Resources Document
ERP	Environmental Resource Permit
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FDEP	Florida Department of Environmental Protection
FONSI	Finding of No Significant Impact
HAPC	habitat areas of particular concern
ILV	integrated launch vehicle
INRMP	Integrated Natural Resources Management Plan
IPaC	Information for Planning and Consultation
KSC	Kennedy Space Center
LAA	Limited Access Area
L _{A,max}	maximum A-weighted sound level
lbf	million pounds-force
LC	Launch Complex
LH ₂	liquid hydrogen
L _{max}	maximum sound level
LNG	liquefied natural gas
LOX	liquid oxygen

Acronym	Definition
MBTA	Migratory Bird Treaty Act
MG	million gallons
MGD	million gallons per day
MINWR	Merritt Island National Wildlife Refuge
MMPA	Marine Mammal Protection Act
MSA	Magnuson-Stevens Fishery Conservation and Management Act
MT/yr	metric tons per year
N ₂ O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NAS	National Airspace System
NASA	National Aeronautics and Space Administration
NEI	National Emissions Inventory
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
No.	Number
NOTAM	Notice to Airmen
NOTMAR	Notice to Mariners
NO _x	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
OSHA	Occupational Safety and Health Administration
PDC	project design criteria
PLOC	Programmatic Letter of Concurrence
PM	particulate matter
PM ₁₀	particulate matter with a diameter equal to or less than 10 microns
PM _{2.5}	particulate matter with a diameter equal to or less than 2.5 microns
PSD	Prevention of Significant Deterioration
psf	pound per square foot
RNA	Regulated Navigation Area
SCCC	Spaceport Command and Control Center
SHPO	State Historic Preservation Officer
SJRWMD	St. Johns River Water Management District
SLC	Space Launch Complex
SLD 45	Space Launch Delta 45
SpaceX	Space Exploration Technologies Corp.
U.S.	United States
U.S.C.	United States Code
USCG	United States Coast Guard
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USSF	United States Space Force
VOL	vehicle operator license

Chapter 1. Introduction

The Federal Aviation Administration (FAA) is evaluating Blue Origin, LLC's (Blue Origin's) proposal to increase the annual number of New Glenn launch operations at Cape Canaveral Space Force Station (CCSFS) Space Launch Complex (SLC)-36 shown in Figure 1.1-1. Blue Origin is requesting a modification of its current FAA vehicle operator license, VOL 24-133, to increase the maximum allowable annual launches of the New Glenn vehicle from Blue Origin's existing launch pad at SLC-36 from 12 to 50. FAA has prepared this Environmental Assessment (EA) to evaluate the potential environmental effects of up to 50 launches per year at SLC-36. A maximum annual operational launch cadence of up to 50 launches per year is an increase of 38 annually compared to the up to 12 previously analyzed (DAF, 2016). This EA also evaluates the potential environmental effects associated with FAA's approval of related airspace closures.

This EA was prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, as amended (42 United States [U.S.] Code [U.S.C.] §4321 et seq.); FAA NEPA Implementing Procedures (FAA Order 1050.1G, June 30, 2025); the Department of War's (DoW's) NEPA Implementing Procedures (April 2026); the Department of the Air Force (DAF) Policy for Implementation of NEPA (March 2026); National Aeronautics and Space Administration's (NASA's) NEPA implementing procedures set forth in 14 Code of Federal Regulations (CFR) part 1216, subpart 1216.3 (March 2026); and the U.S. Coast Guard [USCG] Environmental Planning Policy (Commandant Instruction [COMDTINST] 5090.1 (series) [April 23, 2019]) and the Environmental Planning Implementing Procedures¹ (February 2025). FAA is the lead agency for the preparation and coordination of the EA; the DAF, NASA, and the USCG are cooperating agencies.

1.1 Background

The New Glenn program at CCSFS was first analyzed by the DAF as an "orbital launch vehicle" (later named "New Glenn") in the 2016 *Environmental Assessment, Blue Origin Orbital Launch Site at Cape Canaveral Air Force Station Florida*, hereafter referred to as "the 2016 DAF EA" (DAF, 2016), to which FAA was a cooperating agency. The 2016 DAF EA evaluated construction and operation of an orbital launch site at SLC-11 and SLC-36, including major elements such as a launch pad, integration facility, engine test stand, and systems to support recovery and refurbishment of a reusable first stage. The 2016 DAF EA also evaluated engine testing as part of the overall program and a proposed launch rate of up to 12 launches per year, with the first stage returning to an at-sea platform in the Atlantic Ocean and then transported to Port Canaveral for refurbishment and reuse. The DAF signed a Finding of No Significant Impact (FONSI) for the proposed action on December 8, 2016. FAA acted as a cooperating agency in the preparation of the 2016 DAF EA and issued a FONSI based on the 2016 DAF EA on April 13, 2017.

¹ The USCG Environmental Planning Policy (COMDTINST 5090.1 (series)) mandates use of the Environmental Planning Implementing Procedures. The two documents align with the U.S. Department of Homeland Security NEPA policy, Department of Homeland Security Instruction Manual 023-01-001-01 (series), and replace the USCG NEPA Implementing Procedures and Policy for Considering Environmental Impacts, COMDTINST 16475.1D.

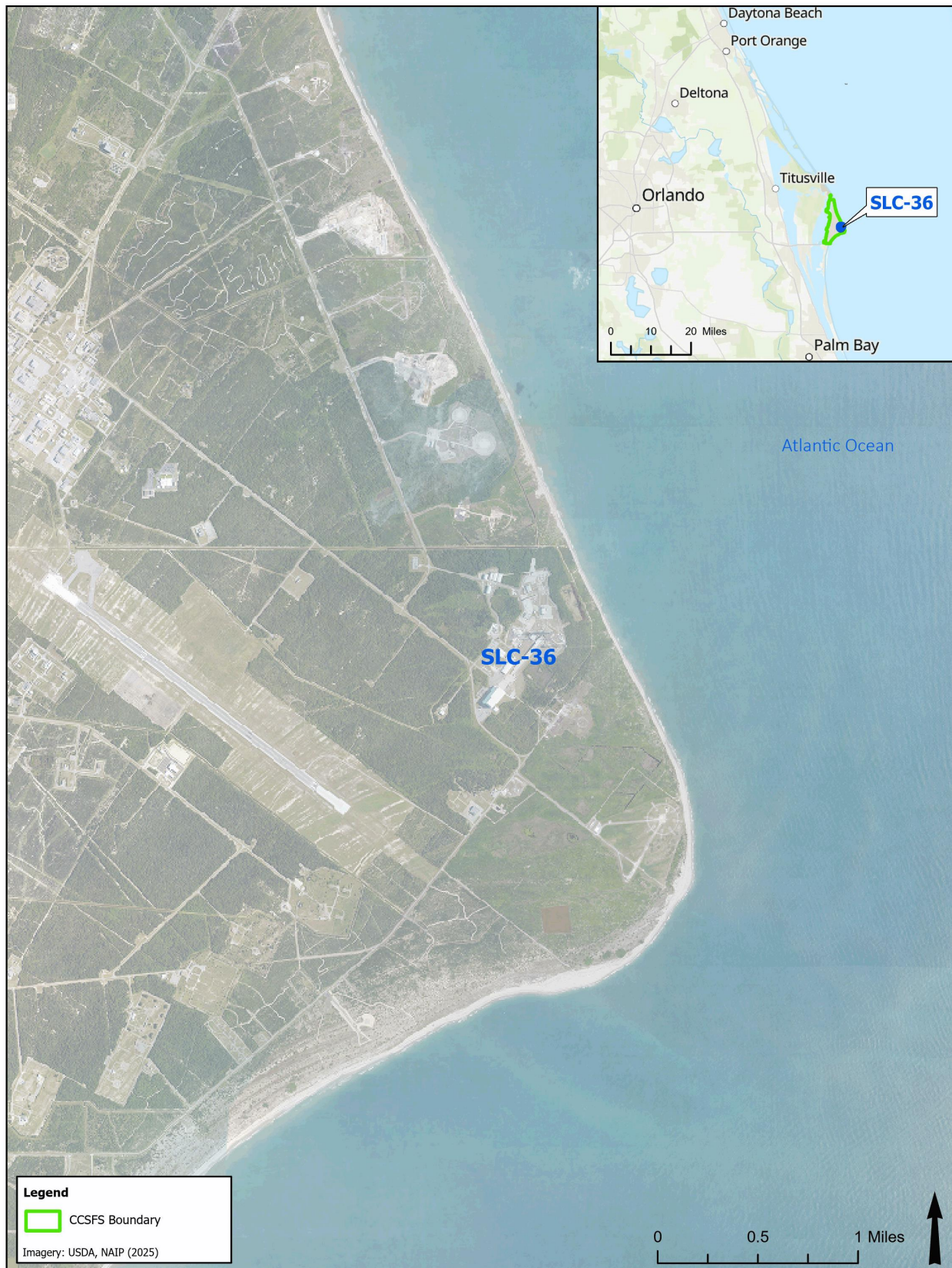


Figure 1.1-1. Location of SLC-36 at CCSFS

FAA issued a vehicle operator license to Blue Origin in December 2024 (VOL 24-133), authorizing up to 12 launches and downrange landings per year for up to 5 years. The Proposed Action now under consideration includes an operational cadence of up to 50 launches (and downrange landings and payload fairing recovery) per year from SLC-36, with the potential for associated pre-launch testing (stage static fires) prior to each launch in current planning assumptions. This shift represents a substantial operational change from the previously evaluated and licensed level (up to 12 launches per year) and triggers the need to update FAA's licensing review and conduct a new NEPA review to ensure the applicable set of resource topics remain adequately addressed under the expanded operations envelope.

This EA, therefore, builds from the 2016 DAF EA, while recognizing that a proposed increase in launch operations represents a change in the intensity and frequency of operations that must be evaluated under NEPA.

1.2 Federal Agency Roles

1.2.1 Federal Aviation Administration

As the lead federal agency, FAA is responsible for analyzing the potential environmental effects of the Proposed Action. The Commercial Space Launch Act of 1984, as amended and codified at 51 U.S.C. §§50901–50923, authorizes the Secretary of Transportation to oversee, license, and regulate commercial launch and reentry activities and the operation of launch and reentry sites within the United States or as carried out by U.S. citizens. Section 50903 requires the Secretary of Transportation to encourage, facilitate, and promote commercial space launches and reentries by the private sector. Section 50905 directs the Secretary of Transportation to exercise this responsibility consistent with public health and safety, safety of property, and the national security and foreign policy interests of the United States. The Secretary of Transportation has delegated authority to carry out these functions to the FAA Administrator (see 49 CFR §1.83(b)). FAA is also responsible for creating airspace closure areas consistent with the statutory mandate in 49 U.S.C. §40103 to ensure the safe and efficient use of the National Airspace System (NAS). FAA implements this mandate in accordance with FAA Order 7400.2R, *Procedures for Handling Airspace Matters*.

FAA's federal action is to issue a license modification under 14 CFR part 450 within the scope of operations analyzed in this EA to Blue Origin that would allow Blue Origin to conduct an increased number of New Glenn launches at SLC-36. In addition, as an associated action, FAA must also approve related airspace closures for New Glenn launch and landing operations in the Atlantic Ocean. Successful completion of the environmental review process does not guarantee that FAA would issue a license modification to Blue Origin (under 14 CFR part 450), license renewal, or approve related airspace closures.

1.2.1.1 Cooperating and Participating Agencies

FAA invited agencies with jurisdiction by law or special expertise relevant to the Proposed Action to participate as cooperating agencies. The DAF is a cooperating agency because the Proposed Action would occur on DAF property managed by the U.S. Space Force (USSF) under real property and other agreements between the DAF and Blue Origin, because of the DAF's responsibilities

under 10 U.S.C. §§2273 and 2276, and based on the USSF's special expertise related to operations and environmental resources along the Eastern Range.² As the property and associated resource manager, the DAF is also the lead agency for the U.S. Fish and Wildlife (USFWS) Endangered Species Act (ESA) Section 7 and National Historic Preservation Act (NHPA) Section 106 regulatory consultations. NASA is participating based on special expertise related to operations and environmental resources in the broader Kennedy Space Center (KSC) / Cape Canaveral region and the need for potential interagency coordination for range and recovery activities. The USCG is participating based on special expertise and authorities related to maritime navigation safety and coordination of marine hazard areas and public notices during launch and recovery operations.

1.3 Purpose and Need for the Proposed Action

FAA's authority with respect to Blue Origin's vehicle operator license and license modification is stated in section 1.2.1, *Federal Aviation Administration*. The purpose of FAA's federal action is to evaluate and act on Blue Origin's request to support an increase in New Glenn operations at SLC-36 at CCSFS, including any associated FAA actions (e.g., vehicle operator license action and airspace closures), while meeting FAA's responsibilities to protect public health, safety, and property and to consider national security and foreign policy interests, consistent with federal law and regulations.

For Blue Origin and the DAF, the purpose of the Proposed Action is to increase Blue Origin's and the USSF's capabilities at CCSFS by increasing New Glenn's flight opportunities.

FAA needs to make an informed decision under NEPA to support its licensing/approval responsibilities because Blue Origin is proposing to increase New Glenn launches at SLC-36 from a previously approved level (up to 12 launches per year) to up to 50 launches per year. This increase requires federal review before FAA can authorize/approve the related commercial launch activities and associated airspace actions.

For the Department of Defense (DoD) specifically, the Proposed Action is needed to fulfill (in part) 10 U.S.C. §2276(a), "Commercial space launch cooperation," authorizing the Secretary of Defense to maximize the use of the capacity of the space transportation infrastructure of the DoD by the private sector in the United States; maximize the effectiveness and efficiency of the space transportation infrastructure of the DoD; reduce the cost of services provided by the DoD related to space transportation infrastructure and launch support facilities and space recovery support facilities; encourage commercial space activities by enabling investment by covered entities in the space transportation infrastructure of the DoD; and foster cooperation between the DoD and covered entities.³

² The Eastern Range is a primary U.S. rocket range and spaceport managed by Space Launch Delta 45 (SLD 45) of the USSF. It encompasses approximately 15 million square miles, stretching from the Florida mainland through the South Atlantic and into the Indian Ocean. Headquartered at Patrick Space Force Base, the Range provides essential infrastructure for tracking, telemetry, and flight safety for launches from both the CCSFS and KSC. Its strategic coastal location supports eastward trajectories over safe oceanic corridors, facilitating a high volume of national security, NASA, and commercial space missions.

³ "Covered entity" means a non-federal entity that is organized under the laws of the United States or of any jurisdiction within the United States and is engaged in commercial space activities.

For Blue Origin and the DAF, the Proposed Action is needed to meet current and anticipated near-term U.S. Government launch requirements for national security, space exploration, and science missions, as well as increasing commercial launch demands.

1.4 Documents Incorporated by Reference

FAA encourages incorporation of relevant material into environmental documents by reference when the effect is to cut down on bulk without impeding agency and public review of the action. Accordingly, Table 1.4-1 lists those documents incorporated by reference. Relevant portions of those documents are summarized where appropriate in this EA.

Table 1.4-1. Documents Incorporated by Reference

Document	Relevance
<u>Environmental Assessment Blue Origin Orbital Launch Site at Cape Canaveral Air Force Station Florida</u> (DAF, 2016) [FAA was a cooperating agency]	Original NEPA document for Blue Origin New Glenn launches; analyzes similar operational activities at the same location (SLC-36) as addressed in this document. Provides information regarding the affected environment and potential effects associated with operational activities.
<u>SpaceX Starship-Super Heavy Cape Canaveral Space Force Station Final Environmental Impact Statement</u> (DAF, 2025a) [FAA was a cooperating agency]	Provides baseline and affected environment information associated with the Proposed Action study areas.
<u>Final Environmental Assessment SpaceX Falcon 9 Operations at Space Launch Complex 40, Cape Canaveral Space Force Station, Florida</u> (FAA, 2025)	Provides baseline and affected environment information associated with the Proposed Action study areas.
<u>Environmental Assessment for Eastern Range Planning and Infrastructure Development Cape Canaveral Space Force Station, Florida</u> (DAF, 2023)	Provides baseline and affected environment information associated with the Proposed Action study area.
<u>Final Environmental Impact Statement – SpaceX Starship-Super Heavy Launch Vehicle at Launch Complex-39A at the Kennedy Space Center, Merritt Island, Florida. January 2026</u> . (FAA, 2026)	Addresses future launch and development activities throughout KSC. Provides information regarding baseline/existing conditions and potential effects associated with development activities within the Proposed Action study area.

Notes: KSC = Kennedy Space Center; NEPA = National Environmental Policy Act; SLC = Space Launch Complex; SpaceX = Space Exploration Technologies Corp.

1.5 Intergovernmental Coordination and Public Engagement

1.5.1 Public Engagement

FAA released the Draft EA for a 30-day public review on September 29, 2026, and published a Notice of Availability in the Federal Register and in local newspapers. The Draft EA was made available electronically on the Federal Non-rulemaking Docket Portal (Docket Number [No.] FAA-2026-9841; <https://www.regulations.gov/>) and on the FAA website at <https://www.faa.gov/space/stakeholderengagement/blue-origin-new-glenn>. FAA also distributed the Draft EA to the Florida State Clearinghouse. FAA planned a virtual public meeting on the Zoom virtual meeting platform (the FAA project website provides meeting details).

1.5.2 Native American Coordination

Executive Order (EO) 13175 of November 6, 2000, *Consultation and Coordination with Indian Tribal Governments*, charges all executive departments and agencies with engaging in regular, meaningful, and robust consultation with tribal officials in the development of federal policies that have tribal implications. On September 29, 2026, as part of Draft EA coordination, FAA initiated government-to-government consultation with the following Native American tribal leaders and Tribal Historic Preservation Officers: the Miccosukee Tribe of Indians of Florida, the Seminole Nation of Oklahoma, and the Seminole Tribe of Florida (see Appendix B, *Public and Agency Coordination*).

1.5.3 Interagency Coordination

During the development of this EA, FAA and the DAF coordinated with various local, state, and federal agencies regarding the Proposed Action and will continue to coordinate with these agencies as required. In accordance with Section 106 of the NHPA, the DAF consulted with parties interested in potentially affected historic properties. These agencies include the Florida State Historic Preservation Officer (SHPO), Miccosukee Tribe of Indians of Florida, Seminole Nation of Oklahoma, and Seminole Tribe of Florida. In accordance with Section 7 of the ESA, the DAF and FAA consulted with the USFWS, and FAA, the DAF, and NASA conducted a programmatic consultation with the National Marine Fisheries Service (NMFS) to address potential effects to ESA-listed species and critical habitat. Pursuant to the Coastal Zone Management Act (CZMA), FAA submitted this Draft EA to the Florida State Clearinghouse for review by the Florida Department of Environmental Protection (FDEP).

1.6 Permits, Approvals, and Agreements

This section provides a summary of known regulatory requirements that may need to be met, along with the known permits and approvals that may need to be obtained, before implementing the Proposed Action. Discussions with the agencies identified in this section would be necessary to understand the extent of permits and approvals required. This list is not intended to be all inclusive—there is the potential for additional required permits, approvals, or agreements.

FAA: Under 14 CFR part 450, Blue Origin would need to request from FAA a modification of its existing vehicle operator license (VOL 24-133), which currently authorizes up to 12 New Glenn launches and downrange landings of the reusable first stage booster on a sea-based landing platform vessel in the Atlantic Ocean. FAA is also responsible for creating airspace closure areas consistent with the statutory mandate in 49 U.S.C. §40103 to ensure the safe and efficient use of the NAS.

