

**DEPARTMENT OF TRANSPORTATION**

**Federal Aviation Administration**

**Office of Commercial Space Transportation**

**Record of Decision and Adoption of**

**Wallops Flight Facility Site-wide Programmatic Final Environmental**

**Impact Statement**

**Introduction and Background**

The National Aeronautics and Space Administration (NASA) acted as the lead agency, and the Federal Aviation Administration (FAA), Federal Highway Administration, National Oceanic and Atmospheric Administration, U.S. Army Corps of Engineers, U.S. Coast Guard, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service (USFWS), U.S. Navy, and U.S. Air Force were cooperating agencies, in the preparation of the May 2019 final *Wallops Flight Facility Site-wide Programmatic Environmental Impact Statement* (Final PEIS), which analyzed the potential environmental impacts of constructing and operating new facilities and infrastructure at Wallops Flight Facility (WFF) over the next 20 years. The Final PEIS was prepared in accordance with National Environmental Policy Act (NEPA) (42 United States Code [U.S.C.] § 4321 et seq.); Council on Environmental Quality (CEQ) NEPA implementing regulations (40 Code of Federal Regulations [CFR] parts 1500 to 1508); NASA procedures for implementing NEPA (14 CFR 1216.3); NASA Procedural Requirements 8580.1; and FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*. NASA signed a Record of Decision on July 2, 2019.

Based on its independent review and consideration of the Final PEIS, the FAA issues this Record of Decision (ROD) concurring with, and formally adopting, the analysis of impacts and findings in the Final PEIS associated with launch vehicle (LV) operations to support the FAA's potential issuance, renewal, or modification of licenses or permits for commercial space operations at WFF. This ROD:

- Describes the FAA's Proposed Action;
- Identifies the Preferred Alternative and the environmentally preferable alternative;
- Provides a summary of potential environmental impacts associated with the FAA's Proposed Action; and

- Presents the FAA's findings and determinations.

NASA published a Notice of Availability of the Final PEIS on May 13, 2019. The Final PEIS is the primary reference and basis for preparation of this ROD. The Final PEIS documents the analysis of environmental consequences associated with constructing and operating existing and new facilities and infrastructure at WFF across a 20-year planning horizon. Future WFF facility growth and operation missions and activities across the 20-year horizon are identified in the 2008 WFF Facility Master Plan (which is currently under review and revision).

This ROD is prepared pursuant to the requirements of NEPA; the CEQ's regulations for implementing NEPA; and FAA Order 1050.1F.

The FAA is responsible for the accuracy of the information in this ROD. For more information concerning the contents of this ROD, please contact:

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## **Purpose and Need**

NASA has developed a set of strategic management goals for WFF. These strategic management goals include:

- Be the Nation's preferred provider of suborbital and small orbital research carriers and mission services;
- Develop and infuse technologies that increase capability and reduce risk or cost of WFF carriers and range systems;
- Conduct and support meaningful science that is appropriate to the carriers, location, special capabilities, and partnerships that are available at or through WFF;
- Provide, through partnerships, hands-on authentic experiences in aerospace for students and educators to increase interest in science, technology, engineering, and math disciplines and careers;

- Provide quality training and leadership development for NASA’s workforce, WFF employees, and education stakeholders; and
- Provide a workforce and capabilities that can enable WFF and its tenants and partners to be leaders in the field.

The purpose of NASA’s action is to continue to meet these goals and increase WFF’s ability to support a growing mission base in the areas of civil, commercial, defense, and academic aerospace. The need for NASA’s action is to expand WFF’s operational capacities in a manner that supports achievement of NASA’s direction for the future and WFF’s strategic management goals in support of providing unique services to NASA, civil, and commercial customers, defense, and academia.

The purpose of FAA’s Proposed Action is to fulfill the FAA’s responsibilities as authorized by the Commercial Space Launch Act (51 U.S.C. Subtitle V, ch. 509, §§ 50901-50923) for oversight of commercial space launch activities, including licensing launch activities. The need for FAA’s Proposed Action results from the statutory direction from Congress under the U.S. Commercial Space Launch Act, 51 U.S.C 50901(b), to, in part, “protect the public health and safety, safety of property, and national security and foreign policy interests of the United States” while “strengthening and [expanding] the United States space transportation infrastructure, including the enhancement of United States launch sites and launch-site support facilities, and development of reentry sites, with Government, State, and private sector involvement, to support the full range of United States space-related activities.”

## **Overview of the Proposed Action and Alternatives**

In the Final PEIS, NASA considered two alternatives (see Final PEIS Chapter 2 for a description): Proposed Action and No Action. The two alternatives that were considered but eliminated from detailed consideration did not meet the stated purpose and need or were too theoretical (i.e., evaluating different locations as a matter of study but not practicality). Under the No Action Alternative, the level of projects and operational activities at WFF would remain at present levels and within previously established envelopes.

