[4910-13]

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

Office of Commercial Space Transportation

AGENCY: Federal Aviation Administration (FAA)

ACTIONS: Finding of No Significant Impact (FONSI)

SUMMARY: The U.S. Air Force (USAF) acted as the lead agency, and the FAA was a cooperating agency, in the preparation of the October 2014 *Environmental Assessment for the Space Exploration Technologies Vertical Landing of the Falcon Vehicle and Construction at Launch Complex 13 at Cape Canaveral Air Force Station, Florida* (EA)[1] to analyze the potential environmental impacts of Space Exploration Technologies Corp. (SpaceX) conducting vertical landings of a Falcon launch vehicle first stage at Launch Complex (LC)-13 (since renamed LC-1) at Cape Canaveral Air Force Station (CCAFS), Florida. The EA also addresses related land clearing and construction of a main landing pad, contingency landing pads, and supporting infrastructure at LC-1. The National Aeronautics and Space Administration (NASA) also participated as a cooperating agency in the preparation of the EA. The EA was prepared in accordance with the National Environmental Policy Act of 1969 (NEPA), 42 United States Code (U.S.C.) §§ 4321–4347 (as amended); Council on Environmental Quality NEPA implementing regulations, 40 Code of Federal Regulations (CFR) §§ 1500-1508; FAA Order 1050.1E, *Environmental Impacts: Policies and Procedures*[2]; USAF Environmental Impact Analysis Process, 32 CFR Part 989; Department of Defense Directive 6050; and NASA's Procedures for Implementing NEPA, 14 CFR Part 1216.

In November 2007, the USAF published the *Environmental Assessment for the Operation and Launch of the Falcon 1 and Falcon 9 Space Vehicles at Cape Canaveral Air Force Station, Florida* (2007 EA), and in December 2007, the USAF issued a FONSI for that EA. The FAA and

[1] Subsequent to USAF publishing the EA, Launch Complex-13 was renamed to Landing Complex-1.
[2] Subsequent to USAF publishing the EA, the FAA issued its revised NEPA-implementing order—FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*. The EA complies with FAA Order 1050.1F.

NASA were cooperating agencies in the preparation of the 2007 EA. The FAA issued its own FONSI in January 2009. The 2007 EA analyzed the potential environmental impacts of constructing support facilities and operating the Falcon 1 and Falcon 9 launch vehicles at LC-40, and landing Dragon reentry capsules in the open ocean. The 2007 EA also included the USAF leasing land and facilities to SpaceX, and supported the FAA's action of issuing launch and reentry licenses to SpaceX for Falcon program operations at LC-40.

Additionally, in 2013, the USAF published a supplemental EA to the 2007 EA that assessed the potential environmental impacts of Falcon 9 version 1.1 launch operations at LC-40, which included launching payloads such as the Dragon capsule. The USAF published a FONSI in September 2013. The FAA and NASA were cooperating agencies in the preparation of the 2013 supplemental EA. The FAA issued its own FONSI in October 2013.

Because the launch (or takeoff) of Falcon launch vehicles was analyzed in the 2007 and 2013 EAs, the scope of launch operations analyzed in the 2014 EA is limited to the return and landing of the Falcon 9 first stage, or a single core[3] of the Falcon Heavy first stage, at LC-1. The EA assumes a normal launch mission of a Falcon vehicle from CCAFS with the successful separation of the second stage and payload, while the first stage begins its landing sequence.

As the Proposed Action would require Federal actions (as defined in 40 CFR § 1508.18) involving the USAF and FAA, the EA was prepared to satisfy the NEPA obligations of both agencies. The FAA's Federal action in this matter pertains to its role in issuing licenses for the operation of commercial launch and reentry vehicles at launch sites. The USAF issued a FONSI on January 8, 2015, which stated the potential environmental impacts associated with the Proposed Action would not individually or cumulatively result in a significant impact on the quality of the human environment, and therefore, the preparation of an environmental impact statement (EIS) was not required.

SpaceX is required to obtain a launch license from the FAA to conduct Falcon landings at CCAFS. SpaceX could request a new launch license to include takeoff and landing activities, or modify an existing launch license that has been issued to support Falcon 9 launches at CCAFS to include landing activities. Based on its independent review and consideration of the EA, the FAA

[3] Like the Falcon 9 first stage, a single core of the Falcon Heavy first stage contains nine engines.

issues this FONSI concurring with the analysis of impacts and findings in the EA and formally adopts the EA to support the issuance or modification of launch licenses for Falcon landings at LC-1, CCAFS. If changes to the Proposed Action fall outside the scope of the EA, additional environmental analysis will be required prior to the FAA issuing or modifying a license.