Section 4(f) of the U.S. Department of Transportation (DOT) Act Consideration: Under 49 U.S.C. §303, before approving a project that uses a Section 4(f) property, FAA must determine that there is no feasible and prudent alternative that avoids the Section 4(f) property and that the project includes all possible planning to minimize harm to the property. Section 4(f) pertains to effects to subject properties from direct contact and public accessibility, as well as constructive uses that may include effects from noise and airspace restrictions associated with the Proposed Action. As described in section 3.1, *Introduction*, FAA has made a preliminary determination that the

Proposed Action would not result in a “use” of a Section 4(f) property. After the public comment period, FAA will make a final determination in the Final EA. See section 3.1 for more information on Section 4(f) as applied to the Proposed Action.

NHPA Section 106 Consultation: Section 106 of the NHPA requires federal agencies to consider the effect of federal undertakings on historic properties, including historic, archaeological, and cultural resources. As part of the NHPA Section 106 process, the DAF consulted with the Florida SHPO and federally recognized tribes to assess the potential effects of the Proposed Action on historic properties. On July 28, 2026, the Florida SHPO provided concurrence that the proposed undertaking would have no effect on historic properties (see Appendix A.2, *National Historic Preservation Act (NHPA)*). On August 11, 2026, the Seminole Tribe of Florida indicated they had no concerns with the Proposed Action; no other tribes responded to requests for input. See section 3.4, *Historical, Architectural, Archaeological, and Cultural Resources*, for more information on the Section 106 process for this Proposed Action.

ESA Section 7 Consultation: ESA Section 7 requires all federal agencies to ensure that any action authorized, funded, or carried out is not likely to jeopardize the continued existence of any listed species or destroy or adversely modify designated critical habitat. Section 4(a)(3)(B)(i) of the ESA was amended by the National Defense Authorization Act of 2004 to preclude designation of critical habitat on lands owned or controlled by the DoD that are subject to an approved Integrated Natural Resources Management Plan (INRMP) developed under the Sikes Act Improvement Act of 1997 (16 U.S.C. §670a), provided that the INRMP benefits the species for which critical habitat is proposed. Because an INRMP that provides such benefits is in place for CCSFS (DAF, 2025b), critical habitat is therefore not designated on the installation. The DAF is the lead agency for ESA Section 7 consultation with the USFWS. The DAF sent a Biological Conference Assessment to the USFWS in September 2026. The DAF determined that the Proposed Action may affect, but is not likely to adversely affect, 10 listed species and is not expected to jeopardize the continued existence of two species proposed for listing under the ESA. The DAF also determined that the Proposed Action may affect, and is likely to adversely affect, seven listed species (for species, see section 3.3.4, *Biological Resources, Environmental Consequences*, and Appendix A.1, *Endangered Species Act Section 7 Consultation*). In the programmatic ESA Section 7 consultation with NMFS, FAA, the DAF, and NASA determined that the activities included in the programmatic consultation may affect, but are not likely to adversely affect, ESA-listed species and critical habitat. Blue Origin’s proposed New Glenn operations are within the scope of the programmatic consultation. On May 4, 2026, NMFS issued a Programmatic Letter of Concurrence (PLOC), concurring with the action agencies’ determination. See section 3.3, *Biological Resources*, for more information about ESA Section 7 consultation.

Bald and Golden Eagle Protection Act (BGEPA): The BGEPA prohibits the take; possession; sale; purchase; barter; offer to sell, purchase or barter; transport; and export or import of any bald or golden eagle, alive or dead, including any part, nest, or egg, unless allowed by permit. Coordination with the USFWS under the BGEPA is conducted as part of the NEPA process through EA review (section 3.3, *Biological Resources*).

Migratory Bird Treaty Act (MBTA): Birds, both migratory and most native-resident bird species, are protected under the MBTA. Per the MBTA, it is unlawful by any means or in any manner, to

pursue, hunt, take, capture, kill; attempt to take, capture, or kill; or possess migratory birds or their nests or eggs at any time, unless permitted by regulation. Effects on migratory birds and compliance with the MBTA are addressed as part of the NEPA process. It is Blue Origin's responsibility to comply with the requirements of the MBTA. As required by EO 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds*, FAA will coordinate with the DAF to consider any measures that Blue Origin may be required to implement to reduce effects to migratory birds (section 3.3, *Biological Resources*).

Marine Mammal Protection Act (MMPA): All marine mammals are protected under the provisions of the MMPA. The MMPA prohibits any person or vessel from "taking" marine mammals in the United States or the high seas without authorization. The Proposed Action is not likely to result in the incidental take (as defined under the MMPA) of marine mammals under NMFS jurisdiction, so MMPA authorization is not required. See section 3.3, *Biological Resources*, for discussion of potential effects to marine mammals.

Magnuson-Stevens Fishery Conservation and Management Act (MSA): The MSA requires the identification of the potential effects of, and conservation recommendations for, actions that may adversely affect essential fish habitat (EFH). FAA has determined that the Proposed Action would not adversely affect EFH or measurably reduce the quantity of EFH for managed fisheries; thus, consultation with NMFS under the MSA is not required.

CZMA: Section 307 of the CZMA—federal consistency provision—provides states with a tool to manage coastal uses and resources and to facilitate cooperation and coordination with federal agencies. A non-federal entity applying to the Federal Government for a license or permit is subject to the requirements of CZMA §307(c)(3)(A) (16 U.S.C. §1456(c)(3)(A)) and 15 CFR part 930, subparts A, B, and D. All federal license or permit activities occurring in the coastal zone are deemed to affect coastal uses or resources if the state Coastal Management Program (CMP) has listed the particular federal license or permit in its federally approved CMP. FAA commercial space licenses and permits are not currently listed on any state's federally approved CMP. For unlisted activities, a state CMP may notify the federal agency, applicant, and the Director of the National Oceanic and Atmospheric Administration's Office of Ocean and Coastal Resource Management (Director) of unlisted activities affecting any coastal use or resource, which require state review within 30 days from notice of the license or permit application that has been submitted to the federal agency; otherwise, the state waives its right to review the unlisted activity. Following state notification to the federal agency, applicant, and the Director, the federal agency must not issue the license or permit until the requirements of 50 CFR part 930, subpart D, have been satisfied, unless the Director denies the state's request to review the activity. If the Director denies the state's request, the federal agency may approve the license or permit application and the applicant need not comply with the requirements of subpart D. If the Director approves the state's request, the federal agency and applicant must comply with the consistency certification procedures of subpart D. FAA is notifying the State of Florida of Blue Origin's proposed license modification via its submission of the Draft EA to the Florida State Clearinghouse. The State of Florida will have 30 days to determine if it wants to review the unlisted activity.

FDEP Environmental Resource Permit (ERP) and Wastewater Permit Program and National Pollutant Discharge Elimination System (NPDES) Stormwater Program: The State of Florida operates the ERP program, which regulates activities that would affect wetlands, alter surface water flows, or contribute to water pollution, as well as dredging and filling in wetlands and other surface waters. The State of Florida also administers the NPDES program within the state. Any discharge of a pollutant from a point source to surface waters (i.e., the navigable waters of the United States or beyond) requires an NPDES permit. FDEP also administers the Industrial Wastewater Permit program. The State of Florida derives its authority to regulate federal activities via Sections 401 and 402 of the Clean Water Act. See section 3.1, *Introduction*, and section 3.5, *Natural Resources and Energy Supply*, for more information about these programs as applied to the Proposed Action. Blue Origin currently holds the following permits for operations at SLC-36:

- St. Johns River Water Management District (SJRWMD) ERP (Permit No. 145022-9) – permit modification may be required due to increased deluge water use associated with an increase in operations.
- SJRWMD permit to operate a stormwater management system for SLC-36 Environmental Control System Building and hydrogen peroxide system sump industrial wastewater pretreatment (Permit No. 145022-9) – permit modification may be required to address wastewater generation from an increase in operations.
- FDEP industrial wastewater facility permit for operation of the hydrogen peroxide system (Permit No. FLAB07467) – permit modification may be required to address wastewater generation from an increase in operations.
- FDEP industrial wastewater facility permit for the use of existing dry retention ponds for the final disposition of deluge water (Permit No. FLAB07454) – permit modification may be required to address increased deluge water associated with an increase in operations.

Chapter 2. Description of Proposed Action and Alternatives

NEPA requires FAA to consider the purpose and need for the Proposed Action and from that, “study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources.” FAA has not identified any unresolved conflicts concerning alternative uses of available resources associated with the Proposed Action (Chapter 3, *Affected Environment and Environmental Consequences*). Therefore, in accordance with NEPA as amended and FAA Order 1050.1G, section 1.5(b)(ii), this EA only considers the No Action Alternative and the Proposed Action.

2.1 Proposed Action

The Proposed Action is to increase New Glenn operations at SLC-36 at CCSFS to support future U.S. Government and commercial launch service needs (Figure 1.1-1). This action would require FAA’s issuance of a modification to the existing Blue Origin vehicle operator license (VOL 24-133). The Proposed Action also involves utilization of an updated New Glenn launch vehicle as described below.

2.1.1 Launch Vehicle

The New Glenn launch vehicle is a two-stage orbital rocket⁴ that is approximately 320 feet tall and 23 feet in diameter (Figure 2.1-1). New Glenn’s first stage is powered by seven BE-4 engines using liquid oxygen (LOX) and liquefied natural gas (LNG) as primary propellants and the second stage (upper stage) powered by two BE-3U engines using LOX and liquid hydrogen (LH₂) as propellants. The 2016 DAF EA previously described the New Glenn launch vehicle as an orbital launch vehicle with approximately 4.5 million pounds-force (lbf) of thrust comprising Stage 1 consisting of “an array” of Blue Origin’s BE-4 engines, and Stage 2 consisting of a single BE-4 engine. The primary updates to the launch vehicle since the 2016 DAF EA are a slight increase in thrust, with the potential to generate approximately 4.62 million lbf of thrust at lift-off as designed, and the addition of a second engine on the second stage.

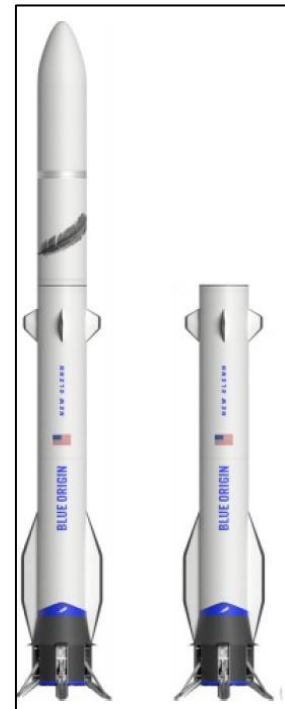


Figure 2.1-1. New Glenn Launch Vehicle

2.1.2 Launch Operations

New Glenn operations at SLC-36 would consist of a repeating cycle of pre-launch preparations, test events, launches (between 35 and 118 degrees, which are launch trajectories already established for the New Glenn program), first stage landings on a landing platform vessel in the Atlantic Ocean,⁵

⁴ New Glenn is designed to support an optional third stage. This mission unique element can be added for in-space maneuverability/transportation.

⁵ Mission objectives may occasionally require expending the first stage in the Atlantic Ocean. If expended, the first stage would break up upon atmospheric reentry. The second stage is either placed in a disposal orbit or breaks up upon atmospheric reentry. Debris would be expected to sink to the bottom of the ocean.

and payload fairing disposal or recovery, followed by recovery and refurbishment activities to support subsequent missions. Figure 2.1-2 shows the concept of operations.

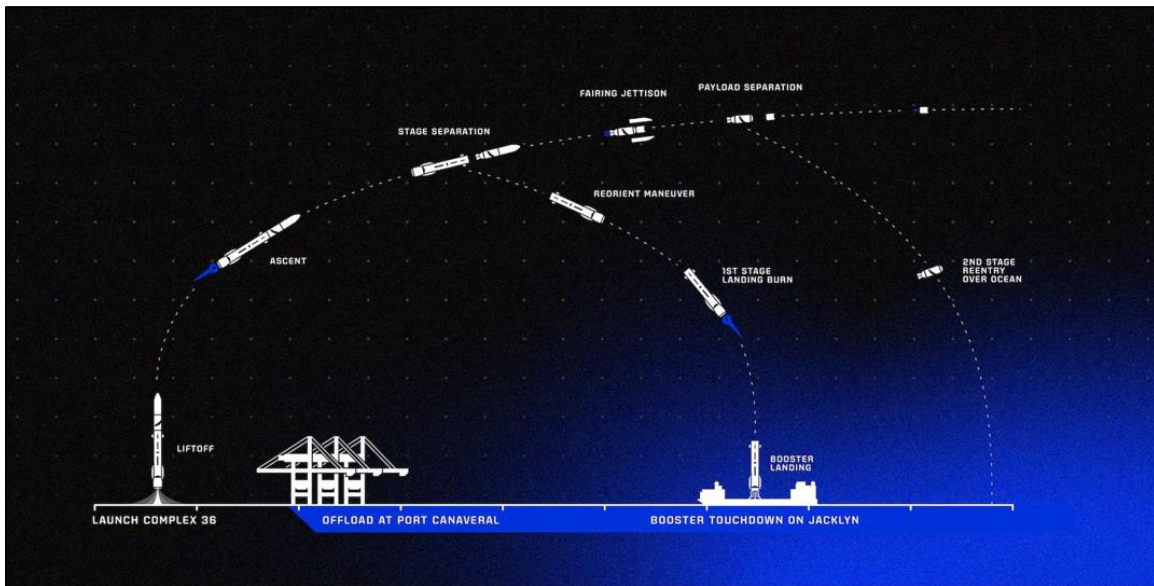


Figure 2.1-2. SLC-36 New Glenn Operations

In May 2026, Blue Origin experienced an anomaly during a New Glenn static fire test. In addition to the loss of the launch vehicle, some elements of the pad infrastructure (e.g., transporter-erector, towers, etc.) were damaged or destroyed. Blue Origin is rebuilding its infrastructure and supporting facilities at SLC-36 in accordance with a categorical exclusion issued by Space Launch Delta 45 (SLD 45) in June 2026. The rebuilt infrastructure at SLC-36 is located within the existing disturbed footprint of the launch site and is substantially similar to previous pad infrastructure with a few key improvements. The new concept of operations entails a crane lift for the New Glenn launch vehicle instead of the transporter-erector, and umbilical connections are made between the vertical access tower and the launch vehicle.

The operational tempo would include up to 50 launches and downrange first stage ocean platform landings (Figure 2.1-3) on a recurring basis. Figure 2.1-4 shows the range of potential launch azimuths and potential landing platform vessel locations. Up to 50 static fire tests of both the integrated launch vehicle (ILV; entails a short-duration engine burn of the first stage) and second stage (a total of up to 100) could be conducted as part of the pre-launch process to verify vehicle readiness. Blue Origin does not anticipate conducting static fires prior to each launch; however, this quantity is used for planning and analysis purposes.



Figure 2.1-3. New Glenn First Stage Ocean Landing Platform

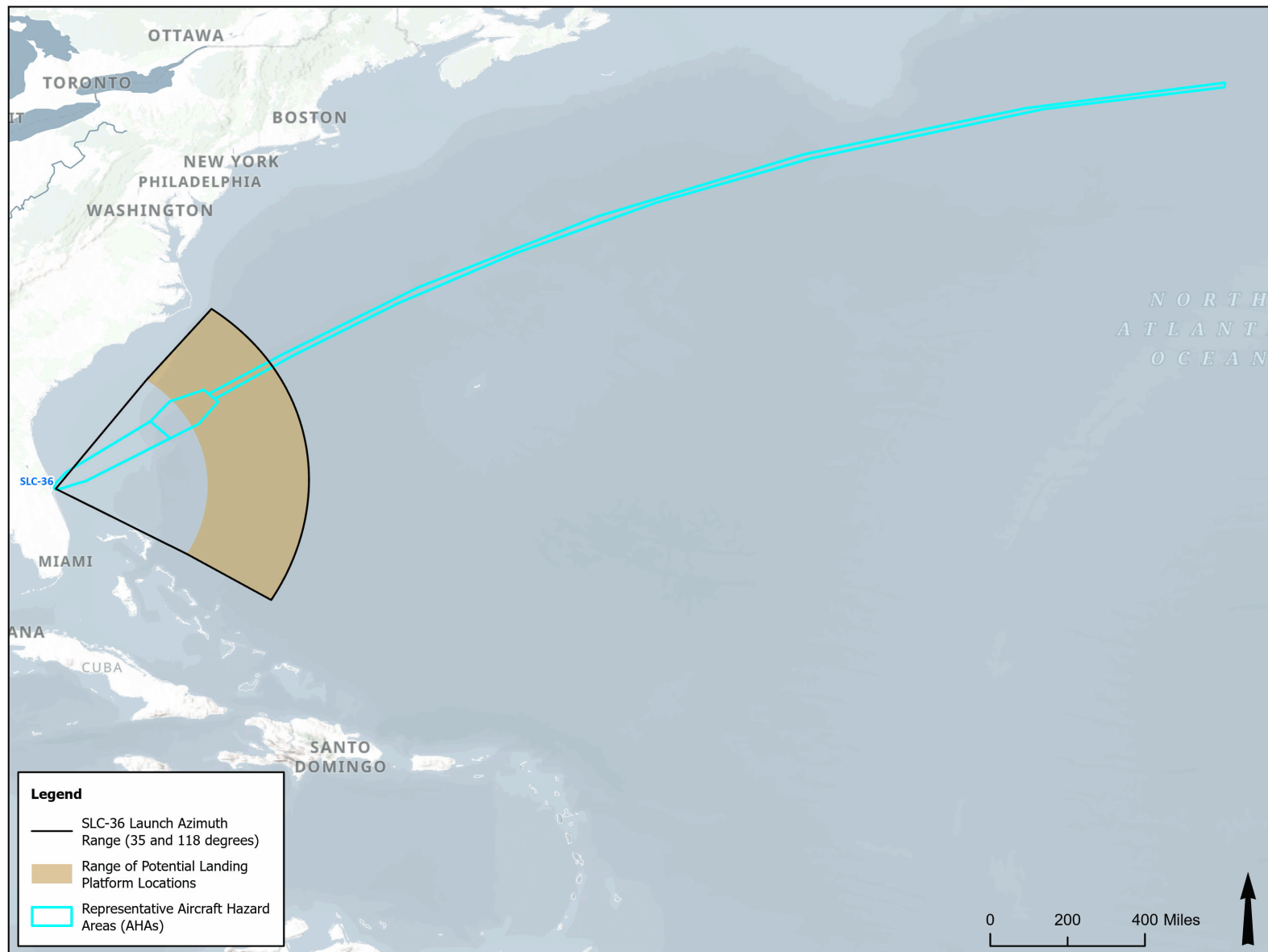


Figure 2.1-4. Range of Potential Launch Azimuths and Potential Landing Platform Locations

For purposes of analysis in this EA, it is assumed that half of all static fires and launches would occur at acoustic night⁶ (between 10:00 p.m. and 7:00 a.m.).

During a typical New Glenn mission, the payload fairing (the protective aero-shell around the payload) would separate into two halves high above Earth once it is no longer needed. Blue Origin is currently pursuing the development of reusable payload fairings. In this concept of operations, after fairing separation each fairing half's orientation would be controlled by a reaction control system so it stays in a stable configuration as it reenters the atmosphere and descends toward a planned offshore recovery area in the Atlantic Ocean.

As the fairing descends, a sequence of parachutes would deploy to further control and decelerate the fairing in a controlled manner. Recovery crews on support vessels would use small boats to approach the fairing after splashdown, attach recovery lines, and add flotation devices as needed to keep it stable. The fairing would then be towed back to the support vessel, lifted onboard, secured on deck, and transported to Port Canaveral and ultimately Blue Origin facilities for inspection and refurbishment for potential reuse. These recovery activities would occur offshore within the mission's designated maritime hazard area and would be short-term (recovery operations are typically hours to a couple of days depending on distance downrange and sea state), involving only the recovery vessel, its small boats, and associated support equipment.

