

DRAFT ENVIRONMENTAL IMPACT STATEMENT

SPACEX STARSHIP-SUPER HEAVY LAUNCH VEHICLE AT LAUNCH COMPLEX 39A

at the Kennedy Space Center, Merritt Island, Florida

Volume II, Appendix B.3, Part 2

August 2025



**Federal Aviation
Administration**

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Tribal Historic Preservation Officer and Consulting Party Correspondence

From: [Victoria Menchaca](#)
To: [Zeringue, Katherine S. \(KSC-SIE30\)](#)
Cc: [THPO Compliance; Long, Eva \(FAA\); Stacey.Zee@faa.gov; Amy.Hanson@faa.gov; Dankert, Donald J. \(KSC-SIE30\)](#)
Subject: [EXTERNAL] RE: Section 106 Consultation: SpaceX Starship Super Heavy Launch and Reentry Vehicles at Launch Complex-39A, Kennedy Space Center, Cape Canaveral, Florida
Date: Wednesday, January 8, 2025 2:58:31 PM
Attachments: [NASA FAA STOF Tribal Cons Pko Final.pdf](#)
[Enclosure 1 LC39A Infrastructure.pdf](#)
[Enclosure 2 Supplemental Information Technical Report.pdf](#)

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January 08, 2025

Katherine Zeringue
 Cultural Resources Manager
 John F. Kennedy Space Center
 Spaceport Integration & Services
 Environmental Management Branch, SI-E3
 Kennedy Space Center, FL 32899
 Phone: 321-867-8454
 Email: katherine.s.zeringue@nasa.gov

Subject: SpaceX Starship Super Heavy Launch and Reentry Vehicles at Launch Complex-39A, Kennedy Space Center, Cape Canaveral, Florida
 THPO Compliance Tracking Number: 0034641

In order to expedite the THPO review process:

1. Please correspond via email and provide documents as attachments,
2. Please send all emails to THPOCompliance@semtribe.com,
3. Please reference the THPO Compliance Tracking Number if one has been assigned.

Dear Katherine Zeringue,

Thank you for contacting the Seminole Tribe of Florida Tribal Historic Preservation Office (STOF THPO) Compliance Section regarding the SpaceX Starship Super Heavy Launch and Reentry Vehicles at Launch Complex-39A, Kennedy Space Center, Cape Canaveral, Florida.

The proposed undertaking does fall within the STOF Area of Interest. We have reviewed the documents that you

provided pursuant to Section 106 of the National Historic Preservation Act (16 USC 470) as amended and its implementing regulations (36 CFR 800). For us to complete our review we would like to respectfully request the following additional information:

- A copy of the report below that is referenced in SEARCH's 2024 Technical Memorandum (Enclosure 2: Supplemental Information Technical Report):
 - 2021 Nocerino, Eric S., Josh Smallwood, and Edward B. Yarborough
 Rocket Engine Noise Effects on Cultural Resources: Addendum to the Section 106 Compliance Report for the Blue Origin Orbital Launch Site Project, Vandenberg Space Force Base, Santa Barbara, California. Prepared by Applied Earth Works, Inc. for Tetra Tech, November 2021.

We look forward to the delivery of the additional information requested. Please continue to consult with our office and feel free to contact us with any questions or concerns.

Sincerely,

Victoria L. Menchaca, MA, Compliance Analyst II
 STOF THPO, Compliance Section
 Phone: 863-458-8195
 Email: victoriamentchaca@semtribe.com

From: Zeringue, Katherine S. (KSC-SIE30) <katherine.s.zeringue@nasa.gov>
Sent: Friday, December 20, 2024 4:48 PM
To: Chairman <Chairman@semtribe.com>
Cc: THPO Compliance <THPOCompliance@semtribe.com>; Danielle Simon <daniellesimon@semtribe.com>; Long, Eva (FAA) <Eva.Long@faa.gov>; Zee, Stacey (FAA) <Stacey.Zee@faa.gov>; Hanson, Amy (FAA) <Amy.Hanson@faa.gov>; Dankert, Donald J. (KSC-SIE30) <donald.j.dankert@nasa.gov>
Subject: Section 106 Consultation: SpaceX Starship Super Heavy Launch and Reentry Vehicles at Launch Complex-39A, Kennedy Space Center, Cape Canaveral, Florida

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Dear Chairman Osceola,

The purpose of this letter is to initiate consultation under Section 106 of the National Historic Preservation Act of 1966 (NHPA) and to invite the Seminole Tribe of Florida to participate as a Consulting Party.