The FAA’s Proposed Action is to issue, renew, or modify licenses and/or permits to applicants for commercial space launch operations at WFF. This ROD addresses only those aspects of the activities considered in the Final PEIS for which the FAA has regulatory authority, namely the potential renewal or modification of an existing launch site operator license (LSOL) and issuance, renewal, or modification of launch licenses or experimental permits for commercial space operations at WFF. The Virginia

Commercial Space Flight Authority (VCSFA) is currently licensed by the FAA to operate the Mid-Atlantic Regional Spaceport (MARS) at WFF as a commercial space launch site. Orbital Sciences Corporation<sup>1</sup> is currently licensed by the FAA to operate the Antares, Minotaur, and Pegasus LVs at WFF. The FAA expects to receive applications from VCSFA, Orbital, and others to conduct launch operations at WFF as described in the Final PEIS.

Under the FAA's Proposed Action, the FAA would 1) modify VCSFA's LSOL to operate MARS to account for any changes to MARS or proposed launch operations as described in the Final PEIS and 2) issue, renew, or modify launch licenses or experimental permits to launch operators for commercial space operations at WFF, including MARS. The Final PEIS identified several MARS projects that may require modifying VCSFA's LSOL, including the *institutional support projects* (i.e., all construction, demolition, and repair-by-replacement activities) that could be constructed over the 20-year planning horizon. These institutional support projects include a new launch pad (Pad O-C), new launch pier (Pier O-D), project support building, and processing facility. The Final PEIS also identified several *operational missions and activities* relevant to MARS, including up to six annual liquid fueled intermediate class (LFIC) LV launches and return-to-launch-site (RTLS) landings and 12 annual solid fueled heavy class (SFHC) LV launches that would be distributed among launch Pads O-A (existing), O-B (existing), O-C (proposed), and Pier O-D (proposed). The LFIC is the envelope liquid-fueled LV to be launched and SFHC is the envelope solid fueled LV to be launched, both representing the largest LVs ever to be launched from WFF. Operational missions and activities also include several suborbital horizontal launch and landing vehicles that could use WFF's existing Main Base airfield, such as Virgin Galactic's SpaceshipTwo/WhiteKnightTwo, Virgin Orbit's LauncherOne, and Generation Orbit's GO Launcher 1 and GO Launcher 2. The FAA anticipates relying on the environmental analysis in the Final PEIS to support the issuance of licenses and permits for operations and LVs that fall within the operational parameters and envelopes of those analyzed in the Final PEIS. Upon receipt of a license or permit application, the FAA would conduct an environmental review to determine if the Final PEIS is adequate for the application per FAA Order 1050.1F. License and permit applications for launch activities falling outside or beyond operational parameters and envelopes analyzed in the Final PEIS will require additional environmental review.

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<sup>1</sup> Orbital Sciences Corporation merged with Alliant Techsystems in 2014 to create Orbital ATK. Orbital ATK was acquired by Northrup Grumman Innovation Systems in 2018.

The environmentally preferable alternative in the Final PEIS is the No Action Alternative, because it would avoid environmental impacts to several resources that would result from the proposed institutional support projects and operational missions and activities. This alternative was not selected because it would not allow for WFF to support a growing mission base in the areas of civil, commercial, defense, and academic aerospace research. Taking no action is not the FAA's preferred alternative because it is not consistent with the FAA's purpose of and need for action, including the FAA's statutory direction from Congress under the Commercial Space Launch Act to encourage, facilitate, and promote commercial space launch and reentry activities by the private sector in order to strengthen and expand U.S. space transportation infrastructure.

### **Selected Alternative and Summary of Necessary Permits and Approvals**

The issuance of this ROD fulfills the FAA's requirements under NEPA. As a cooperating agency, the FAA adopts NASA's Final PEIS and does not need to provide for additional public review and comment (see 40 CFR § 1506.3(c)). The FAA has selected its Proposed Action as the preferred alternative, which supports NASA meeting its strategic management goals on providing WFF's direction for the future and increasing WFF's ability to support a growing mission base in the areas of civil, commercial, defense, and academic aerospace research.

### **Public and Agency Involvement**

NASA provided opportunities for the public to give input on the proposed action through the public scoping period held in 2011, and again through the public comment period for the Draft PEIS in 2018. Scoping for the development for the PEIS began with the publication of the Notice of Intent in the *Federal Register* on July 11, 2011 (76 FR 40753). NASA held two public scoping meetings on August 3, 2011 – one for the regulatory agencies and one for the general public. The scoping period ended on September 2, 2011; however, comments received after the end of the scoping period were considered. A 45-day public review and comment on the Draft PEIS was initiated with publication of the Notice of Availability (NOA) in the *Federal Register* on May 4, 2018 (83 FR 19839–19841). NASA hosted a public meeting for the Draft EIS on May 23, 2018. Final PEIS Appendix C and Appendix I contain the scoping summary report and NASA's responses to comments submitted during the Draft PEIS public comment period, respectively. NASA issued the NOA for the Final PEIS in the *Federal Register* on May 13, 2019 (84 FR 20910-20912).

An electronic version of the Final PEIS is posted on NASA's website:

[https://code200-external.gsfc.nasa.gov/250-wff/site-wide\\_eis](https://code200-external.gsfc.nasa.gov/250-wff/site-wide_eis).