Airspace Coordination/Closures

All New Glenn operations would comply with necessary notification requirements, including issuance of Notices to Airmen (NOTAMs), as defined in agreements required for a vehicle operator license issued by FAA. A NOTAM provides notice of unanticipated or temporary future closures to components of, or hazards in, the NAS (FAA Order 7930.2U, NOTAM). FAA issues a NOTAM at least 48 hours prior to a launch or reentry activity in the airspace to notify pilots and other interested parties of temporary conditions. NOTAMs are similarly used by foreign Air Navigation Service Providers to provide notice of temporary airspace closures in their airspace. Advance notice via NOTAMs and the identification of Aircraft Hazard Areas (AHAs)⁷ assist pilots in scheduling around any temporary disruption of flight activities in the area of operation.

The location and size of airspace closures for commercial space operations also vary with each mission type and are influenced by multiple factors, including prior flight history. FAA used a representative recent New Glenn AHA⁸ to complete an NAS assessment of the airspace closures for this EA. The AHAs define the temporarily closed airspace that would be established and published through a NOTAM prior to the launch/reentry.

⁶ The acoustic time of day distribution is used to account for increased sensitivity to noise at night when computing the day-night average sound level (DNL) metric, which applies an additional 10-decibel (dB) adjustment (i.e., 10 times weighting) to events during the acoustic nighttime. Refer to section 3.2, *Noise and Noise-Compatible Land Use*, for more information.

⁷ Hazard areas are any region of land, sea, or air that must be surveyed, publicized, controlled, or evacuated to control the risk to the public. It includes regions of land, sea, and air potentially exposed to hazardous debris generated during normal flight events and all reasonably foreseeable failure modes.

⁸ It is expected that the AHAs will reduce in size as the program matures, more data is available, and the reliability of the launch vehicle improves.

Launches and First Stage Landings

New Glenn launches and first stage landings⁹ would affect air routes extending eastward from the launch site over portions of the Atlantic Ocean. AHAs may necessitate the closure of a dozen air traffic routes around the launch site for New Glenn launches, and further downrange where the first stage conducts a platform landing and payload fairings are expended or recovered in the future. The southernmost launch trajectories could affect the airspace of the Bahamas. As necessary, the Bahamas would be expected to close its airspace up to 6,000 feet, and FAA would close the airspace above that level. See Figure 2.1-4 for a depiction of the range of launch trajectories and associated AHAs.

Maritime Coordination

All New Glenn operations would comply with necessary notification requirements, including issuance of a Notice to Mariners (NOTMAR), as defined in agreements required for a vehicle operator license issued by FAA. A NOTMAR provides a notification regarding a temporary hazard within a defined area (a ship hazard area) to ensure public safety during proposed operations. A NOTMAR itself does not alter or restrict vessel movement; rather, the NOTMAR disseminates relative information regarding maritime activity and temporary hazards within a defined area to ensure public awareness and safety during the proposed operations.

To comply with FAA's licensing requirements, Blue Origin has agreed through a Letter of Intent with the USCG to establish procedures for the issuance of a NOTMAR prior to a launch, as well as other measures necessary to protect public health and safety, promoting safe operations over navigable waters. The Letter of Intent describes the required responsibilities and procedures for both Blue Origin and the USCG during the event, which may include launch or landing operations resulting in the issuance of a NOTMAR.

The USCG publishes NOTMARs through multiple media platforms, to include Local NOTMAR, Broadcast NOTMAR, and Navigational Telex, as needed, to inform the maritime community of temporary changes in condition, Limited Access Areas (LAAs), Regulated Navigation Areas (RNAs), and hazards on navigable waterways. Notices in international areas are published by the National Geospatial Intelligence Agency. Advance notice via a NOTMAR and the identification of ship hazard areas would assist mariners in voyage planning and scheduling around any temporary operation.

The USCG has broad authority to establish LAAs, which may include Safety and Security Zones, and RNAs on navigable waters subject to U.S. authority and schedule in advance to minimize interruption to the maritime community. Launches (up to 50 per year) and landings (up to 50 downrange on a landing platform vessel) would be of short duration and scheduled in advance to minimize interruption to ship traffic. All launch and landing operations would comply with necessary notification requirements, including issuance of NOTMARs by the USCG, as defined in agreements required for a vehicle operator license issued by FAA. The USCG maintains authority to establish and enforce LAAs and RNAs as needed to support public health and safety during these events.

⁹ First stage landings are included in the launch AHAs and are assumed to occur within approximately 10 minutes of a New Glenn launch.

A number of spotter aircraft, including drones, and surveillance vessels (or boats) are used during launch activities to ensure that designated hazard areas are clear of nonparticipating crafts. Combinations of radar, visual spotter aircraft, surface surveillance, and law enforcement vessels may be deployed prior to launch. Most fixed-wing aircraft operate at altitudes of 15,000 feet but may drop to 1,500 feet to obtain a call sign visually from a nonparticipating vessel.

2.1.3 Trajectories and Downrange Landing and Recovery

The range of potential launch trajectories from SLC-36 (between 35 and 118 degrees, within the range analyzed in the 2016 DAF EA (DAF, 2016)) is shown in Figure 2.1-4. Each trajectory is provided in Blue Origin's Flight Safety Data Package and submitted to FAA and SLD 45 in advance of launch. Downrange landing locations in the Atlantic Ocean would occur up to 50 times per year and would typically be located between 300 and 500 nautical miles from the launch point. Vessel support for launch and landing operations includes surveillance and security support vessels (e.g., patrol boats), a tugboat, and a landing platform. An additional support vessel would be utilized to collect floating payload fairing debris and recover intact payload fairing halves. The transit route for the support vessels used in recovery operations to and from the planned landing location would originate from Port Canaveral and would be navigated via the most direct route, with course corrections as needed, to avoid weather, the Gulf Stream, shallow obstacles, etc.

2.1.4 Payloads

New Glenn is expected to carry a mix of commercial, civil, and national security spacecraft, typically packaged as one primary payload (or multiple payloads, depending on mission design) housed inside the payload fairing. Anticipated payloads may include satellites and experimental payloads that may include typical spacecraft subsystems and materials such as onboard propulsion systems (often using hypergolic propellants and, in some cases, solid propellants) used for orbit-raising, station-keeping, or maneuvering; standard separation and deployment devices (e.g., mechanical systems and small explosive or pyrotechnic components used for stage/payload separation); and batteries and pressurized systems typical of modern spacecraft. Overall, New Glenn payloads are anticipated to be conventional spacecraft payloads processed using established payload processing procedures, with hazardous materials handling consistent with routine spacecraft integration and launch site safety requirements (DAF, 2016; NASA, 2011).

2.1.5 Ground Support, Transport, and Vehicle Refurbishment

The primary commodities that New Glenn is expected to use are LOX, LNG, and LH₂ for launches and static fires. Using conservative assumptions for typical cryogenic tanker capacities, the Proposed Action (up to 50 launches and up to 100 static fire tests annually) assumes an average of approximately 15,000 trucks per year (or approximately 41.1 trucks per day, on average) delivering propellants to CCSFS. These figures are order-of-magnitude estimates; actual truck trips could be lower or higher because deliveries typically occur to maintain onsite storage tank inventory and may be scheduled over multiple days based on existing tank levels, delivery windows, operational tempo, and boiloff/handling considerations rather than occurring as a fixed "number of trucks per event."

Roadway transportation routes of the first stage and fairing halves would remain the same as those analyzed in the 2016 DAF EA (DAF, 2016). The rate increase would result in additional large

hardware movements to the launch pad from the manufacturing complex on Merritt Island and Port Canaveral, and from the launch pad back to the manufacturing complex. The primary transport route for large hardware (e.g., first stage) coming to the pad from the manufacturing complex is along Kennedy Parkway, Saturn Causeway, and Phillips Parkway. From the port, the first stage travels north on Phillips Parkway. Some additional personal vehicle traffic may also occur; however, this is not anticipated to be substantial enough to affect local roadways.

2.1.6 Water Use

Water use is an important supporting element of operations, particularly for reducing heat and noise during certain test and launch activities and pad fire protection. A large onsite water storage and distribution system supports a noise/heat suppression (deluge) function that is used during stage test and launch events, after which the system is refilled for future operations. Deluge water is managed through onsite drainage and is captured in a grass retention pond, with discharges managed in accordance with SJRWMD and FDEP permits and associated operational controls identified in section 1.6, *Permits, Approvals, and Agreements*, which includes sampling requirements. No treatment of deluge water is conducted or required per the permits.

As discussed previously, operations at the launch site would consist of up to 50 launches, up to 50 ILV static fires, and up to 50 second stage static fires (collectively referred to as static fires). Blue Origin conservatively estimates that SLC-36 launch operations would use/require up to approximately 2.75 million gallons (MG) per ILV hot fire (137.5 MG annually), 2.75 MG per launch (137.5 MG annually), and up to approximately 350,000 gallons per second stage static fire test (17.5 MG annually) for a total of up to approximately 292.5 MG annually. Some water may be left in the trench after ILV hot fire to be used during subsequent launch activity, and the number of both ILV hot fires and second stage static fires would be anticipated to decline as the program matures; this would serve to reduce water use over time. Further, Blue Origin is evaluating options for reducing water use in the future.

2.2 No Action Alternative

Under the No Action Alternative, FAA would not modify Blue Origin's existing vehicle operator license for increased operations at SLC-36; Blue Origin would continue to be authorized to launch up to 12 times annually. The No Action Alternative would not meet the purpose and need.

Chapter 3. Affected Environment and Environmental Consequences

3.1 Introduction

Consistent with FAA Order 1050.1G, this EA considers the reasonably foreseeable effects of the Proposed Action and alternatives as part of the environmental consequences analysis. Reasonably foreseeable effects are direct or indirect effects of the proposed action.

Launch and landing activities, infrastructure development and improvements at CCSFS and KSC, and continued economic and community growth and development within the areas surrounding CCSFS and KSC all contribute to the existing (baseline) and future environmental condition and provide context for reasonably foreseeable effects analysis under both the Proposed and No Action Alternatives. Many of these occurrences are described in the documents referenced in Table 1.4-1.

For context, the Eastern Range currently accommodates over 100 launches (and associated engine testing) per year from both government (e.g., NASA, USSF) and commercial providers, including Blue Origin, Space Exploration Technologies Corp. (SpaceX), United Launch Alliance, and Relativity. Since 2011, the number of launches from the Eastern Range has increased by more than 1,500 percent and continues to increase (NASA, 2026). SLD 45 expects, and is planning towards, approximately 500 launches per year by 2030, which would include multiple launches per day (Albon, 2026; USSF, 2024).

The resources assessed in detail in this EA include noise and noise-compatible land use; biological resources (including fish, wildlife, and plants); historical, architectural, archaeological, and cultural resources; natural resources and energy supply; health and safety; and aviation emissions and air quality. The study area varies based on the environmental effect category being analyzed and is defined for each environmental effect category in this chapter. The level of detail provided in this chapter is commensurate with the importance of the potential effect on the environmental effect categories. Documents incorporated by reference are identified in each resource section and provided in Table 1.4-1. Technical data such as noise modeling (*Noise Study for Blue Origin New Glenn Operations at CCSFS [Launch Complex] LC-36 [March 2026]*) and air emissions modeling (*Emissions Study for Blue Origin New Glenn Operations at CCSFS LC-36*) and information from regulatory consultations for threatened and endangered species (*USFWS Biological and Conference Assessment [BCA] for Blue Origin New Glenn Cadence Increase at SLC-36, NMFS Reinitiation of the Programmatic Letter of Concurrence for Space Launch and Reentry Operations*) and historic properties (NHPA Section 106 consultation for Blue Origin New Glenn Cadence increase at SLC-36) are included in referenced appendices to this EA. For example, ESA Section 7 consultations require detailed discussions of potentially affected species as well as detailed analyses of potential effects. To meet 42 U.S.C. §4332, the consultation documentation is provided in Appendix A.1, *Endangered Species Act Section 7 Consultation*, and the relevant information is incorporated by reference rather than repeating it in the body of the EA.

3.1.1 Resource Areas Considered but Eliminated from Detailed Analysis

Based on the scope of the Proposed Action, and in consideration of other similar actions addressed in the NEPA documents referenced in section 1.4, *Documents Incorporated by*

Reference, of this EA, the following issues and resources have not been carried forward for detailed analysis because of the lack of or minimal potential for reasonably foreseeable adverse effects based on the rationale provided:

- Coastal Resources – The Proposed Action does not involve construction activity or disturbance of coastal resources. The Proposed Action is consistent with CCSFS operations and activities within the context of the Space Coast. As a result, the Proposed Action would have no adverse effects on coastal resources. As noted in section 1.6, *Permits, Approvals, and Agreements*, FAA is notifying the State of Florida of Blue Origin’s proposed license modification via its submission of the Draft EA to the Florida State Clearinghouse. Florida may or may not request to review the project under the CZMA and the CZMA implementing regulations.
- DOT Act §303 (referred to as “Section 4(f)”) and Land and Water Conservation Fund (referred to as “Section 6(f)”) – Resources that are protected by Section 4(f) are publicly owned land from a public park, recreation area, or wildlife and waterfowl refuge of national, state, or local significance and publicly or privately owned land from a historic site of national, state, or local significance. Substantial impairment occurs when the activities, features, or attributes of the resource that contribute to its significance or enjoyment are substantially diminished. Section 6(f) prevents conversion of lands purchased or developed with Land and Water Conservation Fund Act funds to non-recreation uses, unless the Secretary of the U.S. Department of the Interior, through the National Park Service, approves the conversion. No Section 6(f) lands would be affected, and therefore Section 6(f) does not apply to the Proposed Action.

Section 4(f) includes historic properties, which are located within the action area (see section 3.4, *Historical, Architectural, Archaeological, and Cultural Resources*). However, based on other resource area analyses in this EA (e.g., noise and noise-compatible land use; historical, architectural, archaeological and cultural resources; etc.) and in the data and analyses contained in the other documents identified in section 1.4, *Documents Incorporated by Reference*, the Proposed Action does not involve impairment or diminishment of activities, features, or attributes of any Section 4(f) resources that would contribute to a property’s significance or enjoyment.

- Farmlands – No prime farmland, unique farmland, or farmland of statewide or local importance is present at CCSFS. Therefore, the Proposed Action would not affect farmlands.
- Hazardous Materials, Solid Waste, and Pollution Prevention – All hazardous materials and solid wastes would be handled in accordance with all applicable federal, state, and local laws and regulations. CCSFS has established plans and procedures associated with pollution prevention to handle and dispose of hazardous materials and solid wastes, and the increased number of launches would not exceed amounts able to be handled per U.S. Environmental Protection Agency (USEPA) regulations.
- Land Use – No changes to land use would occur as a result of the Proposed Action. Because the Proposed Action is consistent with the use of CCSFS, incompatible land use effects are not anticipated.

- Visual Effects (including light emissions) – There would be no new construction or introduction of new structures affecting the visual landscape. Lighting would be consistent with the existing visual landscape, which already consists of launch support facilities. Launch support facilities already operate under lighting management plans at CCSFS to reduce lighting effects, and activities at SLC-36 would continue this practice.
- Water Resources (including wetlands, floodplains, surface waters, groundwater, and wild and scenic rivers) – The Proposed Action does not involve disturbance of wetlands or floodplains and would not involve any construction activities resulting in construction-related stormwater runoff that would affect surface waters. Industrial stormwater and wastewater (to include management of deluge water) is addressed through the NPDES permitting process, as described in section 1.6, *Permits, Approvals, and Agreements*; this process serves to mitigate potential surface and groundwater effects from operations. No wild or scenic rivers are associated with the Proposed Action study area. As a result, no adverse effects to water resources are anticipated.
- Socioeconomics and Children's Health and Safety Risks – Significant effects to socioeconomic resources would not be anticipated because there would not be a large change in personnel that would induce substantial economic growth, disrupt or divide the physical arrangement of an established community, cause extensive relocation of residents and community businesses, substantially reduce the levels of service of roads, or produce a substantial change in the community tax base. However, operational activities would have minimal positive employment and income effects. Under the Proposed Action, operations could have potential effects to airspace and maritime activities that could result in delays and reroutes. Shipping lanes would not be altered or closed under the Proposed Action. Launches and downrange landings would be scheduled in advance to minimize interruption to ship traffic.

However, estimating the economic effect that the Proposed Action may have on airspace and maritime activities is challenging and is unlikely to produce reasonable and defensible estimates. Any estimate of the economic effect to airspace and maritime users resulting from space launch or reentry activity is sensitive to the timing of pre-launch notification as well as the timing and duration of the closure, which itself may be further affected by any off-nominal launch-related events.

The economic effects of the Proposed Action would vary substantially based on aircraft/vessel type, operational flexibility, alternative routing options, scheduling constraints, and any buffers within these operational scenarios. Economic theory also recognizes that self-interested entities whose decisions are primarily driven by gain, logical analysis, and preferences may adjust their behavior to recurring, predictable constraints. As such, airlines and other users of the airspace may incorporate known operational constraints from repeated launch and reentry operations as they become more reliable and predictable into their routing, scheduling, and pricing decisions.

Based on noise (section 3.2), health and safety (section 3.6), and air quality (section 3.7) analysis, no component of the Proposed Action would result in a disproportionate health

and safety risk to children because no adverse effects have been identified particular to children (e.g., no adverse effects to schools, daycares, playgrounds, etc.).

- Soils and Geology – The Proposed Action does not include any ground-disturbing activities. As mentioned previously, CCSFS has established plans and procedures associated with pollution prevention to handle and dispose of hazardous materials and solid wastes. Therefore, soils and geology would not be affected.

3.2 Noise and Noise-Compatible Land Use

3.2.1 Definition of Resource and Regulatory Setting

Noise is defined as unwanted sound. How people respond to noise varies with the sound's intensity, frequency content, duration, context, and time of day. Detailed noise metrics, inputs, modeling approach, and results are provided in the *Noise Study for Blue Origin New Glenn Operations at CCSFS LC-36* (March 2026) (Appendix C, *Noise Report*). This section of the EA summarizes key results of the Noise Study as they relate to potential for significant noise effects on sensitive receptors. Noise effects are evaluated in this EA using methods consistent with applicable DoW and FAA guidance. Propulsion noise generated by New Glenn operations was modeled using RUMBLE, version 4.1, and sonic booms were modeled using PCBoom. New Glenn noise levels presented in this EA reflect the configuration of the rocket as designed, with the first stage powered by seven BE-4 engines and the second stage powered by two BE-3U engines.

Noise-Compatible Land Use

Noise-compatible land use means the use of the land is normally consistent with the noise environment at the location. DoD Instruction 4165.57 and DOT regulations at 14 CFR part 150 establish that noise-sensitive land uses, such as residential areas, are generally not compatible with noise levels greater than 65 A-weighted decibels (dBA) day-night average sound level (DNL). For impulsive noise (e.g., sonic booms), 60 decibel (dB) C-weighted DNL (CDNL) is commonly treated as equivalent to 65 dB DNL for land use compatibility (Galloway, 1981; FAA, 2023). Compatibility analyses also consider special management areas (e.g., national parks and wildlife refuges) where a quiet setting is an important value.

Activity Interference

DoD Instruction 4715.13 and FAA Order 1050.1G state that the DNL metric will be used to describe the aviation noise environment and also recommend the use of supplemental noise metrics, where appropriate, to characterize specific effects such as activity interference. In this EA, supplemental metrics include maximum A-weighted sound level ($L_{A,max}$) (with 85 dBA as a common activity-interference screening level) and the duration above 66 dBA (the approximate level at which sentence intelligibility drops below 95 percent for people conversing at 3 feet). Sonic booms are impulsive and short in duration (generally less than 1 second).