After reviewing and analyzing available data and information on existing conditions and potential impacts, including the EA, the FAA has determined issuance or modification of a launch license to conduct Falcon landings at CCAFS would not significantly affect the quality of the human environment within the meaning of NEPA. Therefore, the preparation of an EIS is not required, and the FAA is issuing this FONSI. The FAA made this determination in accordance with all applicable environmental laws and FAA regulations. The EA is incorporated by reference into this FONSI.

FOR A COPY OF THE EA: Visit the following internet address:

- http://www.faa.gov/about/office_org/headquarters_offices/ast/environmental/nepa_docs/review/launch/

or contact Daniel Czelusniak, Environmental Specialist, Federal Aviation Administration, 800 Independence Ave., SW, Suite 325, Washington, DC 20591; email Daniel.Czelusniak@faa.gov; or phone (202) 267-5924.

PURPOSE AND NEED: The purpose of SpaceX's proposal of returning the Falcon first stage to land is so SpaceX can reuse the first stage for future launches. This purpose supports SpaceX's overall missions for NASA and the USAF. The action fulfills the United States' expectation that space transportation costs are reduced to make continued exploration, development, and use of space more affordable. The National Space Transportation Policy of 1994 addressed the commercial launch sector, stating that "assuring reliable and affordable access to space through U.S. space transportation capabilities is fundamental to achieving National Space Policy goals."

SpaceX's proposal is needed to increase the effective, cost-efficient operation of space flight. This would be accomplished by reusing the first stage instead of developing an entirely new stage. The proposal aids SpaceX in fulfilling its mission of supporting the International Space

Station and other commercial enterprises. Demand for launch services has increased over the past 20 years, and projections indicate continued demand into the foreseeable future. For the United States to remain competitive in the space industry, the cost and frequency of launches needs to keep pace with world demand.

The purpose of FAA's Proposed Action is to fulfill the FAA's responsibilities as authorized by Executive Order 12465, *Commercial Expendable Launch Vehicle Activities* (49 *FR* 7099, 3 CFR, 1984 Comp., p. 163) and 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 Commercial Space Launch Act to protect the public health and safety, safety of property, and national security and foreign policy interests of the United States and 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.

PROPOSED ACTION: The FAA's Proposed Action is to issue new launch licenses or modify existing launch licenses to allow SpaceX to conduct Falcon landings[4] at LC-1 at CCAFS. The Proposed Action analyzed in the EA consists of SpaceX conducting Falcon landings at LC-1 and construction activities, including land clearing, construction of a main landing pad and contingency landing pads, and supporting infrastructure modifications at LC-1. While the FAA has no Federal action associated with the proposed construction, potential impacts related to both the issuance of the launch license and the proposed construction are addressed below.

Construction

Construction activities include constructing an approximately 200 foot by 200 foot concrete landing pad at LC-1. This main landing pad would be designed to support the landing of a Falcon first stage. The pad would be constructed on previously disturbed land and surrounded by compressed soil and gravel (refer to Figure 2-5 in the EA). Additionally, four 150-foot diameter concrete contingency landing pads would be constructed. The purpose of these pads would be to accept the safe landing of a Falcon first stage if last-second navigation and landing diversion is required. The two western-most contingency pads would be constructed on previously disturbed

[4] Landings include a Falcon 9 first stage or a single core of a Falcon Heavy first stage.

land. The two eastern-most contingency pads would be constructed in previously undisturbed land. Construction would also include building two access roads to the contingency pads to enable crane movement following a landing at one of those pads.

Land clearing would involve removing approximately 48 acres of vegetation (refer to Figure 2-5 in the EA). Removed vegetation would be transported off-site to an approved burn/burial area or burned onsite with appropriate USAF coordination. It is anticipated that site grading would be required in order to provide a flat, compacted area to construct the two eastern-most contingency landing pads, access roads, and the main landing pad.

At the location of the former block house, a steel and concrete stand would be built to secure the Falcon first stage during post-landing operations (refer to "Trailer/Pedestal Area" in Figure 2-5 in the EA). The stand would consist of four individual pedestal structures which would be transported to the site and bolted to a concrete base. Each of the four pedestals would be about 9 feet tall and 8 feet wide. A mobile crane would lift the stage from the landing pad and place it on the stand.