The FAA was a cooperating agency on the PEIS and concludes that all comments and suggestions on the PEIS have been satisfied and adopts the PEIS without needing to recirculate it (see 40 CFR § 1506.3(c)).

## **Summary of the Environmental Consequences of the Proposed Action (Preferred Alternative)**

The FAA conducted an independent review of the Final PEIS and considered impacts relevant to FAA's Proposed Action of issuing, renewing, or modifying licenses and/or permits to applicants for commercial space launch operations at WFF. The FAA's Proposed Action is much narrower than NASA's proposed action analyzed in the Final PEIS, and therefore, this ROD focuses on the environmental consequences of commercial launch activities that could occur at WFF over the 20-year planning horizon. Projects and activities in the Final PEIS relevant to FAA's Proposed Action are summarized above in the *Overview of the Proposed Action and Alternatives* section. The results of the FAA's review are summarized below for the selected alternative, Proposed Action.

The Final PEIS analyzed the direct, indirect, and cumulative environmental impacts of constructing and operating new facilities and infrastructure at WFF to support a growing mission base in the areas of civil, commercial, defense, and academic aerospace. There would be direct and indirect adverse impacts from commercial space launch operations, but none considered to be significant.

The following sections summarize the impact analysis for each environmental impact category under FAA's Proposed Action, including the cumulative impacts of the FAA's Proposed Action when combined with other past, present, and reasonably foreseeable future actions. The Final PEIS did not include an analysis of farmlands and natural resources and energy supply because no impacts to these environmental impact categories are anticipated. Cumulative impacts are addressed in this ROD only for noise, air quality, water resources, terrestrial wildlife, special-status species, and marine mammals and fish. The Final PEIS did not address cumulative impacts for other resources in detail because NASA determined that cumulative effects on those resources were non-existent or negligible.

## Air Quality

MARS-related construction of Pad 0-C, Pier 0-D, the project support building, and processing facility would result in temporary impacts to air quality. Emissions from construction activities would include emissions from on- and off-road heavy diesel-powered construction equipment and trucks, emissions from the commute of construction workers to and from the site, and fugitive dust emissions during construction. The Final PEIS modeled emissions for all WFF institutional support projects, and concluded that for criteria pollutants, annual emissions from these projects would be well below the comparative mobile source threshold (227 metric tons [250 tons]) and therefore would have a less than significant impact on air quality [Final PEIS 3.2 at 3-32]. Because the MARS-related construction activities are subsumed by all of the WFF institutional support projects, there would be less than significant impacts on air quality from MARS-related construction activities.

The FAA's issuance of licenses or permits for launch and reentry operations could affect air quality. Individual launches and landings would be short-term, discreet events. Therefore, atmospheric concentrations would differ depending on local meteorological conditions at the time of the launch, such as temperature profiles, atmospheric stability, wind speeds, and the presence or absence of inversions. Although LV emissions would be released in the lower atmosphere, they would be rapidly diluted and dispersed by prevailing winds. The Final PEIS modeled annual emissions for all operational missions and activities (i.e., two generators at Wallops Island, one generator at Main Base, LFIC LV launches/RTLS landings and SFHC LV launches, and unmanned aerial system (UAS) operations), and concluded that for criteria pollutants, annual emissions from these operations would be below the comparative threshold and therefore less than significant. Because the MARS-related vertical launch activities are subsumed by all proposed WFF operational activities, there would be less than significant impacts on air quality from rocket launches and landings [Final PEIS 3.2 at 3-37].

Air emissions from other present and future projects, when considered incrementally with activities analyzed in the Final PEIS, are not expected to exceed any regulatory standards or affect the attainment status of Accomack County. The projected annual emissions from all institutional support projects and operational missions and activities would be well below the 250 tons per year comparative mobile source threshold. Because FAA's action would be subsumed by all activities under NASA's proposed action, the FAA's Proposed Action would not result in significant cumulative impacts to air quality [Final PEIS 5.4.2 at 5.14].

## Biological Resources (including Fish, Wildlife, and Plants)

### *Terrestrial*

MARS-related construction of Pad 0-C, Pier 0-D, the project support building, and processing facility would result in permanent and temporary removal of vegetation and wildlife habitat. Preliminary siting for the project support building and processing facility indicate these structures would be constructed in previously disturbed areas that provide little habitat value. No detailed designs exist for Pad 0-C or Pier 0-D, but NASA estimates that Pad 0-C could affect up to 5 acres of tidal wetland vegetation and habitat. Additional environmental review would be needed prior to permitting and constructing these facilities. Permanent removal of terrestrial and wetland habitat would displace wildlife to nearby habitats. Smaller, less mobile species and those seeking refuge in burrows could inadvertently be killed during construction activities. Invasive *Phragmites* plants could invade areas disturbed during construction and further limit available habitat and affect habitat suitability for plants and wildlife. However, disturbance to natural habitats would constitute a small fraction of the natural habitats found at WFF, and all construction would follow the 2014 WFF *Phragmites* Control Plan to prevent the spread of *Phragmites*. Construction noise could also temporarily disturb wildlife and displace individuals to adjacent habitats; however, this impact would be short-term and temporary, lasting only the duration of construction. No long-term permanent impacts to wildlife populations are expected [Final PEIS 3.9 at 3-132].