Rocket launches during the late night have the potential to awaken some people who are sleeping. Awakening predictions vary by individual sensitivity and familiarity with the noise source. This EA uses the American National Standards Institute / Acoustical Society of America (2008) quantitative method, recognizing the method is generally considered overly conservative and was later rescinded (ANSI/ASA, 2018). Use of the American National Standards Institute / Acoustical Society of America

method in this EA is in accordance with guidance in the FAA Order 1050.1 Desk Reference (FAA, 2023).

Structural Damage Potential

Structural damage is possible at high noise levels or intense sonic boom overpressures. The National Academy of Sciences' *Guidelines for Preparing Environmental Impact Statements [EISs] on Noise* state that one may conservatively consider all sound lasting more than 1 second with levels exceeding 130 dB (unweighted) as potentially damaging to structures (National Academy of Sciences, 1977). A rocket ground-test study reported approximately one damage claim per 100 households exposed at 120 dB (unweighted maximum sound level [L_{max}]) and one claim per 1,000 households exposed at 111 dB (Guest & Slone, 1972); these data were based on static ground tests with generally longer exposure durations than transient launch noise and are therefore conservative for launches. Damage associated with high noise or overpressure is typically limited to lightweight or brittle elements (e.g., windows and plaster), with more massive structural elements affected to a much lesser degree. Additional discussion is provided in Appendix C, *Noise Report*.

Hearing Conservation

Hearing conservation regulations such as the Occupational Safety and Health Administration (OSHA) regulations published at 29 CFR §1910.95 are applicable to workplace environments but are also referenced in this EA as a conservative threshold for hearing conservation in non-workplace settings. OSHA identifies 115 dBA as an upper workplace limit; the 115 dBA $L_{A,max}$ contour is used here as a conservative screening tool to identify where hearing protection may be warranted during rocket operations. OSHA also specifies daily noise dose limits.

3.2.2 Study Area

The study area for noise includes the area with the potential to be affected by noise from the proposed project. The analysis focuses on areas within which individual noise and sonic booms would be most likely to be disturbing or impactful (e.g., exceeding 85 dB $L_{A,max}$ or 1 pound per square foot [psf]). The study area includes areas near SLC-36 as well as areas in or near the range of potential landing platform locations. As depicted in Figure 2.1-4, within the limits of the launch azimuth ranges, the potential landing platform locations in the Atlantic Ocean would be at distances of 37 miles or greater from land.

The closest community to SLC-36 is the City of Cape Canaveral approximately 5 miles southwest. Other urbanized areas within the study area include Cocoa Beach, portions of Merritt Island, and the City of Cocoa.

3.2.3 Existing Conditions

Rocket noise is a notable part of the acoustic environment in the study area. Noise levels in the study area when rocket operations are not underway vary by location depending primarily on the intensity and types of nearby human activities. Rural or remote areas typically have DNL less than 49 dB while urbanized commercial or industrial areas may have DNL as high as 59 dBA. During the daytime, rural or remote areas within the study area could experience equivalent sound levels below 48 dBA, while noise levels at night are likely less than 42 dBA. In urbanized commercial or industrial areas, daytime equivalent levels are typically 60 dBA and nighttime levels are typically 54 dBA (ANSI/ASA, 2013).

The tempo of launch operations has been increasing in recent years, resulting in an increased frequency of loud noise events. In 2025, there were 82 launches from CCSFS (including two New Glenn rocket launches from SLC-36) and an additional 27 launches were conducted from KSC (SpaceLaunchSchedule.com, 2026). Current/ongoing rocket operations are considered part of existing conditions within the study area. Launch-related activities that have been previously approved under separate NEPA analysis are considered contributors to the baseline noise environment even if the activity has not yet begun to occur or is not yet occurring at its maximum approved operations.

Activity Interference

When rocket operations noise levels exceed background levels, they are likely to be noticed and may interfere with activities in neighboring communities, such as conversation and sleep (FAA, 2025; DAF, 2025a; FAA, 2026). The 2016 DAF EA considered noise effects associated with up to 12 New Glenn launches from SLC-36 per year, with on-pad static fire tests (12) potentially being conducted prior to each launch, as well as up to 9 engine test activities per month at LC-11 (DAF, 2016). The 2016 DAF EA also assessed propulsion noise and sonic booms generated during offshore landings, finding that these have a minimal likelihood of affecting sensitive locations on land.

Noise-Compatible Land Use

Rocket propulsion noise levels generated by approved rocket operations (including existing New Glenn operations) are below 65 dB DNL at all locations outside of the boundaries of KSC and CCSFS that are publicly accessible during launches, as shown in Figure 3.2-18 of the Starship-Super Heavy LC-39A EIS (FAA, 2026). Sonic boom noise levels associated with other operators' approved landing operations exceed 60 dB CDNL in communities outside of KSC and CCSFS, as assessed in the Starship-Super Heavy at LC-39A EIS (FAA, 2026) and SpaceX Starship-Super Heavy at CCSFS EIS (DAF, 2025a).

Hearing Conservation

As determined in prior analyses, noise levels associated with approved operations are not expected to be sufficiently intense or frequent to pose a risk to human hearing in areas outside of CCSFS/KSC (DAF, 2016; FAA, 2025; DAF, 2025a; FAA, 2026). Existing regulations and hearing conservation programs ensure that workers on CCSFS and KSC are protected from noise levels with potential to cause hearing damage.

Structural Damage Potential

The potential for structural damage associated with noise approved rocket operations (including existing New Glenn operations) and sonic booms generated by other operators' approved landing operations has been assessed in documents including Starship-Super Heavy at LC-39A EIS and SpaceX Starship-Super Heavy at CCSFS EIS (DAF, 2025a; FAA, 2026).

3.2.4 Environmental Consequences

Potential noise effects could occur from the increased number of New Glenn static fire tests and launches at SLC-36 under the Proposed Action. Per FAA's NEPA Implementing Procedures, an action is considered significant if it would increase noise by DNL 1.5 dB or more for a noise-sensitive area that is exposed to noise at or above the DNL 65 dB noise exposure level or that would be exposed

at or above the DNL 65 dB level due to a DNL 1.5 dB or greater increase, when compared to the No Action Alternative for the same timeframe. For example, an increase from DNL 65.5 dB to 67 dB is considered a significant effect, as is an increase from DNL 63.5 dB to 65 dB. The 2026 DAF NEPA Implementing Procedures do not establish significance thresholds but instead require determination of significance based on effect context and intensity. For the purposes of this analysis, noise effects would also be considered significant if supplemental metrics indicate a dramatic increase in activity interference, an exceedance of hearing conservation criteria, or a substantial risk of widespread structural damage.

3.2.4.1 No Action

Under the No Action Alternative, there would be no change in New Glenn operations at SLC-36 or noise levels and associated reasonably foreseeable effects within the affected environment. The 2016 DAF EA considered noise effects associated with up to 12 New Glenn launches from SLC-36 per year and found no significant adverse effects (DAF, 2016).

3.2.4.2 Proposed Action

This section describes noise associated with activities that would become more frequent under the Proposed Action (i.e., New Glenn static fire tests, launches, and downrange landings).

Static Fire Tests

Individual New Glenn static fire engine test noise levels would not change relative to the static fire events being conducted at SLC-36 currently. These noise levels are described briefly in section 3.2.3, *Existing Conditions*, and in greater detail in Appendix C, *Noise Report*. The 2016 DAF EA assessed on-pad static fire tests as part of up to 12 launch operations per year, and the current Proposed Action would increase the number of first- and second stage static fire test events at SLC-36 to as many as 50 each per year.

Launch

Launch noise levels would be similar to ongoing New Glenn launches, but the number of launches per year would increase from the up to 12 launches per year assessed in the 2016 DAF EA to up to 50 per year. Sonic booms generated during launches would be the same as those currently generated by New Glenn launches and would not exceed 1 psf on land (1 psf is perceived to be similar to a clap of thunder). Launch propulsion noise and sonic booms are summarized in section 3.2.3, *Existing Conditions*, and discussed in greater detail in Appendix C, *Noise Report*.

Landings

Landings would continue to be conducted in the Atlantic Ocean, as assessed in the 2016 DAF EA. Propulsion noise and sonic booms associated with landings would occur more frequently in proportion to the proposed increase in launch tempo. Propulsion noise and sonic booms generated during landings would focus near the landing platform located within the designated landing platform range, which is larger than the landing range considered in the 2016 DAF EA. The area surrounding the at-sea landing platform would be cleared by NOTMAR to ensure the safety of nonparticipating mariners. The landing platform range is 37 miles from shore at its closest point; however, most of the range is in the open ocean. Landing propulsion noise would not be disturbing

on land, and sonic booms would not exceed 1 psf on land areas, as described in Appendix C, *Noise Report*.

3.2.4.2.1 Potential Noise Effects

This section discusses noise effects associated with the noise-generating activities that would become more frequent under the Proposed Action. Potential effects considered include activity interference, noise-compatible land use, structural damage potential, and hearing conservation. Associated noise effects from the Proposed Action would be expected to be of the same general type as the noise effects already evaluated for launch operations, ground support activities, and related site activities occurring throughout the Eastern Range. These effects are accounted for in the analysis presented in this section.

Airspace Closures

Airspace closures associated with the Proposed Action could result in temporarily grounded aircraft at affected airports and rerouting of en route flights on established alternate flight paths. Aircraft could be temporarily grounded if airspace above or around the airport is closed. Ground delays are also used under some circumstances to avoid airborne reroutes. If aircraft were grounded, noise levels at the airport could temporarily increase if the planes sit idle; some aircraft would likely shut down engines altogether until the closure has lifted. Also, depending on the altitude at which aircraft approach an airport, there could be temporary increases in noise levels in communities around the airports. Aircraft would travel on existing routes and flight paths that are used on a daily basis to account for weather and other temporary restrictions. Rerouting associated with launch-related closures represents a small fraction of the total amount of rerouting that occurs from all other reasons in any given year. Any incremental increases in noise levels at individual airports would only last the duration of the airspace closure on a periodic basis and are not expected to meaningfully change existing DNLs at the affected airports and surrounding areas. Therefore, airspace closures due the Proposed Action are not expected to result in significant noise effects.

Activity Interference

Noise generated by New Glenn launches as well as first- and second stage static fire tests has the potential to interfere with activities and would increase from up to 12 occurrences per year to up to 50 occurrences per year each. Noise generated by individual New Glenn operations would not change under the Proposed Action, but noise events with potential to interfere with activities would become more frequent. As described in Appendix C, *Noise Report*, section 3.1, New Glenn launch noise exceeds 85 dB $L_{A,max}$ (a level likely to interfere with activities) in the communities of Cape Canaveral and Cocoa Beach. Static fire test noise is directed away from neighboring communities as a result of SLC-36 flame trench configuration and does not exceed 85 dB $L_{A,max}$ in areas outside of CCSFS/KSC. Landing propulsion noise would occur offshore and would not be audible from land areas. New Glenn launches exceed 66 dBA, a noise level above which sentence intelligibility for people conversing at 3 feet apart drops below 95 percent, for between 0 and 145 seconds in communities neighboring CCSFS/KSC, (see section 3.2.4 of Appendix C, *Noise Report*). Static fire test noise lasts 30 seconds or less. In portions of Titusville, Merritt Island, the City of Cape Canaveral, and Cocoa Beach, late night launches (between 10:00 p.m. and 7:00 a.m.), which are assumed to make up 50 percent of total launches, would have the potential to awaken an estimated 4 percent of people. The potential for sleep

disturbance is discussed in greater detail in Appendix C, *Noise Report*, section 3.2.3. Figure 3.2-1 depicts example sonic boom footprints associated with potential launch and landing trajectories. Additional details, including the expected effects of varying atmospheric conditions on sonic boom overpressures, are discussed in Appendix C, *Noise Report*, section 4.1. Sonic booms generated by New Glenn launches and landings would be expected to exceed 1 psf—an overpressure likely to interfere with activities—over the Atlantic Ocean only.

Noise-Compatible Land Use

Propulsion noise generated by proposed New Glenn operations would be below 60 dB DNL in areas outside of CCSFS/KSC (Figure 3.2-2). At noise levels below 65 dB DNL, all land uses are considered compatible in accordance with DNL and FAA guidelines. New Glenn operations noise at locations off CCSFS/KSC would not have the potential to increase overall DNL by 1.5 dB when combined with baseline rocket operations noise (section 3.2.1 of Appendix C, *Noise Report*). Because the Proposed Action would not increase noise in a noise-sensitive area by 1.5 dB DNL or more, FAA significance criteria would not be exceeded.

As noted previously, sonic booms generated during New Glenn launch and landing operations would be focused in offshore areas within the potential landing platform range. New Glenn launch and landing sonic booms would not exceed 1 psf on land areas, and sonic boom time-averaged noise levels associated with these operations would be compatible with all land uses (i.e., below 60 dB CDNL) (see section 4.2 of Appendix C, *Noise Report*).

Structural Damage Potential

The probability of structural damage associated with individual New Glenn operations noise would not change, and the cumulative probability of damage associated with the proposed increased New Glenn operations would remain low.

New Glenn launches would continue to generate noise levels associated with a 1/1,000 probability of damage claims (i.e., 111 dB unweighted L_{max}) in the cities of Cape Canaveral and Cocoa Beach, as well as in portions of Merritt Island and the City of Cocoa. Noise levels associated with 1/100 probability of damage claims (i.e., 120 dB unweighted L_{max}) would continue to occur only within the boundaries of CCSFS/KSC (section 3.2.5 of Appendix C, *Noise Report*). Launch noise levels exceeding 130 dB L_{max} , which are associated with greater risk of damage, would continue to occur only on CCSFS within approximately 1.75 miles of SLC-36. There would continue to be minimal probability of damage at locations outside of CCSFS/KSC associated with New Glenn static fire noise levels. New Glenn launch and landing sonic booms would not exceed 1 psf on land and would therefore pose negligible risk to structures.

Hearing Conservation

As shown in Appendix C, *Noise Report*, section 3.2.2, New Glenn noise levels would continue to exceed 115 dB $L_{A,max}$ only within the boundaries of CCSFS. Hearing conservation programs in effect on CCSFS and KSC ensure that workers are not exposed to noise levels that would pose a risk to hearing without appropriate hearing protection. In the City of Cape Canaveral and in portions of Cocoa Beach and Merritt Island, New Glenn operations generate between 1 percent and 5 percent of the noise energy to which a person is permitted to be exposed per day according to OSHA regulations (i.e., the daily noise dose limit). Hearing loss risk associated with the Proposed Action would remain negligible.

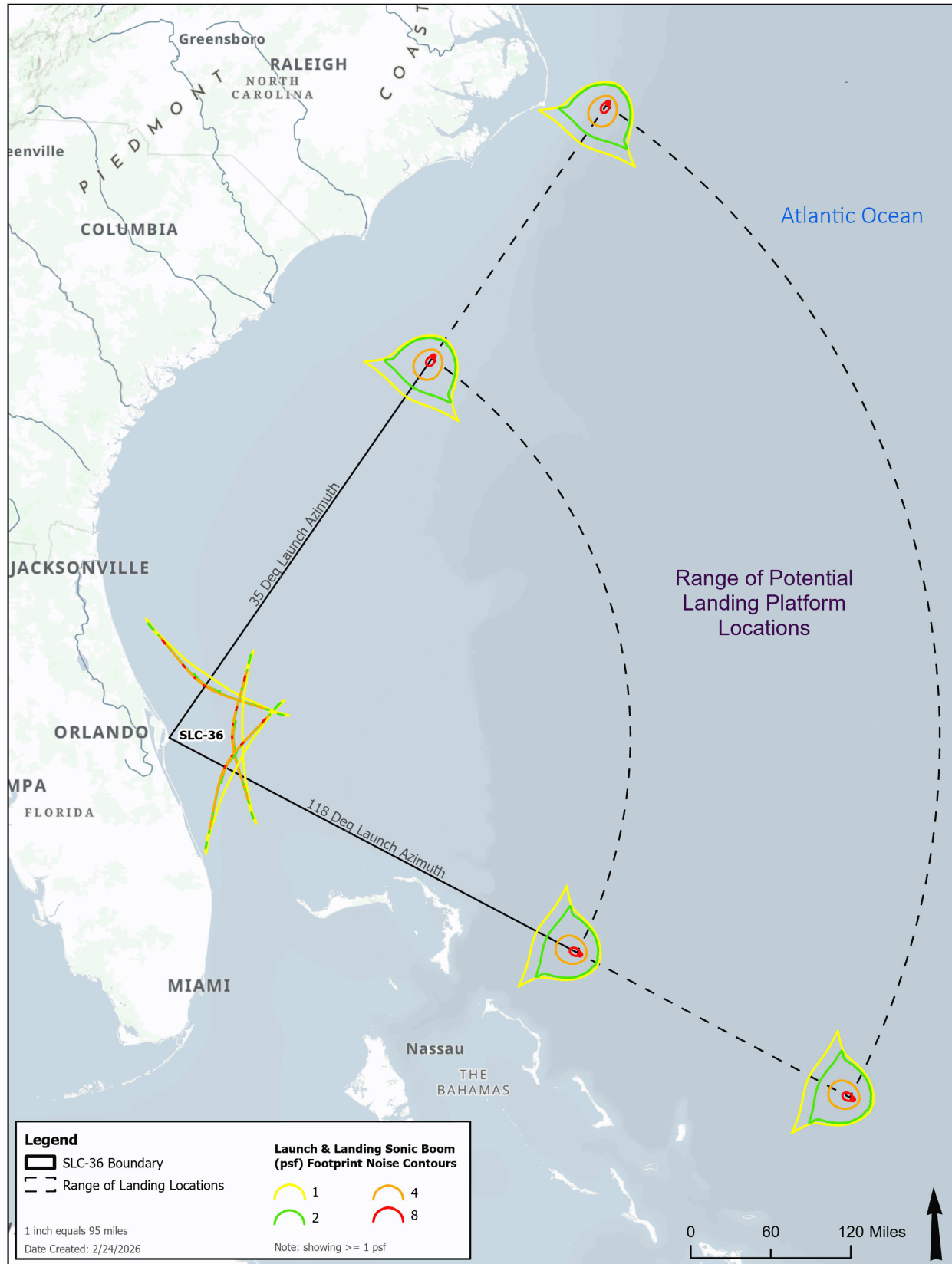


Figure 3.2-1. New Glenn Launch and Landing Potential Sonic Boom Footprints

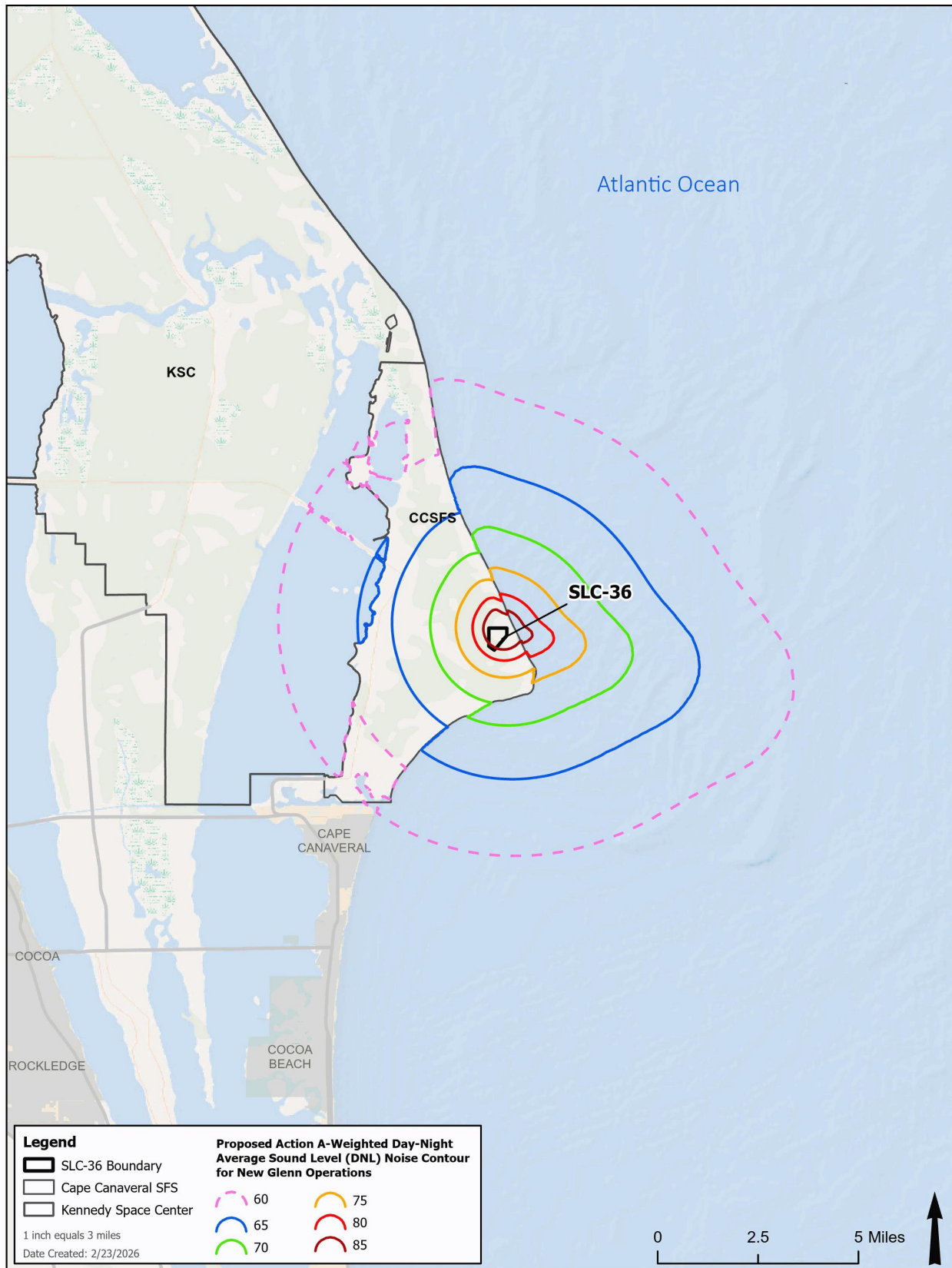


Figure 3.2-2. DNL for Blue Origin Operations

3.2.4.2.2 Effect Summary

The Proposed Action would increase the number of loud events per year but would not change the intensity of noise/overpressure associated with each event. Although the frequency of activity interference would increase, time-averaged noise levels generated by New Glenn operations would not exceed land use compatibility criteria and FAA noise significant effects criteria would not be exceeded. The risk of structural damage and hearing loss associated with New Glenn operations would remain low. FAA has not identified any reasonably foreseeable significant adverse noise effects as a result of the Proposed Action.