The existing roadways at LC-1 would be improved to handle mobile crane movement and the Falcon first stage transportation vehicle. The entrance road and existing parking lots could be resurfaced. The new roadways to and between the main and contingency landing pads would be built using pervious gravel and/or river rock material.

Existing power distribution infrastructure would be replaced. A 500-gallon above ground propane tank would be installed to support a small electrical generator. Up to four lattice towers, approximately 20 feet high, would be installed at LC-1, one of which would be attached to a mobile command trailer. The towers would contain equipment needed to ensure adequate Wi-Fi service for the site.

A FireX system[5] would be constructed with three or four remote controlled water cannons mounted on posts above ground to allow for remote firefighting capabilities. An above-ground 12,000-gallon water storage tank would be installed at LC-1 to provide water for the fire-fighting equipment. The water tank would be filled using the existing water supply.

[5] A FireX system is a water deluge system that can be used to help extinguish any fire that might develop.

Operations

Following a nominal Falcon launch from CCAFS, the Falcon first stage would return to LC-1 for landing rather than landing in the Atlantic Ocean. After the first stage engine cutoff, the first stage would be maneuvered into position for retrograde burn, and three of the nine engines would be restarted to conduct the retrograde burn in order to reduce the velocity of the first stage and place the stage in the correct angle to land. Once the first stage is in position and approaching the landing pad, two of the three engines would be shut down to end the boost-back burn. The landing legs on the first stage would deploy in preparation for a final single engine burn that would slow the first stage and enable a safe landing. During the return, a sonic boom is anticipated.

Operations at LC-1 also would include post-flight landing and safing activities. Safing activities would begin upon completion of all landing activities and engine shutdown. The oxidizer system would be purged, and any excess fuel would be drained into an appropriate fuel truck/tanker. Any remaining pressurants (i.e., helium or nitrogen) would be vented, and any explosives would be rendered "inert" prior to declaring the vehicle safe. Then the first stage would be lifted and placed onto the stand, and the landing legs would be removed or folded back into place. The stage would be lowered into a horizontal position, placed on a transport vehicle, and transported to a SpaceX facility.

The FAA could issue mission-specific licenses or operator licenses, which could allow for multiple missions. A mission-specific license expires upon completion of the mission. An operator license expires after five years. SpaceX anticipates that no more than 12 landings per year (one per month) would occur at CCAFS. SpaceX prefers to conduct all landings during daylight hours, but depending on mission needs, there is a possibility that some of the landings could be performed during nighttime. Up to three night landings per year were assumed for the EA.

ALTERNATIVES CONSIDERED: Alternatives analyzed as part of this FONSI include (1) the Proposed Action and (2) No Action Alternative. Under the No Action Alternative, the FAA would not issue or modify any launch licenses to allow SpaceX to conduct Falcon landings at CCAFS. Construction of the main and contingency landing pads and other construction activities

would not occur. The Falcon first stage would continue to land in the Atlantic Ocean. The No Action Alternative would not meet the purpose of and need for the action. The USAF and SpaceX considered additional sites and launch complexes; none were considered reasonable alternatives (refer to Section 2.3 of the EA).

ENVIRONMENTAL IMPACTS

The following presents a brief summary of the potential environmental impacts considered in the EA. This FONSI incorporates the EA by reference and is based on the potential impacts discussed in the EA. The FAA has determined the analysis of impacts presented in the EA represents the best available information regarding the potential impacts associated with the FAA's regulatory responsibilities described in this FONSI. Although not required by FAA Order 1050.1F, this FONSI includes the following additional impact categories because they are addressed in the EA by the lead agency, USAF: geology and soils, health and safety, and transportation.

Air Quality

CCAFS and Brevard County are classified as attainment areas with respect to the National Ambient Air Quality Standards and Florida Ambient Air Quality Standards. During construction and operational activities, emissions from construction equipment, ground support operations, and Falcon landings would cause adverse air quality impacts. However, these emissions would represent an extremely small percentage of the Brevard County regional emissions and would not exceed any thresholds established under the Clean Air Act. Though emissions from Falcon landings would increase the yearly levels of greenhouse gases (GHGs) at CCAFS, the emissions would still be well below the EPA mandatory reporting threshold for stationary sources of 25,000 metric tons of carbon dioxide equivalent, and would represent a negligible fraction of GHG emissions from CCAFS, the United States, or the world. Therefore, the Proposed Action is not expected to result in significant air quality impacts [EA 4.5 at 4-16, 4-18].