Launch and landing activities could adversely affect vegetation and habitat by causing small brush fires and acid deposition from exhaust and deluge water, which could injure or kill sensitive plants. Vegetation community structure changes are possible with a loss of more sensitive species and an increase of more tolerant species. However, launch impacts would be infrequent and likely confined to an area approximately 1,000 feet around the launch pad. Disturbance to wildlife could occur from pre-launch activities, night lighting, launch noise and vibration, and potential toxicant deposition from exhaust plumes generated by the LVs. Noise is the primary impact to wildlife from launch activities, which would likely startle or flush mobile species, which would flee or retreat to safer areas. Rocket exhaust with a 1,000-foot radius could also result in injury or mortality of any wildlife that may be in the path of the flame duct. Sonic booms generated during a RTLS landing could startle wildlife, depending on the trajectory and atmospheric conditions; however, the impact on wildlife would not be significant. Deposition of acid from exhaust would occur around the launch pad, but exhaust has not been shown to have long-term impacts on wildlife, and most wildlife would likely avoid the area during launch activities. While launches of LVs may result in direct mortality and disturbance to wildlife, due to the

rather infrequent launches of the LVs, population level impacts to any wildlife occupying WFF habitats are not expected. Therefore, there would be no significant long-term impacts to terrestrial wildlife from the FAA's Proposed Action [Final PEIS 3.9 at 3-135 to 3-136].

Impacts to federally listed threatened and endangered species under the jurisdiction of the U.S. Fish and Wildlife Service (USFWS) have been addressed pursuant to ESA Section 7 through a 2019 Biological Opinion (BO) issued to NASA for ongoing operations at WFF. The BO covers the activities addressed in the Final PEIS, and therefore covers activities related to FAA's Proposed Action. As part of the BO's terms and conditions, WFF administers a Protected Species Management Plan. This plan is reviewed annually in cooperation with the USFWS and revised if applicable. Two bald eagle nests are located on Wallops Island, with the nearest nest approximate 3 miles from the proposed Pad 0-C and Pier 0-D. No construction would occur in the vicinity of the nests. Therefore, the FAA's Proposed Action would not result in significant impacts [Final PEIS 3.10 at 3-160, 3-162 to 3-168].

Given the temporary and intermittent nature of proposed construction and operational activities that terrestrial wildlife are currently exposed to, as well as general operational activities, and the likely separation in implementation time frames, there is little potential for cumulative effects to resident terrestrial wildlife populations from the FAA's Proposed Action in combination with other past, present, and reasonably foreseeable future actions. Similar cumulative effects would be anticipated for terrestrial special status species, but given the sensitivities of these species, the impacts could be more pronounced. However, WFF could continue to operate under the terms and conditions of the BO as well as implement the Protected Species Management Plan. Therefore, cumulative effects to terrestrial wildlife and special status species under FAA's Proposed Action are not anticipated to be significant [Final PEIS 5.4.5 at 5-23 to 5-25].

#### *Aquatic*

Construction of Pad 0-C and Pier 0-D may affect marine special status species, marine mammals, fish, aquatic habitats, and Essential Fish Habitat (EFH). Impacts would be dependent on final designs and specific locations of the projects, and project-specific environmental reviews would be required as project details are confirmed. Typical impacts to aquatic species and habitats would include underwater noise, direct aquatic habitat loss, sedimentation and turbidity from construction runoff, accidental spills of petro-chemicals, and spreading of *Phragmites* into aquatic habitats.

Launch and landing activities could impact aquatic organisms and habitat primarily from acid deposition into surface waters and falling rocket stages into the ocean. Acid deposition in surface waters near

launch pads has been shown to have adverse impacts on fish, including mortality. However, some tidal flushing would occur and acidification levels would be temporary and return to normal. Jettisoned rocket stages would fall into the ocean and have the potential to impact aquatic species (e.g., a direct strike). However, the chances of striking an individual animal are low and rocket stages and any debris would rapidly sink to the ocean floor and would be unlikely to create any significant hazards to aquatic species or their habitats, including federally listed fish, sea turtles, and marine mammals. NASA consulted with NMFS in 2009 regarding potential impacts of Antares launch operations at WFF on protected marine species and concluded that protected marine species would not be adversely affected. The LFIC LV and SFHC LV are larger vehicles than Antares, but these LVs would have similar impacts to marine and fish as vehicles currently launched from WFF.

Based on the best available information at this time, no significant cumulative effects to fish, EFH, marine mammals, or federally listed aquatic species are anticipated from implementation of the FAA's Proposed Action [Final PEIS 3.11 at 3-182, 3-186; 3.10 at 3-160].