3.3 Biological Resources

3.3.1 Definition of Resource and Regulatory Setting

Biological resources include native vegetation, wildlife, and the habitats in which they occur. Protected species and invasive and nonnative species also are considered in this section. Key biological resources laws pertinent to the Proposed Action are the ESA, MSA, MMPA, BGEPA, and MBTA, which are summarized in section 1.6, *Permits, Approvals, and Agreements*.

3.3.2 Study Area

The study area includes locations where biological resources could be affected by noise (greater than 100 dB A-weighted sound exposure level [ASEL]), sonic booms (greater than 1 psf; offshore only), heat and exhaust plumes, vibration, items striking the water surface (e.g., fairings, debris), and vehicle and boat traffic. These areas generally include (1) terrestrial and nearshore habitats at and around SLC-36 affected by launches, static fire tests, and operations and (2) marine habitats in the ocean where boats would traverse, first stages and fairings would land and be recovered, and debris would land and be expected to sink. For a map of the study area and an explanation of how the study area was determined, see the USFWS *Biological and Conference Assessment for Blue Origin New Glenn Cadence Increase at SLC-36*, hereafter referred to as “SLC-36 USFWS BCA” in Appendix A.1, *Endangered Species Act Section 7 Consultation*.

3.3.3 Existing Conditions

Descriptions of biological resources within the study area are provided in several existing documents, including the *Space Launch Delta 45 (SLD 45) Integrated Natural Resources Management Plan (INRMP)* (DAF, 2025b), [Merritt Island National Wildlife Refuge \[MINWR\] Comprehensive Conservation Plan](#) (CCP) (USFWS, 2008a), and [Atlantic Fleet Training and Testing Environmental Impact Statement/Overseas Environmental Impact Statement](#) (DoN, 2018). Additional baseline information is available from the 2016 DAF EA and recent CCSFS and KSC commercial space NEPA documents and associated ESA consultation materials, which are in the appendices of each relevant EA/EIS (see Table 1.4-1).

Terrestrial Wildlife and Habitats

Habitats in and adjacent to SLC-36 generally consist of uplands (oak and rosemary scrub, palmetto scrub, hardwood hammocks, coastal strand, dune), wetlands (freshwater marsh, brackish marsh, cabbage palm hammock, wetland scrub-shrub), and disturbed areas composed of maintained and unmaintained ruderal vegetation. Invasive plant species are also present. The Banana River and Indian River provide large open areas of fresh and brackish water habitat.

Habitats on and near CCSFS support a great diversity of wildlife, including multiple at-risk species and hundreds of combined mammal, bird, reptile, and amphibian species. CCSFS is adjacent to the Indian River Lagoon, which is considered one of the most biologically diverse estuaries in North America (One Lagoon, 2019). Much of the land in adjacent KSC, Canaveral National Seashore, and MINWR is undeveloped and in a natural or semi-natural state. Wetlands are abundant on and near CCSFS.

Marine Wildlife and Habitats

Marine habitats consist of the entire water column, seafloor, and various structured habitats. The marine portion of the study area includes nearshore waters and offshore areas where first stage landing and fairing recovery operations would occur, and debris may land and sink. The nearshore and inner continental shelf offshore of CCSFS is composed mostly of sand and mud substrate interspersed with hardbottom areas that support invertebrate and fish communities.

Bottom habitats in the landing area (300 to 500 nautical miles from CCSFS) similarly consist primarily of soft sediments, with hardbottom habitat present in some areas. Coral reefs, marine critical habitats, and national marine sanctuaries are considered avoidance areas. Biotic habitats in the open ocean include floating macroalgae and invertebrate beds or structures. The ocean water column supports numerous species of marine mammals, sea turtles, fish, and invertebrates. Seabirds, which forage on or in the open ocean, may occur throughout the ocean landing area but are typically more abundant near ocean features that concentrate prey (e.g., upwelling zones).

Essential Fish Habitat

EFH and habitat areas of particular concern (HAPC), which are subsets of EFH that provide extremely important ecological functions or that are especially vulnerable to degradation, occur in marine areas near SLC-36 and in the landing area. Lemon and sandbar sharks, summer flounder, tilefish, snapper and grouper species, penaeid shrimp, dolphin and wahoo species, deep-water corals, and corals have HAPC within the study area. EFH for highly migratory species (e.g., billfish and sharks) is also present. EFH and HAPC in the study area consist primarily of the water column and most bottom habitats, including soft and coarse substrates, hard structure, vegetation, sponge communities, and floating Sargassum.

Federally Protected Species and Critical Habitat

This section covers species protected under the ESA and MMPA. The USFWS Information for Planning and Consultation (IPaC) system was queried on May 19, 2026, to obtain a list of the ESA-listed and proposed species under USFWS jurisdiction (see the SLC-36 USFWS BCA in Appendix A.1, *Endangered Species Act Section 7 Consultation*), as well as their proposed and designated critical habitat, that may occur within the study area (Table 3.3-1). SLD 45 sent the SLC-36 USFWS BCA (Appendix A.1) in September 2026 to the USFWS to initiate formal consultation. The BCA includes maps depicting key habitats and study area features (e.g., noise/sonic boom contours). The SLC-36 USFWS BCA determined that there would be no effect to designated or proposed critical habitat under USFWS jurisdiction so no maps depicting these areas are included in the EA.

**Table 3.3-1. ESA Species and Critical Habitat with Potential to Occur in Study Area
(USFWS Jurisdiction)**

Common Name (Scientific Name)	Federal Status	Launch and Static Fire Test Noise (ASEL 100 dB)	Atlantic Ocean Landing Area (includes 1 psf contours)
Birds			
Black-capped petrel (<i>Pterodroma hasitata</i>)	Endangered	-	X
Bermuda petrel (<i>Pterodroma cahow</i>)	Endangered	-	X
Crested caracara (<i>Caracara plancus audubonii</i>) [Florida DPS]	Threatened	X	-
Eastern black rail (<i>Laterallus jamaicensis jamaicensis</i>)	Threatened	X	-
Everglade snail kite (<i>Rostrhamus sociabilis plumbeus</i>)	Endangered	X	-
Florida scrub-jay (<i>Aphelocoma coerulescens</i>)	Threatened	X	-
Piping plover (<i>Charadrius melodus</i>)	Threatened	X	-
Roseate tern (<i>Sterna dougallii dougallii</i>)	Endangered	-	X
Rufa red knot (<i>Calidris canutus rufa</i>)	Threatened	X	-
Insects			
Monarch butterfly (<i>Danaus plexippus</i>)	Proposed Threatened	X	-
Mammals			
Southeastern beach mouse (<i>Peromyscus polionotus niveiventris</i>)	Threatened	X	-
Tricolored bat (<i>Perimyotis sublavus</i>)	Proposed Endangered	X	-
West Indian manatee (<i>Trichechus manatus</i>)	Threatened, MMPA	X	-
Plants			
Carter's mustard (<i>Warea carteri</i>)	Endangered	X	-
Lewton's polygala (<i>Polygala lewtonii</i>)	Endangered	X	-
Reptiles			
Eastern indigo snake (<i>Drymarchon couperi</i>)	Threatened	X	-
Green sea turtle (<i>Chelonia mydas</i>) [North Atlantic Ocean DPS] ¹	Threatened	X	-
Hawksbill sea turtle (<i>Eretmochelys imbricata</i>) ¹	Endangered	X	-
Kemp's ridley sea turtle (<i>Lepidochelys kempii</i>) ¹	Endangered	X	-
Leatherback sea turtle (<i>Dermochelys coriacea</i>) ¹	Endangered	X	-

Table 3.3-1. ESA Species and Critical Habitat with Potential to Occur in Study Area (USFWS Jurisdiction)

Common Name (Scientific Name)	Federal Status	Launch and Static Fire Test Noise (ASEL 100 dB)	Atlantic Ocean Landing Area (includes 1 psf contours)
Loggerhead sea turtle (<i>Caretta caretta</i>) [Northwest Atlantic Ocean DPS] ¹	Threatened	X	-
Critical Habitat			
Rufa red knot	Proposed	X	-
West Indian manatee	Final and Proposed	X	-
Green sea turtle ¹	Proposed	X	-
Loggerhead sea turtle ¹	Final	X	-

Notes: - = not listed in IPaC report for this area (either not anticipated to occur or not under USFWS jurisdiction in this area); ASEL = A-weighted sound exposure level; BCA = Biological and Conference Assessment; DPS = distinct population segment; ESA = Endangered Species Act; IPaC = Information for Planning and Consultation; MMPA = Marine Mammal Protection Act; NMFS = National Marine Fisheries Service; SLC = Space Launch Complex; USFWS = United States Fish and Wildlife Service.

¹ Sea turtles and designated and proposed critical habitat within the Atlantic Ocean are covered in the NMFS Programmatic Letter of Concurrence (Appendix A.1.2).

Source: See Appendix A, Information for Planning and Consultation (IPaC) Reports, of the SLC-36 USFWS BCA in Appendix A.1, *Endangered Species Act Section 7 Consultation*.

For additional information on the federally protected species listed in Table 3.3-1, see the SLC-36 USFWS BCA in Appendix A.1, *Endangered Species Act Section 7 Consultation*, as well as the KSC Environmental Resources Document (ERD) (NASA, 2020), SLD 45 INRMP (DAF, 2025b), and MINWR CCP (USFWS, 2008a).

All marine mammal species are protected under the MMPA; several species are protected under the ESA as well. Table 3.3-2 identifies ESA-listed species under NMFS jurisdiction, as well as their proposed and designated critical habitat, with potential occurrence in the study area. Additional information on the marine mammals and ESA species potentially found within the study area is provided in the 2016 DAF EA (DAF, 2016), 2026 NMFS PLOC (Appendix A.1, *Endangered Species Act Section 7 Consultation*), KSC ERD (NASA, 2020), SLD 45 INRMP (DAF, 2025b), NMFS stock assessment reports (Carretta et al., 2023; Hayes et al., 2023), and Atlantic Fleet Training and Testing Supplemental EIS/Overseas EIS (DoN, 2025).

Table 3.3-2. ESA Species and Critical Habitat with Potential to Occur in Study Area (NMFS Jurisdiction)

Common Name (Scientific Name)	Distinct Population Segment	Federal Status	Launch and Static Fire Test Noise (ASEL 100 dB)	Atlantic Ocean Landing Area (includes 1 psf contours)
Fishes				
Atlantic sturgeon (<i>Acipenser oxyrinchus oxyrinchus</i>)	South Atlantic	Endangered	X	X
Atlantic sturgeon (<i>Acipenser oxyrinchus oxyrinchus</i>)	Carolina, Chesapeake Bay, New York Bight	Endangered	-	X

**Table 3.3-2. ESA Species and Critical Habitat with Potential to Occur in Study Area
(NMFS Jurisdiction)**

Common Name (Scientific Name)	Distinct Population Segment	Federal Status	Launch and Static Fire Test Noise (ASEL 100 dB)	Atlantic Ocean Landing Area (includes 1 psf contours)
Giant manta ray (<i>Manta birostris</i>)	-	Threatened	X	X
Nassau grouper (<i>Epinephelus striatus</i>)	-	Threatened	X	X
Oceanic whitetip shark (<i>Carcharhinus longimanus</i>)	-	Threatened	-	X
Scalloped hammerhead shark (<i>Sphyrna lewini</i>)	Central and Southwest Atlantic	Threatened	-	X
Shortnose sturgeon (<i>Acipenser brevirostrum</i>)	-	Endangered	-	X
Smalltooth sawfish (<i>Pristis pectinata</i>)	-	Endangered	X	X
Sea Turtles				
Green sea turtle (<i>Chelonia mydas</i>)	North Atlantic	Threatened	X	X
Hawksbill sea turtle (<i>Eretmochelys imbricata</i>)	-	Endangered	X	X
Kemp's ridley sea turtle (<i>Lepidochelys kempii</i>)	-	Endangered	X	X
Leatherback sea turtle (<i>Demochelys coriacea</i>)	-	Endangered	X	X
Loggerhead sea turtle (<i>Caretta caretta</i>)	Northwest Atlantic	Threatened	X	X
Marine Mammals (species additionally protected under the MMPA)				
Blue whale/pygmy blue whale (<i>Balaenoptera musculus</i>)	-	Endangered	-	X
Fin whale (<i>Balaenoptera physalus</i>)	-	Endangered	-	X
North Atlantic right whale (<i>Eubalaena glacialis</i>)	-	Endangered	X	X
Sei whale (<i>Balaenoptera borealis</i>)	-	Endangered	-	X
Sperm whale (<i>Physeter macrocephalus</i>)	-	Endangered	-	X
Invertebrates				
Boulder star coral (<i>Orbicella franksi</i>)	-	Threatened	-	X
Elkhorn coral (<i>Acropora palmata</i>)	-	Threatened	-	X
Lobed star coral (<i>Orbicella annularis</i>)	-	Threatened	-	X
Mountainous star coral (<i>Orbicella faveolata</i>)	-	Threatened	-	X
Pillar coral (<i>Dendrogyra cylindrus</i>)	-	Endangered	-	X
Rough cactus coral (<i>Mycetophyllia ferox</i>)	-	Threatened	-	X
Staghorn coral (<i>Acropora cervicornis</i>)	-	Threatened	-	X
Queen conch (<i>Aliger gigas</i>)	-	Threatened	-	X

Table 3.3-2. ESA Species and Critical Habitat with Potential to Occur in Study Area (NMFS Jurisdiction)

Common Name (Scientific Name)	Distinct Population Segment	Federal Status	Launch and Static Fire Test Noise (ASEL 100 dB)	Atlantic Ocean Landing Area (includes 1 psf contours)
Critical Habitat				
Green sea turtle (Reproductive, Migratory, and Benthic Foraging/Resting; Surface-Pelagic Foraging/Resting)	-	Proposed	X	X
Loggerhead sea turtle (Sargassum, Constricted Migratory, Breeding, Nearshore Reproductive)	-	Final	X	X
North Atlantic right whale	-	Final	X	X

Notes: - = not applicable; ASEL = A-weighted sound exposure level; dB = decibel(s); ESA = Endangered Species Act; LOC = Letter of Concurrence; MMPA = Marine Mammal Protection Act; NMFS = National Marine Fisheries Service.

Source: NMFS Programmatic Letter of Concurrence (Appendix A.1.2)

Migratory Birds and Bald Eagles

The term *migratory birds* includes almost all wild native birds found in the United States excluding resident game birds and nonnative species. The study area is situated along the Atlantic Flyway for migratory birds and thus supports a wide variety of migratory birds. The bald eagle and various songbirds, shorebirds, wading birds, and other types of migratory birds utilize the wetland, shoreline, and upland habitats within the study area for foraging, nesting, and roosting. The study area supports multiple species of terns, sparrows, petrels, warblers, herons, egrets, plovers, woodpeckers, and other bird species; see the MINWR Bird List (USFWS, 2019), KSC ERD (NASA, 2020), and SLD 45 INRMP (DAF, 2025b) for listings of the bird species that have been documented at MINWR, KSC, and CCSFS.

Reports run in the IPaC tool for the biological study area identified 41 migratory bird species that may warrant special attention, four of which are Birds of Conservation Concern (see IPaC appendix of the SLC-36 USFWS BCA in Appendix A.1, *Endangered Species Act Section 7 Consultation*). Most of these species occur within Bird Conservation Region 31 (Peninsular Florida), with a few in Marine Bird Conservation Region M19 (Southeast U.S. Continental Shelf and U.S. waters [M16] beyond the shelf). The *Birds of Conservation Concern 2021, Migratory Bird Program* report provides a map and full list of the Birds of Conservation Concern within these regions (USFWS, 2021).

State-Protected Species

Inquiries of the internet-based Florida Natural Areas Inventory Searchable Field Guides and Tracking List yielded a total of 24 state-listed animal species that may occur in Brevard County, which is where land-based effects may occur. State-protected plant and animal species potentially found at KSC, MINWR, and CCSFS are listed in the KSC ERD (NASA, 2020), SLD 45 INRMP (DAF, 2025b), and MINWR CCP (USFWS, 2008a). The Florida Fish and Wildlife Conservation Commission Imperiled Species website (<https://myfwc.com/wildlifehabitats/wildlife/>) provides species profiles for imperiled fish and wildlife species in Florida. The Florida

Natural Areas Inventory website for Florida Rare Species Field Guides (<https://www.fnai.org/species-communities/species-guides/field-guides-main>) includes rare plant and animal species descriptions and habitat information.

3.3.4 Environmental Consequences

Analysis Methodology

Under FAA's significance threshold, effects to biological resources would be significant if the USFWS or NMFS determines that the action would be likely to jeopardize the continued existence of a federally listed threatened or endangered species, or would result in the destruction or adverse modification of federally designated critical habitat (FAA, 2023). FAA has not established a significance threshold for non-listed species but has identified additional factors to consider when evaluating the context and intensity of potential effects (FAA, 2023), including whether the action may cause any of the following: (1) long-term or permanent loss of unlisted plant or wildlife species; (2) adverse effects to special status species or their habitats; (3) substantial loss, reduction, degradation, disturbance, or fragmentation of native species' habitats or their populations; or (4) adverse effects on a species' reproductive success rates, natural mortality rates, nonnatural mortality, or ability to sustain the minimum population levels required for population maintenance.