Biological Resources (Fish, Wildlife, and Plants)

The Proposed Action would result in the clearing of approximately 48 acres of vegetation (native and invasive). Conversion of the vegetative community in this area from scrub to open grass area

would be compensated through the restoration of overgrown scrub-jay habitat located elsewhere on CCAFS. If construction occurred during the migratory bird nesting season, pre-construction surveys for migratory birds would occur. Additional construction-related impacts would include temporary noise disturbance to individual species in the vicinity of LC-1.

Wildlife species in the vicinity of LC-1 could be affected by launch operations, mainly by launch noise. A Falcon landing would produce much less thrust (89 percent less) and thus much less noise than generated during takeoff. Animal species differ greatly in their response to noise. Wildlife exposed to the landing noise would likely have a startle response. Temporary noise impacts to wildlife are not expected to affect local or regional populations of wildlife, especially since this area is accustomed to launch operations. The majority of the sonic boom footprint and noise exposure would occur over the ocean (refer to Figure 4-1). Animals exposed to the sonic boom on land would likely have a startle response. No significant impacts on terrestrial animal populations from sonic booms are expected. Due to the infrequency of the sonic booms and the low density of marine species in the surface waters of the ocean, sonic booms would not be expected to adversely affect marine species.

Construction activities would have the potential to result in the "take" of federally listed species. The USAF prepared a Biological Assessment and submitted it to the U.S. Fish and Wildlife Service (USFWS) in accordance with section 7 of the Endangered Species Act. The USAF determined the proposed project "may affect and is likely to adversely affect" the Florida scrub-jay, southeastern beach mouse, and the eastern indigo snake. The USAF also determined the proposed project "may affect, but is not likely to adversely affect" the loggerhead, green, leatherback, hawksbill, and Kemp's ridley sea turtles, the American alligator, and the piping plover. Launch noise, including sonic booms, was determined to have insignificant effects on federally listed species. The USFWS concurred with the USAF's determinations and issued a Biological Opinion on September 17, 2014, stating the proposed project is not likely to jeopardize the continued existence of any federally listed species. In its Biological Opinion, the USFWS listed terms and conditions for which the USAF must comply.

After the USAF issued its final EA and FONSI, SpaceX and USAF refined the potential sonic boom analysis based on current vehicle and launch profile data. As a result, USAF determined

that the overpressure values from a Falcon stage landing could be higher than those presented in the EA. The USAF predicts that the overpressure values could range from 3-4 pounds per square foot (psf) on-base and 2-3 psf off-base. The USAF determined the increase in overpressure would still have insignificant effects on federally listed species. The USAF coordinated with the USFWS to determine if this change warranted re-initiation of section 7 consultation. The USFWS agreed that the change does not require re-initiating consultation and the existing Biological Opinion is still valid.

During informal discussions between the USAF and National Marine Fisheries Service (NMFS), the USAF received concurrence from NMFS that the proposed project would have no effect on federally listed species under its jurisdiction and no effect on essential fish habitat.

In conclusion, the Proposed Action would not result in significant impacts on biological resources [EA 4.3 at 4-7, 4-8, 4-9, 4-10].

Geology and Soils

No unique geologic features of exceptional interest or mineral resources occur in the project area. Prior to and during construction, best management practices (e.g., erosion and sediment control measures) would be required to retain sediment on-site and to prevent potential violations of State water quality standards. Thus, the Proposed Action would not result in significant impacts on geology or soils [EA 4.8 at 4-22].

Hazardous Materials, Pollution Prevention, and Solid Waste

The Falcon first stage uses rocket propellant-1 (or RP-1) and liquid oxygen as propellant. Construction activities may require or generate small quantities of hazardous materials or hazardous wastes. Since demolition is not part of the proposed project, asbestos and lead-based paint waste is not a concern. Management of hazardous materials would be completed in accordance with 40 CFR Parts 260-279. All hazardous materials would continue to be handled and disposed of per the requirements established by the Occupational Safety and Health Administration (OSHA) and per the Hazardous Materials Contingency Plan developed for the Falcon Launch Vehicle Program at CCAFS. Since all applicable Federal, State, county, and USAF rules and regulations would continue to be followed for the proper storage, handling, and

use of hazardous materials under the Falcon Launch Vehicle Program, no significant impacts related to hazardous materials are expected. A Falcon landing is expected to generate less solid waste than a Falcon launch/takeoff. Examples of solid waste may include cardboard packaging, wood, rag material, plastic, and aluminum bottles and cans. All solid waste would be disposed of according to CCAFS solid waste management rules and regulations. Thus, no significant impacts related to hazardous materials, pollution prevention, or solid waste are expected under the Proposed Action [EA 4.6 at 4-19, 4-24].