### Climate

Release of greenhouse gases (GHGs) would occur from energy used to support MARS-related construction activities and launch operations at WFF. Construction activity emissions include vehicle emissions and heavy machinery, and operations emissions primarily include launch and landing emissions. The Final PEIS projected GHGs for all WFF institutional support projects (i.e., all construction, demolition, and repair-by-replacement activities over the 20-year planning horizon) and operational missions and activities, and concluded that these projects and activities would not significantly contribute to global emissions of GHGs. Because the MARS-related construction activities and launch activities are subsumed by all of the WFF institutional support projects and operational missions and activities, the FAA's Proposed Action would also result in a less than significant GHG contribution. No significant climate-related impacts are expected [Final PEIS 3.2 at 3-33 to 3-36].

### Coastal Resources

The institutional support projects and operational missions and activities proposed in the Final PEIS, including actions related to the FAA's Proposed Action, would have effects on the Virginia Coastal Zone. Although federal lands like WFF are excluded from Virginia's Coastal Zone Management Program (CZMP), any activity on federal land that has reasonably foreseeable coastal effects must be consistent with the enforceable policies of the CZMP. NASA prepared and submitted to the Virginia Department of

Environmental Quality (VDEQ) a Federal Consistency Determination (FCD) for the proposed institutional support projects and operational missions and activities that were covered in the Final PEIS. The VDEQ concurred with the FCD findings, provided all applicable permits and approvals are obtained prior to implementing the proposed activities. Because the MARS-related construction activities and launch operations are subsumed by all of the WFF institutional support projects and operational missions and activities, the FAA's Proposed Action would also be consistent with Virginia's CZMP, provided all applicable permits and approvals are obtained by an applicant. Therefore, the FAA's Proposed Action would not result in significant impacts on coastal resources [Final PEIS 3.5 at 3-97].

#### Department of Transportation Act Section 4(f)

The FAA's Proposed Action would not be considered a physical or constructive use of 4(f) properties because impacts from the proposed institutional support projects and operational missions and activities would not adversely impact parks, recreation areas, wildlife refuges, or structures listed in or eligible for the National Register of Historic Places. The Final PEIS determined that all institutional support projects would have no direct or indirect impacts to Section 4(f) properties in the areas surrounding WFF, as all projects would occur within the WFF boundaries (except maintenance dredging, which does not apply to FAA's Proposed Action). Closures of the southern end of Chincoteague National Wildlife Refuge (CNWR) and Assateague Island National Seashore (AINS) could be required for launches and landings from Pad 0-C or Pier 0-D. Additionally, USFWS overland access to adjacent Assawoman Island (also part of CNWR) could be restricted when pre-launch and launch-day hazard arcs are activated. NASA has an established agreement with USFWS and the National Park Service (NPS) for such closures and coordinates with USFWS and NPS personnel during mission planning to ensure that closures do not adversely affect CNWR and AINS activities. The value of CNWR and AINS in terms of its significance and enjoyment is not substantially reduced or lost due to launch activities at WFF. The USFWS concurred with the determination that the Proposed Action would not be considered a physical or constructive use of 4(f) properties (see Final PEIS Appendix B). Therefore, the FAA's Proposed Action would not have a significant impact on a Section 4(f) property [Final PEIS 3.6 at 3-108, 3-110].

#### Hazardous Materials, Solid Waste, and Pollution Prevention

MARS-related construction of Pad 0-C, Pier 0-D, the project support building, and processing facility could result in a temporary increase in hazardous material use. However, hazardous materials would continue to be managed in accordance with current WFF procedures. NASA does not anticipate the

amount of hazardous materials used would impact human health or the environment or the ability for these materials to be managed in accordance with current WFF procedures. Therefore, the Proposed Action would not have a significant impact related to hazardous materials management.

Operational missions and activities would involve the continued use of hazardous materials such as hydraulic fluid, oil, hydrocarbon propellants (e.g., RP-1 and liquid methane), cryogenic fuels (e.g., liquid hydrogen, liquid nitrogen, and liquid oxygen), and solid rocket fuels. There is potential for slight increases in the types and quantities of hazardous materials, substances, and hazardous waste from proposed operational missions and activities. The greatest risks from the use of most hazardous materials are associated with spills or leaks. However, the types of hazardous materials, substances, and hazardous waste would be similar to those used or generated during current conditions at WFF and would be managed in accordance with current WFF procedures. Therefore, the Proposed Action would not result in significant impacts related to hazardous materials, solid waste, and pollution prevention [Final PEIS 3.3 at 3-46 to 3-49].

#### Historical, Architectural, Archeological, and Cultural Resources

In accordance with Sections 106 and 110 of the National Historic Preservation Act (NHPA), NASA developed a Programmatic Agreement (PA) with the Virginia State Historic Preservation Office (SHPO) and Advisory Council on Historic Preservation in 2014 to outline how WFF will manage its cultural resources as an integral part of its ongoing operations and missions. Therefore, activities related to the FAA's Proposed Action at WFF would fall under the process and terms and conditions outlined in NASA's PA.

No archaeological (below ground or underwater) resources or above-ground historic properties are known to be present within any of the MARS-related construction projects. In the event that previously unrecorded historic properties are discovered during project activities, NASA would follow the requirements of the PA and would immediately stop work in the area and contact the Virginia Department of Historic Resources. During preparation of the PA, the Virginia SHPO concurred with NASA's determination that based upon the distance between the launch range and historic properties, WFF operations would have no impact on historic resources; this includes any commercial space launch operations. Therefore, the Proposed Action would not result in significant impacts on historical, architectural, archeological, and cultural resources [Final PEIS 3.18 at 3-229 to 3-231].