3.3.4.1 No Action

Under the No Action Alternative, there would be no change in New Glenn operations at SLC-36 or relative changes to biological resources effects within the affected environment. FAA has identified no additional reasonably foreseeable effects to biological resources associated with continued New Glenn operations.

3.3.4.2 Proposed Action

This section analyzes reasonably foreseeable effects to biological resources from an increase in launches from up to 12 per year to up to 50 per year at SLC-36, as well as associated static fire tests, landings and fairing recoveries in the Atlantic Ocean, and debris landing in the open ocean and subsequently sinking. Analyses from the prior EAs/EISs listed in Table 1.4-1 are incorporated by reference; the subsections below summarize applicable conclusions and focus on aspects specific to the Proposed Action.

3.3.4.2.1 Stressors Associated with the Proposed Action

Direct or indirect modifications to the land, water, or air caused by an action are identified as stressors. Table 3.3-3 identifies the potential stressors from the Proposed Action with reasonably foreseeable effects to biological resources.

Table 3.3-3. Stressors Associated with the Proposed Action

Stressor	Description
Noise, Sonic Booms, and Visual Stimuli	Animals are expected to exhibit a wide variety of responses to noise, sonic booms (marine species only), and visual stimuli, with the degree of disturbance influenced by the type of noise generated, proximity to the noise source, duration of the sound, frequency of events, co-occurrence with other stressors, and the history of exposure. Noise effects on wildlife are classified as direct (e.g., masking, physiological changes to the auditory system), nonauditory (e.g., stress, hypertension, behavioral changes,

Table 3.3-3. Stressors Associated with the Proposed Action

Stressor	Description
	interference with reproduction, feeding, sheltering), or the result of other effects (e.g., population decline). Sonic booms may also reduce foraging efficiency and feeding time, interrupt communication, interfere with predator/prey detection, and cause animals to avoid the area.
Vibrations	Factors that may affect an animal's reaction to vibrations include the duration of the activity, proximity to the activity, frequency of previous exposures, and what other stressors occur simultaneously.
Strikes/Collisions	Strikes by equipment, vehicles, boats, landing platforms, debris, and the launch vehicle are possible, potentially injuring or killing wildlife.
Entanglement/Ingestion	If encountered, parachute material and lines may limit an animal's ability to move through the water for feeding, reproductive, or migratory purposes or hinder its ability to escape predation. Ingested and entangled materials may cut into tissues, enable infection, and severely compromise an individual's health, including death.
Artificial Lighting	At night, artificial lighting has the potential to disorient or disturb animals, including temporary or permanent abandonment of nesting, roosting, and foraging areas. Some species may suffer from increased predation due to this lighting, while others may more easily locate their prey. Tower lighting may disorient birds and bats, causing them to circle the lights to exhaustion or to fly into the lights. Artificial lighting may disturb nesting sea turtles, and newly hatched sea turtles may mistakenly crawl landward toward the lights instead of to the sea.
Deluge Water, Plume Heat and Vapor	Vegetation and animals caught within the deluge water or plumes may be injured or killed. Vegetation within SLC-36 may be blow down or flattened by deluge water.
Hazardous Materials	An accidental release of hazardous materials could expose individual animals to contaminants, potentially resulting in injury, sickness, or death. Required hazardous materials management procedures would minimize the occurrence and extent of accidental releases. Because the engines of the New Glenn use liquid oxygen, liquefied natural gas, and liquid hydrogen, plants and animals would not be exposed to contaminants in the vapor cloud. Launch vehicles are designed to retain propellants and even if there is a rare launch failure, propellants would evaporate and be diluted within hours.
Restricted Access for Management and Monitoring	Launch-related closures limit access for natural resources management (e.g., prescribed burning, species monitoring) in certain areas on a periodic basis, potentially affecting the health of certain species and their habitats. The 2025 <i>Memorandum of Understanding for Prescribed Burning</i> (SLD 45, USFWS, and KSC, 2025) included procedures to minimize such conflicts for burning.

Note: SLC = Space Launch Complex.

3.3.4.2.2 Terrestrial Wildlife and Habitats

Terrestrial wildlife and habitats would be increasingly exposed to the stressors identified in Table 3.3-3 (e.g., noise, vibrations) under the Proposed Action, with up to an additional 76 static fire tests, 38 launches, and 38 landings in the Atlantic Ocean landing area annually compared to the No Action Alternative. Potential effects on terrestrial biological resources from space operations at CCSFS and KSC have been previously analyzed in the NEPA documents in Table 1.4-1 and ESA USFWS consultations for Falcon 9 and Starship-Super Heavy and are generally applicable to non-listed terrestrial species and habitats (USFWS, 2025a; USFWS, 2025b; USFWS, 2025c). In addition, the SLC-36 USFWS BCA (Appendix A.1, *Endangered Species Act Section 7 Consultation*) evaluates the potential effects of increased Blue Origin New Glenn launches at SLC-36 on species and critical habitats protected and proposed for protection under the ESA. The

same stressors and effects described in these documents are generally applicable to non-listed terrestrial species and habitats; a summary of applicable effect conclusions is provided below.

The potential for terrestrial animals to be injured or killed due to vehicle and equipment strikes at SLC-36 and on roads would increase under the Proposed Action due to the increased vehicular traffic. The collision risk for manatees and other aquatic species from boats and the landing platform would also increase but would be minimized by required low speed limits and other measures described in the SLC-36 USFWS BCA in Appendix A.1, *Endangered Species Act Section 7 Consultation*. Localized damage to vegetation within the SLC-36 pad boundary may result from deluge water, vapor clouds, and heat plumes, as well injury or death of animals that did not vacate the area prior to the static fire test or launch. Effects to aquatic habitats from deluge water, vapor clouds, and heat plumes would not be expected due to the implementation of permit requirements and containment of deluge water within SLC-36. Under the Proposed Action, species and habitats within a mile of the SLC-36 launch pad would be exposed to noise levels between 125 dB ASEL and 130 dB ASEL from up to an additional 38 launches and 76 static fire tests annually, with noise levels in excess of 100 dB ASEL extending out approximately 9 miles in all directions from the launch pad. All landings and sonic booms would occur in the Atlantic Ocean and would not affect terrestrial biological resources. As discussed in Table 3.3-3 and the SLC-36 USFWS BCA, behavioral and stress reactions to noise, vibrations, and visual disturbances would be expected in some animals, and some individuals may avoid areas during periods of disturbance, which could affect health and reproductive success. Species reactions would vary depending on the frequency of exposure and proximity to the activity, with more intense reactions expected during initial exposures and at higher exposure levels. For some individuals, the degree of response may lessen over time with repeated exposure, while others may permanently avoid areas with increased noise and vibrations. Compared with the baseline level of approved operations at CCSFS and KSC (see section 3.1, *Introduction*) and the magnitude of noise from some of the other launch vehicles (140 dB ASEL to 150 dB ASEL), the effects to biological resources from additional New Glenn operations would be relatively minor.

Due to the increased launch tempo under the Proposed Action, there would be an increase in the overall incidence of artificial light, as safety and security lighting is required for multiple days/nights for each launch event and up to 50 percent of launches and static fire tests would occur at night. There also would be brief, intense lighting from additional nighttime static fire tests and nighttime launches. Such lighting may disorient birds and affect the behavior of nesting and hatchling sea turtles, bats, southeastern beach mice, and other animals. Each facility at CCSFS and KSC is required to develop and follow a lighting management plan. Exterior lighting measures have been identified previously in the CCSFS INRMP (DAF, 2025b), SLD 45 Instruction 32-7001 (*Exterior Lighting Management*), and a 2008 Biological Opinion that addressed lighting effects at CCSFS (USFWS, 2008b). To minimize negative effects to wildlife, Blue Origin would update the existing lighting management plan for SLC-36 and implement measures in the plan to decrease lighting effects to the extent possible (e.g., sea turtle friendly lighting, light shields). Continued sea turtle monitoring conducted by SLD 45 would help detect any lighting effects.

Launch-related closures would increase under the Proposed Action, potentially limiting access for natural resources management activities (e.g., prescribed burning) and monitoring. Due to the removal of certain burn restrictions in the 2025 *Memorandum of Understanding for Prescribed Burning* (SLD 45, USFWS, and KSC, 2025), increased New Glenn operations are not anticipated to impede burning. However, if additional closures limit other necessary natural resources management activities (e.g., feral hog control) or prevent required species monitoring, some species may be negatively affected (e.g., habitat degradation, sea turtle desiccation due to disorientation). Continued monitoring by SLD 45 is also needed to assess long-term effects and adapt activities accordingly.

In summary, the increased number of New Glenn operations may result in additional behavioral disturbance and (in limited cases) injury or mortality associated with more frequent noise, vibrations, lighting, strikes, deluge water, and plumes. The Proposed Action would not exceed the FAA significance threshold because it would not result in any species extirpations, substantial habitat effects, or adverse population-level effects. Therefore, FAA has not identified any reasonably foreseeable significant adverse effects to terrestrial wildlife and habitats as a result of the Proposed Action.

3.3.4.2.3 Marine Wildlife and Habitats

Potential effects on marine biological resources from space operations have been analyzed in the NEPA documents listed in Table 1.4-1 and the PLOC issued by NMFS (Appendix A.1.2, *National Marine Fisheries Service Programmatic Letter of Concurrence*). The stressors and effects described in these documents are generally applicable to non-listed marine species and habitats; a summary of the applicable effect conclusions is provided below.

Although the total number of marine animals potentially exposed to the stressors in Table 3.3-3 (e.g., noise, sonic booms) would increase under the Proposed Action, the potential for exposure would remain low overall due to the low density of animals at the surface in offshore waters. Noise and sonic booms do not propagate well through the water's surface, so their effects on marine species would be limited primarily to individuals at or near the surface. The probability is low that a marine animal would surface exactly when a sonic boom or potentially disturbing noise levels reached the water's surface.

The increased number of landings would increase the potential for vessel strikes. However, such events would remain unlikely due to the disperse distribution of marine animals in the study area. Additionally, Blue Origin would implement required project design criteria (PDC) (e.g., speed restrictions, protected species observers) from the 2026 NMFS PLOC that would minimize the potential for strikes.

Given NMFS' concurrence in the 2026 NMFS PLOC with the determination of may affect, not likely to adversely affect, for federally listed species and critical habitats, FAA is making the determination that the Proposed Action would not result in long-term loss of marine species, substantial loss or degradation of marine habitats, or adverse effects on any species' reproductive success, mortality rates, or ability to sustain minimum population levels. Thus, FAA has not identified any reasonably foreseeable significant adverse effects to marine wildlife or habitats as a result of the Proposed Action.

3.3.4.2.4 *Essential Fish Habitat*

Some of the first stage landing locations off the coast of North Carolina are within EFH for coastal migratory pelagics, spiny lobster, snapper grouper, shrimp, and dolphin wahoo. In this location, there could be the potential for effects on marine species and EFH from payload fairing debris falling into the ocean. Structural debris, if not recovered, is expected to sink rapidly to the bottom where it may settle on hard and soft substrates that function as EFH. Likewise, parachutes, parafoils, and other debris are expected to sink if they are not recovered. The area affected would be small relative to available habitat and the amount of materials (e.g., metals and composites) that could leach or dissolve into the water column or substrate after the vehicle debris sinks to the ocean floor would be minimal and would not result in detectable changes to water or sediment quality. Additionally, the probability of debris affecting EFH would be considered negligible given the plans to land the vehicle on the at-sea platform and recover the payload fairings. Blue Origin would notify NMFS of any unplanned debris or releases into the ocean so that the agency could assess whether additional measures are required to protect marine resources. In summary, the Proposed Action would not adversely affect EFH or measurably reduce the quantity of EFH for managed fisheries. FAA has not identified any reasonably foreseeable significant adverse effects to EFH as a result of the Proposed Action.

3.3.4.2.5 *Federally Protected Species and Critical Habitat*

In the SLC-36 BCA submitted to the USFWS in September 2026 to initiate ESA Section 7 consultation, potential effects on ESA-listed species and critical habitat were analyzed for the following stressors associated with the Proposed Action: noise, sonic booms, visual stimuli, vibrations, strikes/collisions, deluge water, plume heat and vapor, artificial lighting, hazardous materials, and restricted access for management and monitoring. Conservation measures to avoid and minimize effects to listed species (e.g., education, lighting plan, monitoring) were considered as part of the analyses. The DAF determined that the Proposed Action may affect, but is not likely to adversely affect, the Audubon's crested caracara, Bermuda petrel, black-capped petrel, Eastern black rail, Everglade snail kite, piping plover, roseate tern, rufa red knot, southeastern beach mouse, or West Indian manatee, and is not expected to jeopardize the continued existence of two species proposed for listing under the ESA—the monarch butterfly and tricolored bat. The DAF also determined that the Proposed Action may affect and is likely to adversely affect the Florida scrub-jay, Eastern indigo snake, green sea turtle, hawksbill sea turtle, Kemp's ridley sea turtle, leatherback sea turtle, and loggerhead sea turtle (Appendix A.1, *Endangered Species Act Section 7 Consultation*). The primary stressor of concern for scrub-jays and indigo snakes is vehicle strikes on roads, while artificial light is the main stressor analyzed for sea turtles.

On July 29, 2025, FAA, the DAF, and NASA reinitiated ESA Section 7 consultation with NMFS to expand the current scope of the PLOC for Space Launch and Reentry Operations. Potential effects on NMFS ESA-listed species and critical habitat were analyzed for the following stressors: direct impact by falling objects, entanglement, unrecovered debris, pollution, in-air sound, impulsive underwater sound, noise and visual disturbance, vessel strike, increases sea surface temperature, and vibration from launches. On May 4, 2026, NMFS issued a PLOC,

concurring that, with implementation of PDC, space launch and reentry operations may affect, but are not likely to adversely affect, ESA-listed species and critical habitats under NMFS jurisdiction (Appendix A.1.2, *National Marine Fisheries Service Programmatic Letter of Concurrence*). The PDC are intended to avoid or reduce the severity of the effects on ESA-listed species and their critical habitat (e.g., measures for observation/education, reporting, vessel operations, aircraft procedures, hazardous materials response). Blue Origin's proposed New Glenn launch operations are within the scope of the PLOC. See the SLC-36 USFWS BCA and NMFS PLOC in Appendix A.1, *Endangered Species Act Section 7 Consultation*, for additional information and effect analyses on the species and critical habitats listed in Table 3.3-1 and Table 3.3-2, respectively.

Blue Origin and SLD 45 will follow the terms and conditions, conservation measures, PDC, and other requirements listed in the NMFS PLOC Appendix A.1, *Endangered Species Act Section 7 Consultation*) and any USFWS SLC-36 Biological and Conference Opinion resulting from ESA Section 7 consultation. With the implementation of these requirements, it is unlikely that the Proposed Action would jeopardize the continued existence of any ESA-listed threatened or endangered species or result in the destruction or adverse modification of federally designated critical habitat for any species, and the Proposed Action would not substantially affect marine mammal populations or stocks. Thus, FAA has not identified any reasonably foreseeable significant adverse effects to federally listed species or critical habitat as a result of the Proposed Action. The Final EA will document the findings and conclusion of the ESA consultation with the USFWS.

3.3.4.2.6 Migratory Birds and Eagles

Migratory birds may occur at the site at any time of year but are more likely to be seen during the spring and fall migration periods. The stressors and potential effects associated with the Proposed Action described in Table 3.3-3, and the SLC-36 USFWS BCA in Appendix A.1, *Endangered Species Act Section 7 Consultation*, would generally apply to migratory birds and bald eagles as well (e.g., behavioral changes, injury, death, or habitat modification due to noise, visual stimuli, lighting, vibrations, deluge water/plumes, strikes, collisions). In particular, migratory birds may be attracted to artificial lighting at night and become disoriented and fatigued. Thus, the increased number of nights with the safety and security lighting for launch events may increase the instances of migratory bird disorientation.

Of particular concern for operations activities with respect to eagles and migratory birds is the potential for take associated with effects to nests or eggs. Currently, there are 10 shorebird/seabird sites located within the 125 dB ASEL contour, which extends approximately 1.5 miles from the launch pad (Figure 3.3-1). The closest wading bird rookery and eagle nest are approximately 4 miles to the west and 4.5 miles to the southwest of the SLC-36 launch pad, respectively, which are within the 110 dB ASEL contour (Figure 3.3-1). If a bald eagle or migratory bird were to establish a nest in a location that would interfere with operations and require removal, then Blue Origin would notify SLD 45 personnel to coordinate SLD 45 removal or acquisition of the appropriate permits.

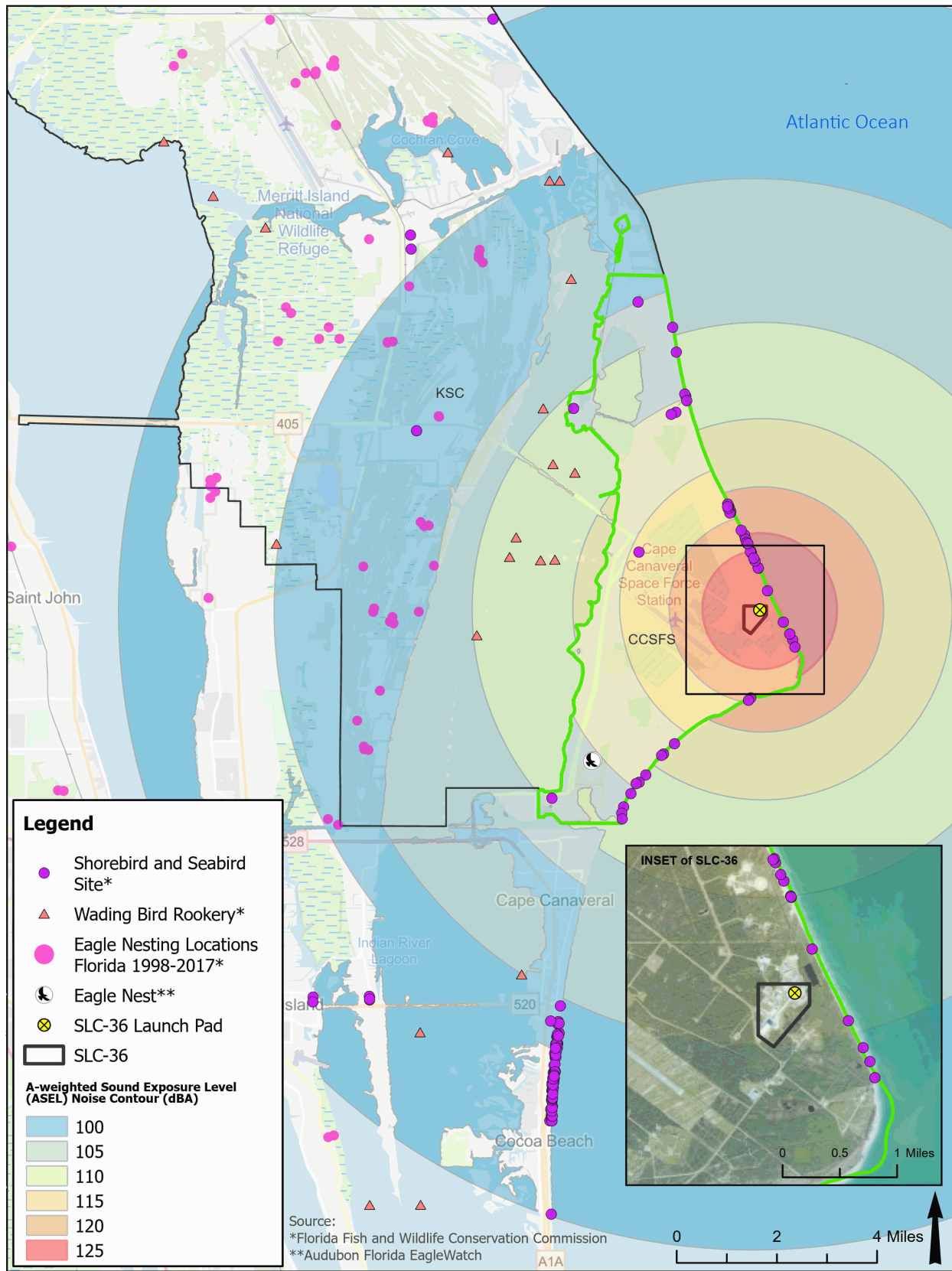


Figure 3.3-1. Bald Eagle Nesting Locations, Wading Bird Rookeries, and Shorebird and Seabird Sites

Migratory birds and eagles may alter behaviors, be injured or die, or have their habitats altered due to operations-related noise, visual stimuli, vibrations, deluge water/plumes, lighting, strikes, and collisions. However, SLC-36 is already an active launch complex and permits would be obtained if nest removal by Blue Origin was deemed necessary. The Proposed Action would not result in any species extirpations, substantial habitat effects, or adverse population-level effects. Thus, FAA has not identified any reasonably foreseeable significant adverse effects to eagles and other migratory bird species as a result of the Proposed Action.