Historical, Architectural, Archeological, and Cultural Resources

LC-1 is not considered a historic property. The mobile service tower was demolished in 2012, and the complex was not listed as a historical landmark. There are no identified historic properties located within the complex boundary or in the immediate vicinity. Three previously unrecorded archaeological sites were identified during an archaeological survey conducted by the USAF between June and August 2014. The USAF determined the sites are ineligible for listing in the National Register of Historic Places and the State Historic Preservation Officer (SHPO) concurred with that determination. Disturbance to these sites would be avoided. Thus, the Proposed Action would have no effects on historical, architectural, archaeological, or cultural resources [EA 4.4 at 4-16].

Health and Safety

Safety hazards are inherently associated with heavy equipment operation and construction activities. All appropriate regulations, including OSHA regulations (29 CFR Part 1926, Safety and Health Regulations for Construction) and local USAF health and safety regulations would be followed. SpaceX would have an on-site safety manager, who would conduct safety meetings and ensure proper safety procedures are followed. Therefore, construction activities are not expected to result in a significant impact related to health and safety [EA 4.11 at 4-24].

CCAFS safety regulations ensure the general public, launch area personnel, and affected land area are provided an acceptable level of safety, and that all aspects of pre-launch and launch

operations adhere to public laws. The range safety organizations[6] at CCAFS use models to predict launch hazards to the public and on-site personnel prior to every launch. These models calculate the risk of injury resulting from toxic gases, debris, and blast overpressure both from nominal launches and launch failures. Launches are postponed if predicted risk of injury exceeds acceptable limits. In addition to the USAF's safety review, as part of the FAA license application review process, the FAA would conduct a public safety review of operations. Thus, the Proposed Action is not expected to result in significant impacts related to health and safety [EA 4.11 at 4-25].

Land Use, Farmlands, and Coastal Resources

The Proposed Action would not change land use or affect land use planning at CCAFS. The Proposed Action would occur at LC-1, which is designated for space launch activities. The Proposed Action would not convert prime agricultural land to other uses, result in a decrease in the land's productivity, or conflict with existing uses or values of the project area or other base properties. No adverse effects to the coastal zone, as defined by the Coastal Zone Management Act, are anticipated. The Florida Department of Environmental Protection determined the Proposed Action is consistent with the Florida Coastal Management Program. Thus, the Proposed Action would not result in significant impacts related to land use, farmlands, and coastal resources [EA 4.1 at 4-2].

Light Emissions and Visual Impacts

Construction and installation of launch-related infrastructure would result in light emissions and visual impacts. The visual presence of the proposed infrastructure would not affect the visual integrity of the area, as this type of infrastructure is well established at CCAFS and considered part of the local landscape. There may be a short-term visible contrail during a Falcon landing. The contrail would be similar in visual impact (though smaller in size) to the plume generated during takeoff and would dissipate quickly as wind and air turbulence affect the trail. Landing operations would not substantially degrade the existing visual character or quality of the site and

[6] The 45th Space Wing safety organizations include ground safety, mission flight control and analysis, and systems safety.

its surroundings. Thus, the Proposed Action would not have significant impacts related to light emissions and visual resources [EA 4.1 at 4-2].

Natural Resources and Energy Supply

The current potable and non-potable water supply, which would be available for Falcon operations, was originally designed to support Atlas launches. Since the Proposed Action would include landing a reusable launch vehicle, typical launch deluge water would not be used. The Proposed Action does not include building any habitable structures at the facility. The Proposed Action's reliance on the water supply would be relatively small. Therefore, the Proposed Action would not have a significant impact on CCAFS's water supply.

The electrical power capabilities for operations at LC-1 were designed to support the Atlas launch program. If needed, electrical demand for construction activities would be satisfied by a small propane-driven electrical generator. Electrical needs during a landing event would be minimal and would include lights, small pumps, communications equipment, and site cameras. Thus, the Proposed Action would not have a significant impact on natural resources and energy supply [EA 4.10 at 4-23, 4-24].