## Land Use

Implementation of all WFF institutional support projects, including actions related to the FAA's Proposed Action, would be consistent with Accomack County's land use plans. Additionally, no construction projects would require changes to land use designations. Launch operations at WFF would not require changes to land use since the LVs would be operated in areas designated for such operations. Therefore, the FAA's Proposed Action would not impact land use [Final PEIS 3.6 at 3-108 to 3-109].

## Noise and Noise-Compatible Land Use

Constructing MARS-related projects would result in a temporary increase in noise from use of construction equipment. Construction noise would be temporary over the course of the individual project, would be confined to WFF boundaries, and would most likely be confined to general working hours (8:00 a.m. to 5:00 p.m.). Construction noise levels associated with equipment would attenuate to background levels (conservatively, approximately 55 A-weighted decibels [dBA]) in approximately 1,600 feet. Noise would attenuate below the Occupational Safety and Health Administration 8-hour exposure limit of 90 dBA within approximately 100 feet. Standard effort to minimize entry into an active construction zone (i.e., fencing) would create a general buffer around the construction area and ensure that non-construction personnel would not be exposed to unsafe noise levels. Therefore, noise generated from construction activities would not create significant noise impacts [Final PEIS 3.1 at 3-117].

Launch operations would exceed the current rocket noise envelope at Wallops Island, as the proposed vertical LVs represent the largest rockets ever to launch at WFF. Blue Ridge Research and Consulting (Blue Ridge) completed noise modeling to estimate the potential noise impacts from LFIC and SFCH LV launches (see Final PEIS Appendix D). The FAA's Office of Environment and Energy approved Blue Ridge's noise modeling methodology. Figures 19–21 in Blue Ridge's 2015 noise report for launches (Final PEIS Appendix D) depict the A-weighted sound exposure level (SEL) contours for LFIC and SFCH LV launches from Pads 0-A, 0-B, and 0-C. Figure 4 in Blue Ridge's 2017 noise report for landings (Final PEIS Appendix D) depict the A-weighted SEL contours for a LFIC LV landing at Pad 0-C. The innermost contour line of these figures is at SEL 125 dBA, approximately one-half mile from the launch facility. Assuming no nighttime launches, and a total of 24 annual launch noise events, this SEL value corresponds with 64 day-night average sound level (DNL) (and much lower at residential areas much further away), which is less than FAA's significance threshold of 65 DNL. This area does not include any noise sensitive areas.

Therefore, LFIC and SFHC LV launches would not result in significant noise impacts [Final PEIS 3.1 at 3-18 to 3-24].

Sonic booms would also be generated during a RTLS landing, which could potentially result in overpressure levels greater than 2 pounds per square foot within 6 miles of the descent trajectory. However, the magnitude of a potential sonic boom would be highly dependent on the actual RTLS mission trajectory and atmospheric conditions at the time of flight. To minimize exposure from sonic booms during an RTLS event, WFF would continue to adhere to procedures to protect the public and staff by implementing controls to minimize or eliminate the associated risks. This includes enforcing a hazard area where no members of the public, mariners, and airmen would be permitted, and limiting launches to times when favorable meteorological conditions are present. Moreover, no more than six RTLS landing events would be authorized in a 12-month period. Therefore, no significant noise impacts from landings are expected [Final PEIS 3.1 at 3-24].

Noise associated with horizontal launch and landings would be typical of existing jet aircraft that use WFF; however, vehicles returning to WFF to perform a horizontal landing could reenter the airspace at supersonic speeds capable of creating a sonic boom. The magnitude of a sonic boom would be highly dependent on the reentry trajectory and atmospheric conditions at the time of flight. None of the proposed LVs noted in the Final PEIS would create sonic booms such that physical damage would occur. If the FAA received an application for launches of a proposed LV outside the bounds of the Final PEIS, the FAA would conduct additional environmental review.

No significant cumulative noise impacts associated with launch operations are anticipated. Overlap between baseline operational aircraft, other WFF launch operations, and commercial space operations would create minor cumulative noise impacts [Final PEIS 5.4.1 at 5-12].

#### Socioeconomics, Environmental Justice, and Children's Environmental Health and Safety Risks

The Final PEIS determined that no potentially high or adverse impacts would occur to the surrounding community from activities associated with any of the institutional support projects at WFF; therefore, no disproportionately high or adverse impacts would occur to minority or low-income populations or to children's environmental health and safety. As such, MARS-related construction would not affect environmental justice populations and would not have the potential to lead to a disproportionate health or safety risk to children [Final PEIS 3.16 at 3-217].