3.3.4.2.7 State-Protected Species

The stressors and potential effects associated with operations described in Table 3.3-3 and the SLC-36 USFWS BCA in Appendix A.1, *Endangered Species Act Section 7 Consultation*, would generally apply to state-protected species as well; see these resources for detailed analyses of potential effects from operations.

Although individuals of some state-listed species may alter behaviors, be injured or killed, or have their habitats altered due to operations noise, visual stimuli, vibrations, deluge water, plumes, lighting, strikes, and collisions, the Proposed Action would not result in any species extirpations, substantial habitat effects, or adverse population-level effects. As a result, FAA has not identified any reasonably foreseeable significant adverse effects to state-protected species as a result of the Proposed Action.

3.4 Historical, Architectural, Archaeological, and Cultural Resources

3.4.1 Definition of Resource and Regulatory Setting

Historical, architectural, archaeological, and cultural resources (referred to generally as cultural resources) consist of prehistoric and historic districts, sites, buildings, structures, objects, artifacts, and any other physical evidence of human activity considered important to a culture or community. This section describes aboveground historic buildings, structures, and districts; National Historic Landmarks; archaeological resources; and Native American cultural properties.

This action is subject to Section 106 of the NHPA of 1966. The DAF is acting as the lead federal agency for compliance with Section 106 of the NHPA. Regulations and requirements related to cultural resources include the NHPA (54 U.S.C. §§300101 et seq.); DAF Manual 32-7003, *Environmental Conservation*; and DAF Instruction 90-2002, *Interactions with Federally Recognized Tribes*.

3.4.2 Study Area

An Area of Potential Effects (APE) is the geographic area where an undertaking may directly or indirectly cause alterations in the character or use of historic properties (36 CFR §800.16(d)). The APE considers any physical, visual, or auditory effects that the undertaking may have on historic properties as defined in 36 CFR §800.16(l)(1). After historic properties within the APE are identified and evaluated, effects evaluations are completed to determine whether the proposed project could affect historic properties. For NHPA/NEPA planning, recent launch analyses use a conservative screening metric to define the operational APE for potential “launch effects” on

historic properties, which is a 130 dB (unweighted) $L_{\max}$ threshold (Figure 3.4-1). This threshold is cited as a conservative indicator for the potential for structural damage when sound levels exceed 130 dB (unweighted) for more than 1 second (National Academy of Sciences, 1977), and it is used to bound the geographic area where such effects could plausibly occur and where additional consideration under Section 106 may be warranted.

3.4.3 Existing Conditions

Cultural resources within the APE were identified and analyzed by reviewing data from the Florida Master Site File, the SLD 45 *Integrated Cultural Resource Management Plan* (DAF, 2025c), and aerial photographs. Information on cultural resources in the study area is also available in the 2016 DAF EA (DAF, 2016), *SpaceX Falcon 9 Operations at SLC-40 CCSFS EA* (FAA, 2025), and *Starship-Super Heavy CCSFS EIS* (DAF, 2025a). Resource descriptions in these documents are incorporated by reference and summarized in the following subsections. Resource review shows that nearly, if not all, historic resources have been surveyed or evaluated by SLD 45. The operations area does not encompass any National Register of Historic Places (NRHP) districts (DAF, 2025a). There are no World Heritage List sites within the operations area APE (DAF, 2025a).

Historic property review within the APE indicates there are seven individually eligible historic structures, six eligible resource groups, 30 resources that are eligible as contributing to a resource group, and 25 eligible or unevaluated archaeological sites within the APE. Of the 25 archaeological sites or districts within the APE, 13 are noted as NRHP eligible and the remaining 12 are unevaluated. SLD 45 finds that the review and consultation process, in part described above, meets the reasonable and good faith effort outlined at 36 CFR §800.4(b)(1) and expanded on in the Advisory Council on Historic Preservation's (ACHP's) meeting the "Reasonable and Good Faith" identification standard in Section 106 review. Appendix A.2, *National Historic Preservation Act (NHPA)*, presents a list of individual properties, historic districts, and archaeological sites, as well as NHPA Section 106 consultation documentation.

3.4.4 Environmental Consequences

The process for evaluating effects on historic properties is governed by 36 CFR §800.4. FAA has not established a significance threshold for this effect category; however, FAA has identified a factor to consider when evaluating the context and intensity of potential environmental effects for historical, architectural, archaeological, and cultural resources. This factor includes, but is not limited to, situations in which the proposed action or alternative(s) would result in a finding of adverse effect through the Section 106 process (FAA, 2023). This factor is not intended to be a threshold, because an effect that is adverse under Section 106 is not necessarily significant under NEPA. The Section 106 consultation process and advice from the ACHP and SHPO/Tribal Historic Preservation Officer may assist FAA in making this determination. Resolution of adverse effects under 36 CFR §800.6 may be sufficient to avoid significance (FAA, 2023).

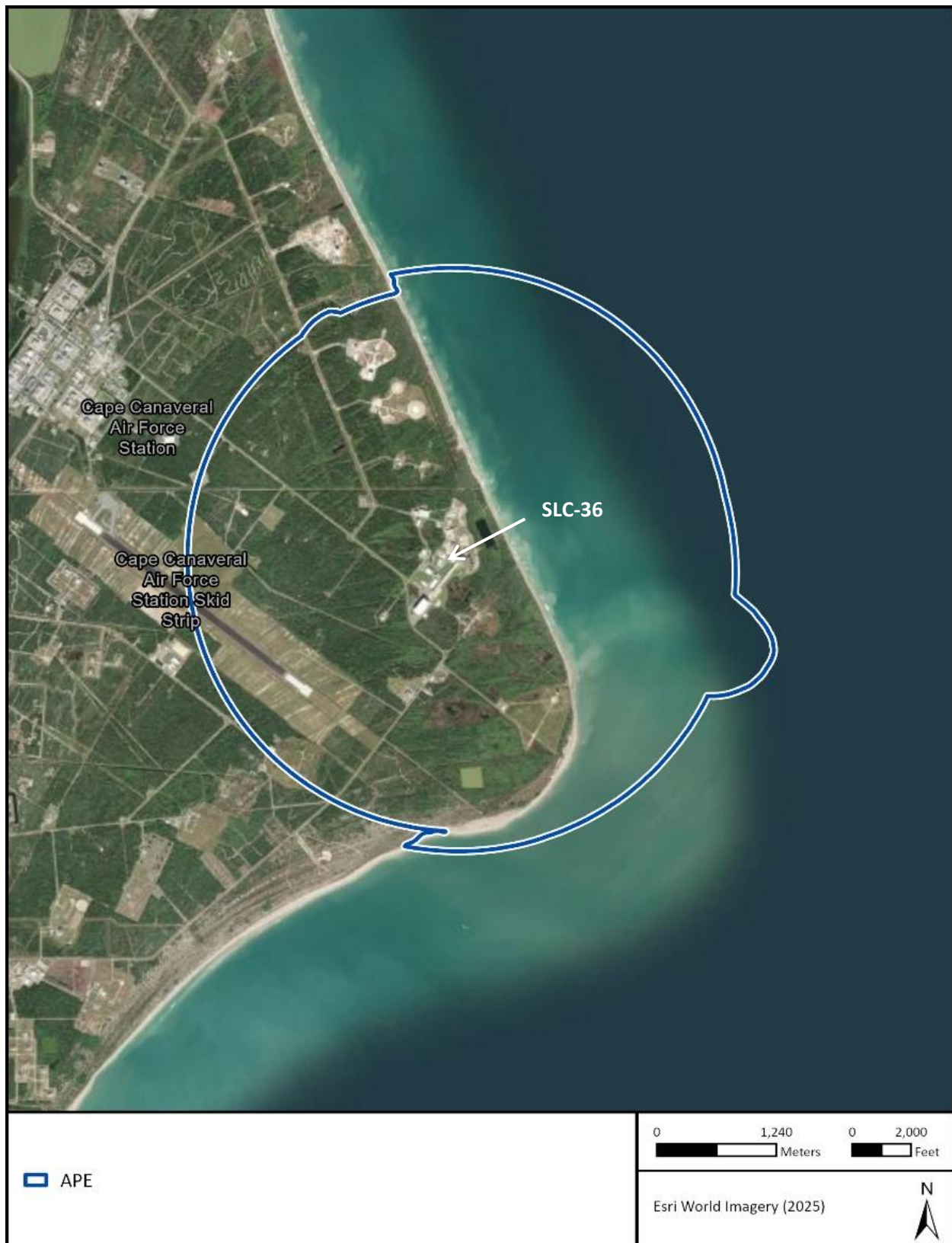


Figure 3.4-1. NHPA Section 106 APE

For historic properties, the primary potential effect from propulsion noise is a short-term change in the auditory setting during an event (i.e., a temporary change in the sound environment that could affect the “setting/feeling” aspect of integrity). This type of effect would be brief and would not permanently alter a historic property’s physical characteristics. Previous NEPA analyses and associated NHPA Section 106 consultations, as referenced above, generally characterize these audible effects as infrequent and short-lived in the context of existing launch activities at CCSFS/KSC. This would be the case for propulsion noise associated with the Proposed Action.

Similarly, potential physical effects to historic structures from propulsion noise are generally considered unlikely but could occur under certain conditions for susceptible or deteriorated elements (e.g., single-pane windows and plaster features) if exposed to very high, short-duration sound levels and associated vibration. Recent launch-related NEPA documentation and consultations above note that while building/structural damage from operational noise/vibration is possible, damage is uncommon and typically limited to fragile building components rather than major structural elements.

3.4.4.1 No Action

Under the No Action Alternative, there would be no change in New Glenn operations at SLC-36 or relative changes to cultural resources effects within the affected environment. FAA has not identified any additional reasonably foreseeable effects to cultural resources associated with continued New Glenn operations.

3.4.4.2 Proposed Action

Propulsion (engine) noise from New Glenn launches and static fire tests would occur intermittently at SLC-36 and could be audible on and off CCSFS. For the Proposed Action, the modeled 130 dB L_{max} contours for New Glenn operations at SLC-36 (launches and static fires) are not expected to extend beyond CCSFS, indicating that off-installation historic properties would not be exposed to propulsion noise levels at or above this conservative damage-screening threshold. Accordingly, SLD 45 and FAA would not expect physical damage to off-installation historic properties from propulsion noise. The most plausible effect would remain a temporary change in auditory setting during discrete events, which would be short in duration and would occur within an existing launch noise environment.

In summary, the buildings, structures, and objects in the APE are mostly constructed of concrete and concrete block. While concrete and concrete block are less elastic to vibratory effects than metal or wood, SLD 45 and FAA have determined that the increased cadence of New Glenn launch operations is not likely to cause damage to resources in a manner that would affect the character of the resources in a manner that would diminish integrity; thus, the project is not likely to result in adverse effects to historic properties under 36 CFR §800.5. The Florida SHPO concurred with this determination on July 28, 2026. Additionally, the Seminole Tribe of Florida indicated on August 11, 2026, that they had no concerns with the Proposed Action; no other contacted tribes provided input on the Proposed Action. Appendix A.2, *National Historic Preservation Act (NHPA)*, provides NHPA Section 106 consultation documentation with the Florida SHPO and other consulting parties.

The DAF as the lead federal agency for Section 106, in coordination with FAA, would continue to consult with the SHPO under Section 106 of the NHPA, federally recognized Native American tribes, and other consulting parties and would implement any required future identification, evaluation, monitoring, and mitigation to address any effects resulting from the Proposed Action and other reasonably foreseeable actions within their jurisdiction. Therefore, FAA has not identified any reasonably foreseeable significant adverse effects to cultural resources as a result of the Proposed Action.

3.5 Natural Resources and Energy Supply

3.5.1 Definition of Resource and Regulatory Setting

This section describes the natural resources (such as water) and energy supplies (such as coal or diesel for electricity; natural gas for heating; and fuel/propellants for the space launch vehicles) that would be consumed under the alternatives evaluated in this EA. Consumption of these resources would occur because of proposed operational activities.

3.5.2 Study Area

The study area for natural resources and energy supply would include local and municipal sources of water and electricity, which would be supplied by providers and sources in Brevard County. Other fuel and fuel-related materials could be provided by suppliers in the southeastern and eastern United States.

3.5.3 Existing Conditions

The existing utility infrastructure at CCSFS, including electrical distribution, wastewater conveyance, and commodities servicing is described in detail in section 3.3.1.2 (*Infrastructure, Affected Environment*) of the SpaceX Starship-Super Heavy CCSFS Final EIS (DAF, 2025a). Electrical service is provided by Florida Power and Light via high-voltage (115-kilovolt) electrical power to substations at CCSFS. The feeds can provide 59 megavolt-amperes to CCSFS, which exceed current requirements. CCSFS maintains the local electrical distribution system, which provides 13.2 kilovolts to the launch complexes (DAF, 2025a). Florida City Gas owns and operates natural gas at CCSFS. Liquefied gases are delivered by tanker trucks or via buried pipelines and standalone pipeline facilities used within specific SLCs. Liquefied natural gas is delivered to CCSFS by truck. Gaseous nitrogen and gaseous helium are delivered to SLC-36 via buried pipelines with metering stations (DAF, 2025a).

The City of Cocoa has an agreement with CCSFS for water and wastewater services. Domestic and industrial wastewater from CCSFS and KSC is treated at the CCSFS Regional Wastewater Treatment Facility. The facility treats wastewater from various sources before releasing it back into the environment. The facility has the capacity to treat approximately 0.8 MGD per day (MGD). As of 2020, approximately 0.436 MGD, which is 55 percent of the facility's capacity, were used. As of 2023, no new sources of nonnutritive discharge are accepted at the CCSFS Regional Wastewater Treatment Facility (DAF, 2025a).

The City of Cocoa's potable water system processed just over 7.4 billion gallons of water in 2025, with a reported average daily flow of 20.7 MGD and peak flow of 25.50 MGD during April (City of Cocoa, 2025). The SJRWMD permits the utility to withdraw an average of up to 31 MGD, with the

permitted maximum peak daily withdrawal rate capped at 48.0 MGD (SJRWMD, 2026; City of Cocoa, 2014).

3.5.4 Environmental Consequences

FAA has not established a significance threshold for natural resources and energy supply in FAA Order 1050.1G; however, FAA has identified a factor to consider when evaluating the context and intensity of potential environmental effects for natural resources and energy supply. This factor includes, but is not limited to, situations in which the proposed action or alternative(s) would have the potential to cause demand to exceed available or future supplies of these resources.

3.5.4.1 No Action

Under the No Action Alternative, there would be no change in New Glenn operations at SLC-36 or relative changes to natural resources use and energy supply effects within the affected environment. No additional reasonably foreseeable effects to natural resources and energy supply would occur associated with continued New Glenn operations.

3.5.4.2 Proposed Action

Operations at SLC-36 would not appreciably contribute to electricity or natural gas loads. Industrial wastewater would be addressed through the permitting process as described in section 1.6, *Permits, Approvals, and Agreements*.

Blue Origin conservatively estimates that SLC-36 launch operations would use/require up to approximately 292.5 MG annually (section 2.1.2, *Launch Operations*). This bounding estimate assumes the maximum number of potential annual operations (50 ILV static fires, 50 second stage static fires, and 50 launches). Based on an estimated annual launch-related water demand of 292.5 MG/year (equivalent to about 0.801 MGD on an annual average basis), this would represent approximately 4.0 percent of Cocoa's 2025 annual processed water volume and would increase average daily demand from 20.7 MGD to approximately 21.5 MGD. A single hot fire or launch event requiring 2.75 MG would increase the reported 2025 peak flow from 25.50 MGD to approximately 28.25 MGD, assuming the event occurred on a peak-demand day.

Based on the analysis above, the Proposed Action would not result in exceedance of permitted annual average daily consumption or peak consumption. Therefore, FAA has not identified any reasonably foreseeable significant adverse effects to natural resources and energy supply because of the Proposed Action.

3.6 Health and Safety

3.6.1 Definition of Resource and Regulatory Setting

This discussion of public health and safety includes consideration for any activities, occurrences, or operations that have the potential to affect the safety, well-being, or health of members of the public and employees. This section identifies potential hazards and standard operating procedures during operations associated with testing and launch activities (includes risks to the public, employees, contractors, and civilians from potentially hazardous activities such as flight

operations, flight trajectory and dispersion, and launch failures) and emergency services and response.

3.6.2 Study Area

The study area includes SLC-36 plus the areas in and around CCSFS that could be affected by launches, test operations, and transport. For this EA, the health and safety study area includes the land area closures, RNAs, safety zones, and operational controls established during testing and launches.

3.6.3 Existing Conditions

FAA is responsible for overseeing the safety of launches. In accordance with 14 CFR part 450, *Launch and Reentry License Requirements*, FAA issues safety approvals only if it is determined that a launch can be conducted without jeopardizing health and safety, including risks to property. No FAA-licensed launch or reentry operation has ever resulted in a fatality or injury to a member of the public, nor has there been any significant public property damage (Coleman, 2024).

The safety environment associated with CCSFS (to include range management) is described in detail in section 3.13.1 (*Land Use, Affected Environment*) of the SpaceX Starship-Super Heavy CCSFS Final EIS (DAF, 2025a).

SLD 45 Range Safety at CCSFS assesses, authorizes, oversees, and if needed, implements safety stoppages on all pre-launch, launch, and landing activities. The purpose of the range safety program is to ensure an acceptable safety standard for the public, installation resources, and onsite workers. Range safety at CCSFS adheres to DAF requirements, including Space Systems Command Manual 91-710, and public laws that relate to safety, including 29 CFR part 1910. A central tenet of range safety are risk assessments for mission-specific operations; through this process, SLD 45 Range Safety establishes Launch Safety Exclusionary Zones for every launch. A detailed discussion of range management processes at CCSFS is provided in the referenced document in section 3.13.1.3 (*Range Management*) (DAF, 2025a).

3.6.4 Environmental Consequences

FAA Order 1050.1G does not establish any significance determination criteria for health and safety-related effects. This section evaluates the public and employee health and safety associated with additional test and launch operations. An effect on public health and safety would be significant if the Proposed Action resulted in a substantial increase in the risks associated with safety of employees, contractors, or the general public; introduction of a new health and safety risk that FAA, CCSFS, or Blue Origin are not prepared to respond to; and the ability of emergency services to respond to an emergency event.