Noise and Compatible Land Use

There are no noise sensitive areas (e.g., schools, hospitals) in the vicinity of LC-1. Construction activities would occur during the daytime. Noise levels during construction would not exceed current levels in the area. Therefore, construction noise would not result in significant noise impacts [EA 4.2 at 4-4].

Operational noise would occur from engine noise as the first stage descends and lands, and from sonic booms during descent. Because the approved models identified in FAA's NEPA-implementing order for modeling noise levels of proposed actions are not suitable for predicting rocket launch noise, USAF implemented a non-standard noise methodology to predict noise levels of Falcon landings. On December 8, 2014, the FAA Office of Environment and Energy determined the methodology was appropriate and provided its approval of the methodology.

Launch noise levels at a launch site are directly correlated to the thrust of the launch vehicle at lift-off or landing. The Falcon first stage would land at LC-1 with one engine operating, or one ninth of the total thrust energy. Since noise is a function of acoustical energy, the expected noise profile from a first stage landing would be (up to 80 percent) less than that of a launch. The noise analysis conducted for the EA predicts a 1.5 A-weighted decibel (dBA) increase could occur approximately 1.7 miles from the landing pad. The closest noise sensitive area (residential areas of Cape Canaveral) is approximately seven miles away. Therefore, Falcon landings would not exceed the FAA's noise significance threshold; that is, landings would not result in an increase in noise of day-night average noise level (DNL) 1.5 dBA or more at or above DNL 65 dBA noise exposure for the closest noise sensitive area.

The majority of the modeled sonic boom profile (refer to Figure 4-1 in the EA) occurs in the Atlantic Ocean. The modeling conducted for the EA predicted a maximum boom of 3 psf and occur more than 30 miles offshore. This modeling predicted that CCAFS and the Daytona Beach area may experience an overpressure of up to 1 psf, but generally about 0.4 psf or less.

After the USAF issued its final EA and FONSI, SpaceX and USAF refined the potential sonic boom analysis based on current vehicle and launch profile data. As a result, USAF determined that the overpressure values could be higher than those presented in the EA. The USAF predicts that the overpressure could range from 3-4 psf on-base and 2-3 psf off-base. Still, no significant adverse effects to the public or property from sonic booms are anticipated. SpaceX would notify the affected public in advance of a landing mission. Thus, the Proposed Action is not expected to result in significant impacts related to noise and compatible land use [EA 4.2 at 4-5, 4-6].

Section 4(f) Properties

No designated Section 4(f) properties, including public parks, recreation areas, or wildlife/waterfowl refuges, exist within the boundaries of CCAFS; therefore, no physical use or temporary occupancy of a Section 4(f) property would occur. Section 4(f) properties located within approximately a 15-mile radius of LC-1 include Merritt Island National Wildlife Refuge, Cape Canaveral National Seashore, Jetty Park, Kelly Park, Kars Park, Kings Park, and Manatee Cove Park. Additionally, the St. John's National Wildlife Refuge and Tosohatchee State Game Preserve are located west of the launch site. Due to their proximity to LC-1, these properties may

experience noise from proposed Falcon landings. Noise levels at these 4(f) properties may increase slightly and temporarily during a Falcon landing, but any impact would only last a few seconds and is expected to occur only once a month under the Proposed Action.

For decades, the 4(f) properties have been experiencing increased noise levels during launches taking place at CCAFS and adjacent Kennedy Space Center (KSC). Some of the launch vehicles (e.g., Space Shuttle and Titan IV) that have launched from CCAFS and KSC produced greater thrust and louder noise than would occur under a Falcon landing. Due to the long history of these Section 4(f) properties experiencing noise from launches at CCAFS and KSC, and because there is only one planned landing per month, the FAA has determined the Proposed Action would not substantially diminish the protected activities, features, or attributes of any of the Section 4(f) properties identified, and thus would not result in substantial impairment of the properties. Therefore, the Proposed Action would not be considered a constructive use of these Section 4(f) properties and would not invoke Section 4(f) of the Department of Transportation Act [EA 4.14 at 4-27].

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

Construction materials would be purchased within the region and would only contribute to a temporary, short-term beneficial impact to the economy. SpaceX would use its current workforce and also employ up to 50 additional temporary workers and local consultants for construction. The addition of these workers at CCAFS would not represent a significant increase in the population or growth rate of the region. During landing events and long-term operations, SpaceX would continue to use its current workforce. Landing operations would be expected to attract tourists who travel to the area specifically to view a landing event. Spending by tourists would generate revenue for local businesses, particularly in the hospitality industry, resulting in a small beneficial impact on the local economy.