Noise from commercial space launches and landings has the potential to disproportionately affect minority and low-income populations, as well as the environmental health and safety of children. Returning LFIC LV noise levels would exceed 115 dBA within approximately 0.4 mile from the landing site. However, as part of a ground-truthing effort, WFF plotted all homes within a 3.1-mile radius of the launch range and verified that no occupied structures exist within the 115 dBA or greater contour. As stated in the *Noise and Noise-Compatible Land Use* section, the area affected within the 115 dBA noise contour does not contain occupied structures, noise sensitive areas, or populations, and sonic booms are not anticipated to have significant noise impacts. Therefore, there would be no disproportionate impact to minority or low-income populations or children from the FAA's Proposed Action [Final PEIS 3.16 at 3-220].

Positive economic impacts (e.g., expenditures, tax revenue, job creation, tourism, etc.) might be experienced from all institutional support projects and operational missions and activities. Therefore, the FAA's Proposed Action might contribute to positive economic impacts in the WFF area [Final PEIS 3.15 at 3-211 to 3-212].

#### Visual Effects (including Light Emissions)

Construction of all proposed institutional support projects at WFF under NASA's proposed action would result in negligible impacts to visual resources as the projects would remain consistent with the historical use of the areas and the 2008 WFF Facility Master Plan. Pad 0-C is proposed at the current location of the UAS airstrip at the south end of Wallops Island and is anticipated to be as large as Pad 0-A (approximately 6.4 acres). The location and configuration of Pad 0-C would not be out of character with the surrounding land use or visual aspects of the area and would result in negligible impacts to visual resources. Pier 0-D is proposed on the south end of Wallops Island on either Hog Creek or in the nearshore waters of the Atlantic Ocean. No design specifications for either of the two optional locations are available at this time. In either location, Pier 0-D would most likely consist of a pile-supported, steel reinforced concrete system. The configuration of Pier 0-D would not be in character with the surrounding visual aspects of the shoreline; however, the location and type of operations from Pier 0-D would be in character with the existing land use and visual aspects of the WFF Launch Range, resulting in negligible impacts to visual resources. Therefore, visual effects of new MARS structures would not be significant [Final PEIS 3.17 at 3-222].

The proposed operational mission activities, including horizontal and vertical launches and landings of LVs, would be similar in nature to those already occurring at WFF. Individual launches and landings

would typically be short in duration and would not result in any long-term impacts to visual resources. Therefore, the FAA's Proposed Action would result in minor visual effects [Final PEIS 3.17 at 3-223].

#### Water Resources (including Wetlands, Floodplains, Surface Waters, Groundwater, and Wild and Scenic Rivers)

Construction of Pad 0-C and Pier 0-D may affect surface waters and wetlands by direct aquatic habitat loss, sedimentation deposition and turbidity, and accidental spills of petro-chemicals. Required stormwater permits, site-specific stormwater pollution prevention plans (SWPPP), and site-specific best management practices would avoid or minimize many of these impacts, and therefore, would not result in any long-term effects. A permanent loss of a surface water or wetland would require a Clean Water Act Section 404 permit to compensate for the functional loss of these resources. As required by the 404(b)(1) guidelines, only the Least Environmentally Damaging Practicable Alternative can be authorized through the Section 404 permit process. The Final PEIS provides a maximum estimate of Pad 0-C and Pier 0-D wetland impacts at 5 acres and 0.5 acre, respectively. The final permanent surface water and wetland impact areas would be dependent on final designs and specific locations of all MARS projects [Final PEIS 3.5 at 3-95].

Daily operational impacts to surface waters and wetlands (i.e., stormwater runoff, erosion and sedimentation, accidental spills of hazardous materials) would be avoided or minimized due to implementation of site-specific SWPPPs, BMPs, and compliance with stormwater discharge permits. During vertical launch operations, deluge water would be discharged to a lined retention basin where it would be treated, if required, and released or removed for disposal if it does not meet the standards for discharge to surface waters as stipulated in the stormwater permit. Exhaust clouds from LFIC and SFHC LV launches can affect the pH of surface waters in the vicinity of the launch pad from acid and acid-neutralizing sea salt deposition. However, this impact would be short-term and minor since nearby surface waters have a natural buffering capacity. In the event of a launch failure, potential impacts to water resources could be substantial locally, but clean-up efforts and restoration measures would prevent long-term effects to surface waters and wetlands. Overall, no long-term impacts to surface waters or wetlands from launch activities are anticipated [Final PEIS 3.5 at 3-98 to 3-101].

The MARS-related projects are all located within the 100-year floodplain because all of Wallops Island is within this floodplain. Since WFF mission requirements limit the location of these facilities, there is no practicable alternative to avoid development within and impacts to the floodplain. NASA and/or the FAA would conduct project-specific NEPA analyses once specific details are known.

Construction of Pad 0-C and Pier 0-D is not anticipated to increase the risk of groundwater pollutants as construction would require BMPs to minimize impacts to surface waters, subsurface water, and stormwater that may be located near recharge areas. Launch activities could potentially affect groundwater if fuels leach into the aquifer accidentally. However, the concrete pad and implementation of WFF emergency response and clean-up procedures would avoid or minimize these impacts. No groundwater is anticipated to be used for deluge water during launches, and additional demands of groundwater that may be needed during construction would fall within the current groundwater withdrawal permit at WFF. Therefore, the FAA's Proposed Action is not anticipated to have significant groundwater impacts [Final PEIS 3.5 at 3-100].