Health and safety risks are an inherent component of launch and landing activities. However, the probability of an off-nominal event is very low. FAA, the USSF, and Blue Origin conduct robust risk assessments and implement health and safety processes to identify and minimize risk. FAA believes that implementation of standard health and safety protocols, along with federal, state, and local agency coordination and emergency response capabilities, minimizes the risk of health and safety effects.

3.6.4.1 No Action

Under the No Action Alternative, there would be no change in New Glenn operations at SLC-36 or relative changes to health and safety within the affected environment. FAA has not identified any additional reasonably foreseeable health and safety effects associated with continued New Glenn operations.

3.6.4.2 Proposed Action

To evaluate safety, FAA uses established federal launch range practices that are considered best engineering practice and that have been demonstrated to adequately safeguard public health and safety and the safety of property, such as described in Space Systems Command Manual 91-710, Range Safety User Requirements Manual, Space Systems Command Instruction 91-710, Launch and Range Safety Program, and Range Commanders Council 319, Flight Termination Systems Commonality Standard. For subsystems and components, publicly available industry consensus standards are maintained by organizations such as the American Society of Mechanical Engineers, the Society of Automotive Engineers, and the American Institute of Aeronautics and Astronautics (FAA, 2012).

The effects of launch activity associated with range safety and management at CCSFS are discussed in detail in section 3.13.2.1.2.3 (*Range Management, Environmental Consequences*) of the SpaceX Starship-Super Heavy CCSFS Final EIS (DAF, 2025a).

As summarized in the referenced document, SLD 45 would establish mission-specific Launch Safety Exclusionary Zones, including blast danger areas, flight caution areas, and flight hazard areas, for every New Glenn launch event. Launch Safety Exclusionary Zones at SLC-36 could affect the operations of neighboring launch service providers and government facilities and could affect the implementation of the prescribed fire management program. SLD 45 would manage the launch schedule to minimize conflicts between launch service providers, and the SLD 45 commander holds ultimate authority to resolve conflicts. In cases of scheduling disputes, SLD 45 mediates using objective criteria, such as national security needs, and contractual obligations. For example, a launch may be delayed to accommodate a time-sensitive National Security Space Launch mission.

The USSF is actively mitigating potential challenges through the development of the CCSFS Spaceport Command and Control Center (SCCC). The SCCC is specifically designed to expand capacity and efficiencies, leveraging and enhancing existing administrative and digital infrastructure to reinforce spaceport management concepts. This centralized approach aims to streamline operations and resource allocation. Furthermore, the USSF emphasizes its commitment to maximizing flexibility. Through mature process execution, the USSF has revised restrictions where possible, allowing for greater flexibility during historically restrictive periods. While acknowledging potential uncertainties introduced by additional programs, the USSF emphasizes a proactive approach to planning. The USSF actively seeks information from launch service providers to understand and adequately plan for the evolving demands on the spaceport. This collaborative approach, combined with the SCCC and continued refinement of access procedures, aims to ensure efficient operations for all launch service providers, even with the increased launch tempo and associated access restrictions.

The StarGate web system, a virtualized, cloud-enabled web system developed by BlueHalo, is designed to act as a complete digital backbone for spaceports and was designed to streamline scheduling and operational management across the full spectrum of spaceport activities, including daily range operations, pre-launch milestones, and launch execution. StarGate holds the official Authorization to Operate at critical launch centers, including SLD 30 (Vandenberg Space Force Base) and SLD 45. As part of the broader range enterprise system, it integrates planning, asset scheduling, and utilization tracking to enhance operational readiness and resource alignment. By enabling real-time coordination among mission stakeholders and improving visibility into asset usage, StarGate would be expected to reduce scheduling conflicts, minimize effects on range management, and promote access to the Eastern Range for all users.

Based on the analysis above, FAA has not identified any reasonably foreseeable significant adverse health and safety effects as a result of the Proposed Action. If, through a potential future evaluation of the safety of Blue Origin New Glenn operations at SLC-36, there could be a need to relocate types of activities performed by SLD 45 or other government agency activities located at CCSFS, any potential relocation would be subject to a separate NEPA evaluation and any associated consultations, as applicable.

3.7 Aviation Emissions and Air Quality

3.7.1 Definition of Resource and Regulatory Setting

Air quality is defined by the concentration of pollutants in the air. Under the Clean Air Act, USEPA establishes National Ambient Air Quality Standards (NAAQS) for six criteria pollutants—ozone, carbon monoxide (CO), nitrogen dioxide, sulfur dioxide, particulate matter (PM, PM with a diameter equal to or less than 10 or 2.5 microns [PM₁₀ and PM_{2.5}]), and lead—and states implement programs to attain and maintain those standards (USEPA, 2025; FDEP, 2025).

Some pollutants (including ozone and portions of PM) form in the atmosphere from precursor emissions (e.g., nitrogen oxides [NO_x] and volatile organic compounds). USEPA also regulates hazardous air pollutants under the National Emission Standards for Hazardous Air Pollutants.

3.7.2 Study Area

The study area for air quality includes Brevard County and the adjacent Atlantic coastline and nearshore waters, as this is the domain that would experience the highest project air quality effects. The transport of project emissions beyond this area would disperse to low ambient levels.

3.7.3 Existing Conditions

CCSFS is located in Brevard County, Florida. According to USEPA, Brevard County is currently in attainment for all NAAQS (USEPA, 2026).

CCSFS operates under a Title V Operating Permit, as it is a major source of emissions (potential to emit greater than 100 tons per year of a regulated pollutant). The Title V permit requirements include annual inventorying of substantial stationary sources of air emissions, monitoring, and recordkeeping. The primary stationary sources of air emissions regulated by the Title V permit include boilers and generators.

For effects analysis of this Proposed Action, emissions generated during operations were compared with Brevard County emissions obtained from USEPA's 2020 National Emissions Inventory (NEI) (USEPA, 2023). NEI data are the latest available; these are presented in Table 3.7-1. *NEI 2020 Criteria Pollutant Emissions for Brevard County, Florida*. The county data include emissions amounts from point sources, area sources, and mobile sources. Point sources are stationary sources that can be identified by name and location. Area sources are point sources from which emissions are too low to track individually, such as a home or small office building, or diffuse stationary source, such as wildfires or agricultural tilling. Mobile sources are any kind of moving vehicle or equipment such as vehicles with gasoline or diesel engines, airplanes, or ships. Two types of mobile sources are considered: on-road and nonroad. On-road sources consist of vehicles such as cars, light trucks, heavy trucks, buses, engines, and motorcycles. Nonroad sources are aircraft, locomotives, diesel and gasoline boats and ships, personal watercraft, lawn and garden equipment, agricultural and construction equipment, and recreational vehicles (USEPA, 2016).

Table 3.7-1. NEI 2020 Criteria Pollutant Emissions for Brevard County, Florida

Location	CO (tpy)	NO _x (tpy)	PM ₁₀ (tpy)	PM _{2.5} (tpy)	SO ₂ (tpy)	VOCs (tpy)	Pb (tpy)
Brevard County	89,676	8,868	6,407	3,997	333	33,352	0.90

Notes: CO = carbon monoxide; NEI = National Emissions Inventory; NO_x = nitrogen oxides; Pb = lead; PM₁₀ = particulate matter with a diameter equal to or less than 10 microns; PM_{2.5} = particulate matter with a diameter equal to or less than 2.5 microns; SO₂ = sulfur dioxide; tpy = tons per year; VOC = volatile organic compound.

Source: (USEPA, 2023)

3.7.4 Environmental Consequences

Air quality in the project area and immediately surrounding region would be affected by emissions from launch operations, including launch, downrange landings, static fire testing, and associated ground support activities at CCSFS.

Operational emissions (launch, downrange landings, and static fires) were estimated and evaluated for their potential to cause or contribute to an exceedance of a NAAQS, increase the frequency or severity of an existing violation, or interfere with attainment or maintenance of an applicable standard (FAA, 2023). Consistent with USEPA guidance for evaluating aircraft and launch-related emissions, the analysis focuses on emissions below 3,000 feet above ground level (nominal atmospheric mixing layer), where emissions are most relevant to ground-level concentrations; emissions above this height disperse aloft and are not expected to measurably affect ambient air quality at ground level. Emissions estimates and assumptions are from the *Emissions Study for Blue Origin New Glenn Operations at CCSFS LC-36* (Appendix D, *Air Emissions Report*) and are compared with Brevard County emissions from USEPA's 2020 NEI to provide regional context; localized dispersion modeling was not conducted.

The study area for assessing air quality effects from criteria pollutants is Brevard County. Brevard County is currently designated as in attainment for all NAAQS. Existing ambient air quality reflects present launch operations, facility activities at CCSFS, and other regional emission sources.

The area immediately surrounding SLC-36 would experience the highest short-term ambient effects associated with launch and static fire operations; however, these emissions are episodic and of short duration.

3.7.4.1 No Action

Under the No Action Alternative, there would be no change in New Glenn operations at SLC-36 or relative changes to air quality within the affected environment. FAA has, therefore, not identified any additional reasonably foreseeable effects to air quality associated with continued New Glenn operations.

3.7.4.2 Proposed Action

Air quality effects from the Proposed Action would occur from launch-related operational activities. Emissions would be generated from first- and second stage static fire testing, launch, ascent, and first stage landing operations associated with the New Glenn vehicle, as characterized in the *Emissions Study for Blue Origin New Glenn Operations at CCSFS LC-36*. Emissions would result primarily from combustion of LOX/LNG (first stage) and LOX/LH₂ (second stage) propellants during static fires and launches.

The Federal Highway Administration considers projects to have a low potential for effect for mobile source air toxics when design year traffic is below 140,000 – 150,000 vehicles per day (FHWA, 2023). The Proposed Action would require roughly 15,000 truck trips per year, which is far below the screening levels. Because Brevard County is in attainment for all pollutants (USEPA, 2026), mobile source air toxics would have low potential for effect and are not quantified.

3.7.4.2.1 Operation

The proposed static fire, launch, and downrange landing operations would occur as described in section 2.1, *Proposed Action*. Annual emissions of criteria pollutants were calculated based on the operational assumptions described in section 2.1.2, *Launch Operations*. Emissions were estimated using the RUMBLE 4.1 emissions modeling tool developed by Blue Ridge Research and Consulting, LLC, which calculates pollutant generation by atmospheric layer for launch, static fire, and landing events based on vehicle configuration and propellant characteristics. Details of emission calculations and modeling assumptions are provided in the *Emissions Study for Blue Origin New Glenn Operations at CCSFS LC-36* in Appendix D, *Air Emissions Report*. (See section 3.7.4, *Environmental Consequences*, methodology for the mixing-layer focus.) This analysis compares the annual emissions associated with the Proposed Action to regional emissions data for Brevard County to provide context regarding the relative contribution of project-related emissions to overall regional air quality. Table 3.7-2 presents the estimated annual operational emissions under the Proposed Action and identifies the incremental increase relative to the currently authorized operations.

Because Brevard County is designated as in attainment for all NAAQS, the General Conformity Rule does not apply to the Proposed Action. The DAF Prevention of Significant Deterioration (PSD) insignificance indicators shown in Table 3.7-2 are provided for informational context only and are not regulatory applicability thresholds for this action. Additionally, downrange emissions would occur over the Atlantic Ocean, which is outside the air quality study area of Brevard County.

As shown in Table 3.7-2, annual emissions associated with up to 50 New Glenn launches, associated static fire testing, and downrange first stage landings were estimated for the troposphere below 3,000 feet. Within this portion of the atmosphere, annual operational

emissions are estimated at approximately 4.66 metric tons of carbon monoxide, 156.8 metric tons of NO_x, 4.33 metric tons of PM₁₀, and 4.33 metric tons of PM_{2.5}.

Table 3.7-2. Annual Operational Criteria Pollutant Emissions – Proposed Action

Activity	Emissions (tpy)						
	VOC	SO ₂	NO _x	CO	PM ₁₀	PM _{2.5}	Pb
First Stage Static Fire	—	—	69	2.20	2.20	2.20	—
Second Stage Static Fire	—	—	24	—	—	—	—
Launch	—	—	57	2.20	1.90	1.90	—
Downrange Landing	—	—	6.80	0.26	0.23	0.23	—
Total Emissions	—	—	156.80	4.66	4.33	4.33	—
ROI Baseline	33,352	333	8,868	89,676	6,407	3,997	0.90
Project Emissions as Percent of ROI Baseline	—	—	1.77%	0.01%	0.07%	0.11%	—
Insignificance Indicators	250	250	250	250	250	250	25
Exceeds DAF PSD Insignificance Indicators?	No	No	No	No	No	No	No

Notes: % = percent; — = Not emitted or negligible based on emissions modeling; AGL = above ground level; CO = carbon monoxide; DAF = Department of the Air Force; H₂O = water; NO_x = nitrogen oxides; Pb = lead; PM₁₀ = particulate matter equal to or less than 10 microns; PM_{2.5} = particulate matter with a diameter equal to or less than 2.5 microns; PSD = Prevention of Significant Deterioration; ROI = region of influence; SO₂ = sulfur dioxide; tpy = tons per year; and VOCs = volatile organic compounds.

¹ The *Emissions Study for Blue Origin New Glenn Operations at CCSFS LC-36* quantified CO₂, H₂O, CO, NO_x, PM_{2.5} and PM₁₀ for the troposphere below 3,000 feet AGL.

² Criteria pollutants not shown (VOCs, SO₂, and Pb) were not emitted or were negligible based on emissions modeling.

³ Percent values are calculated only for pollutants with quantified emissions.

⁴ Calculated values and totals have been rounded; therefore, sum totals might not exactly match the totals row.

⁵ DAF PSD insignificance indicators represent emissions screening thresholds used for applicability review (Air Force Civil Engineer Center, 2025).

Sources: (USEPA, 2023); (Appendix D, *Air Emissions Report*)

NO_x represents the largest criteria pollutant emitted from launch and static fire operations. Annual NO_x emissions are estimated at approximately 156.8 metric tons per year (MT/yr); however, these emissions are episodic and short in duration, occurring during launch ignition, ascent through the lower atmosphere, and static fire testing events. They do not represent continuous stationary source emissions. Emissions disperse rapidly following release and would not be expected to cause or contribute to an exceedance of any NAAQS.

Based on the magnitude, frequency, and episodic nature of emissions, operational activities under the Proposed Action would not be expected to cause or contribute to an exceedance of any NAAQS.

The Emissions Study for Blue Origin New Glenn Operations at CCSFS LC-36 in Appendix D, *Air Emissions Report*, quantified carbon dioxide (CO₂) as the only greenhouse gas pollutant emitted in measurable quantities from New Glenn launch, downrange landing, and static fire operations. Methane (CH₄) and nitrous oxide (N₂O) emissions were not reported in the emissions inventory generated using the RUMBLE model. Although CH₄ is used as a fuel component for the first stage engines (LOX/LNG), the emissions modeling report did not quantify uncombusted CH₄ or N₂O as final emitted species in the atmospheric inventory. Therefore, CO₂ is the only greenhouse gas pollutant quantified for the Proposed Action.

Because CH₄ and N₂O were not quantified, CO₂ equivalent (CO₂e) emissions are equal to the reported CO₂ emissions. The total annual CO₂ emissions associated with up to 50 launches, up to 50 downrange landings, and up to 50 first and second stage static fire tests would be approximately 48,558 MT/yr of CO₂e.

Table 3.7-3 summarizes the annual operational emissions associated with the Proposed Action by activity and compares total annual CO₂e emissions to the USEPA PSD major source permitting threshold.

For context, the USEPA PSD permitting threshold is 75,000 MT/yr of CO₂e for a new major stationary source, provided that the source is otherwise subject to PSD for another regulated pollutant. Although this PSD threshold is not a NEPA significance threshold, it provides a commonly referenced benchmark for evaluating the relative magnitude of emissions.

The estimated annual emissions from the Proposed Action (48,558 MT/yr CO₂e) are below the 75,000 MT/yr PSD threshold. In addition, these emissions are global in nature and are not associated with localized air quality effects. The incremental contribution of 48,558 MT/yr CO₂e to global atmospheric concentrations would be small relative to national and global emission totals.

Table 3.7-3. Other Annual Operational Emissions – Proposed Action

Activity	Emissions (metric tons)			
	CO ₂	CH ₄	N ₂ O	CO ₂ e
First Stage Static Fire	7,078	—	—	7,078
Second Stage Static Fire	—	—	—	—
Launch	39,081	—	—	39,081
Downrange Landing	2,399	—	—	2,399
Total Annual Emissions	48,558	—	—	48,558
EPA PSD Major Source Threshold				75,000
Exceeds PSD Threshold?				No

Notes: — = not emitted, negligible, or not quantified in the emissions modeling report; CH₄ = methane; CO₂ = carbon dioxide; CO₂e = carbon dioxide equivalent; LOX/LH₂ = liquid oxygen and liquid hydrogen; N₂O = nitrous oxide.

¹ CO₂e values are equal to CO₂ emissions because additional species were not quantified.

² The emissions study quantified CO₂ as the primary species emitted from proposed New Glenn operations. CH₄ and N₂O emissions were not quantified in the emissions modeling report. CO₂e emissions are therefore equal to reported CO₂ emissions. Stage 2 static fire operations utilize LOX/LH₂ propellant, which does not contain carbon and does not produce CO₂ emissions.

Source: (Appendix D, *Air Emissions Report*)

Airspace closures would be implemented during launch and landing operations to ensure public safety. These closures could result in minor, temporary changes to aircraft flight paths, including rerouting or short delays. Such changes could result in minor increases in aircraft fuel use and emissions. However, these effects would be short-term and limited to the duration of closure events. Emissions from aircraft rerouting would occur above 3,000 feet (i.e., above the mixing layer) and would not be expected to affect ambient air quality. Given the limited duration and frequency of closures, emissions associated with aircraft rerouting would not be expected to result in measurable effects on air quality or contribute to any exceedance of any NAAQS.

Overall, NO_x is the criteria pollutant emitted in the largest quantities from New Glenn operations; however, launch and static fire emissions are intermittent and disperse rapidly (i.e., they are not continuous stationary source emissions). Given the attainment status of Brevard County, the episodic nature of launch emissions, and the absence of continuous emission sources associated with the Proposed Action, FAA has not identified any reasonably foreseeable significant adverse effects to air quality as a result of the Proposed Action.

Chapter 4. Conclusion

FAA has prepared this EA to evaluate the potential environmental effects of an increase in annual New Glenn operations at SLC-36, to include up to 50 static fire tests of both the ILV (entails a short-duration engine burn of the first stage) and second stage (a total of up to 100) and up to 50 downrange landings on a platform vessel. The environmental effect categories assessed in detail in this EA include noise and noise-compatible land use; biological resources (including fish, wildlife, and plants); historical, architectural, archaeological, and cultural resources; natural resources and energy supply; health and safety; and aviation emissions and air quality.

Unavoidable adverse effects from operational activities have been identified across multiple resource areas (e.g., effects to biological resources); however, none have been identified as potentially significant (noise and air quality in particular).

Physical resources, including gases, fuel, and water, would be expended under the Proposed Action but should generally be in sufficient supply; therefore, their commitment would not have an adverse effect on the resources' local, regional, or national continued or future availability.

Based on the above review and in conformity with FAA Order 1050.1G, FAA has preliminarily concluded that the Proposed Action would not significantly affect the quality of the human environment.

Chapter 5. List of Preparers, Independent Evaluators, and Agencies and Persons Consulted

5.1 List of Preparers

Name: Kevin Akstulewicz

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Years of Experience: 26

Qualifications:

B.S. Environmental Science and Policy

Name: Jay Austin

Role: Noise and Noise-Compatible Land Use

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5.2 List of Independent Evaluators

EA reviewed by FAA

5.3 List of Persons and Agencies Consulted

USFWS

Florida SHPO

Florida State Clearinghouse

Miccosukee Tribe of Indians of Florida

Seminole Nation of Oklahoma

Seminole Tribe of Florida

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