Because operations would occur within CCAFS boundaries, and because most of the potential environmental impacts would occur at and within the vicinity of LC-1, the Proposed Action would not affect low-income or minority populations within the region. Similarly, the Proposed Action would have no high and disproportionate effects on children. Thus, the Proposed Action

is not expected to result in significant impacts related to socioeconomics, environmental justice, or children's environmental health and safety [EA 4.12 at 4-25; EA 4.13 at 4-26].

Transportation

Minor short-term interruptions to traffic flow or utilities may occur during construction activities. Since landing operations would occur approximately 12 times a year, on-base traffic near LC-1 would not change appreciably. Overall, launch viewing traffic per year has declined substantially since the Shuttle program was terminated in 2011. Traffic volume has increased for a Falcon launch but has been less than that of a Shuttle launch. There may be a slight increase in viewing traffic for a Falcon landing since it would be a novelty. Any increased visitation would cause less than a significant impact on CCAFS and local traffic patterns. There may be a slight positive impact on traffic since the Falcon vehicle would be transported to a local SpaceX facility for reuse rather than transporting a new Falcon first stage vehicle from Texas to CCAFS. Thus, the Proposed Action is not expected to result in significant impacts related to transportation [EA 4.9 at 4-23].

Water Resources (Wetlands, Floodplains, Water Quality, and Wild and Scenic Rivers)

Wetlands were surveyed and delineated south of the project site. Construction activities would avoid wetlands. Construction activities east of LC-1 would occur in the 100-year floodplain. Based on the expected adverse impacts on one of the natural and beneficial floodplain values (i.e., wildlife), the FAA has determined the Proposed Action would result in a floodplain encroachment per DOT Order 5650.2. The USAF formally consulted the USFWS per Section 7 of the Endangered Species Act to minimize potential impacts on federally listed species. The required site plan affords no other practicable alternative that would meet the requirements of the project. No significant impacts on wetlands or floodplains are expected [EA 4.7 at 4-21].

Under the Proposed Action, a typical deluge water system would not be used. Therefore, wastewater would not be generated by a Falcon landing. A stormwater management plan would be required for construction activities. The design would be developed, and an Environmental Resource Permit would be reviewed and approved by the St. Johns River Water Management

District (SJRWMD). Any stormwater runoff during construction would be managed according to a Stormwater Pollution Prevention Plan approved by the SJRWMD.

Potable water would be supplied by the existing water distribution systems at CCAFS and would not affect water quality. Portable "port-o-potties" would be placed on-site during landing operations. Any other wastewater would be processed through the existing wastewater collection and treatment systems at CCAFS and would not affect water quality.

There are no wild or scenic rivers present at or near CCAFS; thus, there would be no impact on wild and scenic rivers.

In summary, the Proposed Action is not expected to have a significant impact on water resources [EA 4.7 at 4-21].

CUMULATIVE IMPACTS

This FONSI incorporates by reference the EA, which addresses the potential impacts of past, present, and reasonably foreseeable future activities at and within the vicinity of CCAFS that would affect the resources impacted by the Proposed Action. Due to the nature of the Proposed Action and its location on the coast within CCAFS, only launch-related actions (construction and operation) occurring at CCAFS would meaningfully interact in time and space with the Proposed Action such that potential cumulative impacts could result. Past, present, and reasonably foreseeable actions near LC-1 include vehicle launches, landings, and construction activities, including land clearing. This section presents a brief summary of the potential cumulative environmental impacts considered in the EA, focusing on those resources with the greatest potential of experiencing cumulative impacts: air quality; biological resources (fish, wildlife, and plants); hazardous materials, pollution prevention, and solid waste; land use, farmlands, and coastal resources; light emissions and visual impacts; and noise and compatible land use.

Air Quality

The cumulative emissions from the Proposed Action and past, present, and reasonably foreseeable future projects at CCAFS would not exceed any thresholds established under the Clean Air Act or jeopardize the attainment status of the region. All government and commercial launches at CCAFS

occur individually, i.e., no launch overlaps in time or space with another launch. This avoids the potential for simultaneously combining impacts associated with exhaust plumes from multiple vehicles. Individuals at and around the launch sites are unlikely to be exposed to concentrations of any launch vehicle emission that exceeds the allowable public exposure limits adopted by the range safety organizations. Also, USAF's compliance with Executive Order 13514, *Federal Leadership in Environmental, Energy, and Economic Performance*, for activities taking place at CCAFS helps minimize emissions of GHGs. Therefore, no significant cumulative impacts to the region's air quality are expected to occur [EA 5.2 at 5-8].