No wild or scenic rivers are located on or adjacent to WFF; therefore, the Wild and Scenic Rivers Act does not apply [Final PEIS 3.5 at 3-65].

## Findings and Determinations

The FAA makes the following determinations for this project, based upon the appropriate information and analysis set forth in the Final PEIS and upon other portions of the administrative record:

- **Clean Air Act of 1970 (42 U.S.C. § 7401 et seq.):** The FAA's Proposed Action would not cause an exceedance of any National Ambient Air Quality Standard.
- **Endangered Species Act of 1973 (16 U.S.C. § 1531 et seq.):** Impacts to federally listed threatened and endangered species under the jurisdiction of the USFWS have been addressed pursuant to ESA Section 7 through a 2019 BO issued to NASA for ongoing operations at WFF. The BO covers all of WFF activities, and therefore covers activities related to FAA's Proposed Action. NMFS previously concurred that launch operations at WFF would not adversely affected ESA-listed species. Therefore, the FAA's Proposed Action would not jeopardize the continued existing of a listed species or result in the destruction or adverse modification of designated critical habitat.
- **Coastal Zone Management Act (16 U.S.C. § 1451):** The VDEQ concurred with NASA's FCD findings for all WFF activities address in the PEIS, provided all applicable permits and approvals are obtained prior to implementing the proposed activities. Thus, the FAA's Proposed Action would also be consistent with Virginia's CZMP, provided all applicable permits and approvals are obtained by an applicant. Under FAA policy, the FAA will not issue a license, permit, or

authorization to an applicant unless an applicant's proposed action meets the consistency requirements of the state's coastal management program.

- **49 U.S.C. §303(c) (Section 4(f)):** The FAA has determined that its action would not result in a physical or constructive use of a Section 4(f) property. The USFWS concurred with this determination.
- **National Historic Preservation Act of 1966 (16 U.S.C. § 470):** NASA operates WFF under an existing Section 106 PA. The Virginia SHPO concurred that launch operations would not affect historic properties. Thus, the FAA's Proposed Action would not affect historic properties.
- **Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations; and Department of Transportation Order 5610.2, Environmental Justice in Minority and Low-Income Populations:** The FAA's Proposed Action would not result in a disproportionate impact to minority or low income populations. In accordance with Executive Order and Department of Transportation Order, minority and low income populations were provided opportunities for meaningful public involvement.
- **Executive Order 13045, Protection of Children from Environmental Health Risks and Safety Risks:** The FAA has determined there will be no change in risk to health or safety for children caused by the FAA's Proposed Action.

The FAA has given this proposal the independent and objective evaluation required by the CEQ. [40 CFR 1506.5]

As outlined in the Final EIS, there was a lengthy process that led to the ultimate identification of the preferred alternative and appropriate mitigation measures. This process began through the competitive selection of an independent EIS contractor which was financially-disinterested in the project outcome, and continued throughout the NEPA process. The FAA provided input, advice, and expertise throughout the planning and technical analysis.

## **Mitigation and Monitoring Summary**

The Final PEIS (Chapter 4) describes measures that would be implemented to avoid, minimize, and/or mitigate environmental impacts. The FAA would determine any additional mitigation or monitoring requirements on a project-by-project basis, dependent on the review of a future permit or license application.

## Decision and Order

In making a decision, the undersigned has considered potential environmental impacts as analyzed in the Final PEIS, applicable regulatory requirements, public comments, and FAA's responsibilities to encourage, facilitate, and promote commercial space launches and reentries by the private sector; and to facilitate the strengthening and expansion of the U.S. space transportation infrastructure.

The No Action Alternative would result in the continued use of WFF, without NASA being able to increase WFF's ability to support a growing mission base in the areas of civil, commercial, defense, and academic aerospace research, which would impede the FAA's ability to assist the commercial space transportation industry in meeting projected demand for services and expansion in new markets.

The Preferred Alternative (Proposed Action) would allow the greatest development and growth of the U.S. commercial space launch industry.

The undersigned carefully considered the FAA's goals and objectives in relation to issuing, renewing, or modifying licenses and/or experimental permits for commercial space operations at WFF. The undersigned has considered the purpose and need to be served, the alternative means of achieving them, the environmental impacts of these alternatives, and the mitigation measures available to preserve and enhance the environment. The undersigned has determined that all practicable means to avoid or minimize environmental harm from the selected alternative have been adopted. Based upon the record of this proposed federal action, and under the authority delegated to the undersigned by the Administrator of the FAA, the undersigned finds that the selected alternative described in this ROD is reasonably supported.

Responsible FAA Official:

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Wayne R. Monteith  
Associate Administrator for  
Commercial Space Transportation

13 April 2020  
Date

**RIGHT OF APPEAL**

This decision is taken pursuant to 49 U.S.C. Subtitle VII, Parts A and B, and constitutes a Final Order of the Administrator, subject to review by the courts of appeals of the United States in accordance with the provisions of 49 U.S.C. § 46110.