Biological Resources (Fish, Wildlife, and Plants)

Potential cumulative impacts on biological resources from the Proposed Action and other past, present, and reasonably foreseeable future projects at CCAFS include those types of direct and indirect impacts discussed above. Cumulative adverse impacts would occur to the Florida scrub-jay and eastern indigo snake. When evaluated with other projects occurring or proposed at CCAFS, KSC, or the Port of Canaveral area, the proposed removal of approximately 48 acres of habitat would result in a reduction of available breeding habitat in the area, as well as a reduction in the availability of scrub-jay habitat for restoration. The restoration of approximately 100 acres of habitat (proposed mitigation for the Proposed Action) would result in habitat that could support an additional four scrub-jay territories.

Cumulative impacts on sea turtles have the potential to occur. Operations at LC-1 would result in more exterior lighting than is currently present in the area. Adherence to the Light Management Plan and USAF lighting policies is expected to help minimize these impacts.

Potential cumulative impacts on biological resources would be minimized with implementation of measures identified during consultation with the USFWS (as applicable for the Proposed Action), measures identified in environmental documents completed for other projects, measures to be incorporated in environmental documents currently under development for future actions, and measures identified in the USAF's Integrated Natural Resources Management Plan and Light Management Plan for CCAFS. Therefore, no significant cumulative impacts to biological resources are expected to occur [EA 5.2 at 5-8].

Hazardous Materials, Pollution Prevention, and Solid Waste

Launch operations and other activities conducted at CCAFS use products containing hazardous materials; however, implementation of existing handling and management procedures for hazardous materials, hazardous waste, and solid waste limits the potential for impacts. Each organization or entity conducting activities at CCAFS is responsible for compliance with applicable regulatory requirements (e.g., Resource Conservation and Recovery Act; Executive Order 12088, *Federal Compliance with Pollution Control Standards*). Therefore, significant cumulative impacts related to hazardous materials, pollution prevention, and solid waste are not expected to occur [EA 5.2 at 5-10].

Land Use, Farmlands, and Coastal Resources

The Proposed Action would not result in any significant impacts to land use compatibility because CCAFS and LC-1 current use includes launching space vehicles. The Proposed Action and other past, present, and reasonably foreseeable future projects are consistent with existing land use, the Base General Plan, and the USAF mission at CCAFS. The Proposed Action and other past, present, and future projects would not convert prime agricultural land to other uses. Thus, significant cumulative impacts to land use, farmlands, and coastal resources are not expected to occur [EA 5.2 at 5-6].

Light Emissions and Visual Impacts

The visual presence of the infrastructure associated with launches and other activities conducted at CCAFS is well established and considered part of the local landscape. Light emissions and impacts related to visual resources from launches conducted at CCAFS include fire created during engine ignition and visual contrails in the sky. These impacts would be short-term and temporary, and would not overlap in time or space. Therefore, significant cumulative impacts related to light emissions and visual resources are not expected to occur [EA 5.2 at 5-6].

Noise and Compatible Land Use

When combined with other past, present, and reasonably foreseeable future projects at CCAFS, short-term increases in noise levels in the area surrounding CCAFS from the Proposed Action are

not anticipated to be significant. Long-term cumulative noise levels would not be expected to exceed the FAA's noise significance threshold. Each launch at CCAFS would and has occurred separately, avoiding combined noise impacts from more than one launch at a time. Thus, significant cumulative impacts related to noise are not expected to occur [EA 5.2 at 5-7].

AGENCY FINDINGS: In accordance with applicable law, the FAA makes the following finding/determination based on the appropriate information and data contained in the EA:

- No significant environmental impacts would be incurred as a result of the FAA's Federal action.

After careful and thorough consideration of the facts contained herein, I find the proposed Federal action is consistent with existing national environmental policies and objectives as set forth in Section 101 of NEPA and other applicable environmental requirements and will not significantly affect the quality of the human environment or otherwise include any condition requiring consultation pursuant to Section 102(2)(c) of NEPA.

Issued in Washington, DC on: December 4, 2015

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