The National Aeronautics and Space Administration's Kennedy Space Center (NASA KSC) is initiating consultation with your office as part of the Federal Aviation Administration's (FAA) environmental review of the proposed action for the SpaceX Starship Super Heavy launch and reentry vehicles at Launch Complex-39A (LC-39A). While NASA is leading Section 106 consultation, the FAA is leading Government to Government consultation which will be covered in a separate letter sent from the FAA. Under the supervision of the FAA's Office of Commercial Space Transportation, SpaceX is preparing an Environmental Impact Statement (EIS) to evaluate the potential impacts of proposed infrastructure construction, and ground, launch, and reentry operations associated with the Starship Super Heavy launch and reentry vehicles at LC-39A. Because SpaceX plans to apply to the FAA's Office of Commercial Space Transportation for a vehicle operator license for Starship Super Heavy, the EIS will conform to the FAA's National Environmental Policy Act (NEPA) implementing policy, FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*, regarding the potential infrastructure construction, ground operations, launch, and reentry-

related impacts.

Description of the Undertaking

The undertaking involves issuance of a vehicle operator license by the FAA's Office of Commercial Space Transportation that will facilitate ground, launch, and reentry operations associated with the SpaceX Starship Super Heavy at LC-39A. Specifically, this would include up to 44 launches of Starship Super Heavy per year; return of the first stage booster to LC-39A; return of Starship to LC-39A; and construction of an air separation unit for liquid oxygen and liquid nitrogen, onsite natural gas liquefaction production and cryogenic liquid storage capability, roadway improvements, other associated infrastructure, and a catch tower (see **Enclosure 1**). Additional information is available on FAA's project website at: https://www.faa.gov/space/stakeholder_engagement/spacex_starship_ksc/.

Area of Potential Effects

The area of potential effects (APE) considers any physical, visual, or auditory effects that the project may have on historic properties^[1]. As such, the APE has been developed to consider both a construction APE and an operational APE. The construction APE is limited within the existing boundaries of LC-39A. Additionally, it is anticipated that proposed new construction associated with the operation of the Starship Super Heavy will be compatible with the characteristic of other launch complex infrastructure and will not pose viewshed effects to historic properties. The operational APE considers the auditory effects of the Starship Super Heavy launch activity as well as the overpressure effects of the sonic boom generated during atmospheric reentry. FAA guidance stipulates consideration of a 130 decibel (dB) threshold for launch effects and a 2.0 pounds per square foot (psf) threshold for effects from the sonic boom. Based on this information, and previous research regarding rocket engine noise and vibration effects to structures, the APE was established as any area subjected to greater than or equal to 2.0 psf sonic booms (see **Enclosure 2, Figure 2**). This area also encompasses the 130 dB threshold for launch effects, as well as the construction APE.

Initial Identification of Historic Properties and Proposed Identification Efforts

The proposed identification approach is designed to make a reasonable and good faith effort to identify historic properties within the APE that may be affected by the undertaking. Effects related to construction will be limited within the footprint of LC-39A. This area has already been subject to survey and evaluation and will not require additional studies. The fieldwork and analysis will therefore focus on historic properties subject to the potential effects of elevated noise and vibrations associated with the undertaking.

The undertaking has the potential to affect historic properties from increased vibratory impacts. According to data provided by SpaceX, launch and reentry events are estimated to result in Lmax levels of 130 dB and/or sonic boom impacts of 2 psf or higher within the APE. Archaeological resources consisting solely of either surface scatters or subsurface deposits are not likely to be affected by the vibratory effects of increased sonic boom exposure due to the protective qualities of the surrounding soil matrix. Similarly, underwater archaeological sites are unlikely to be affected. However, vibratory effects may be greater on historic age resources within the built environment. Architectural elements most susceptible to damage from launch and reentry vehicle noise include windows and, infrequently, plastered walls and ceilings. Vibration effects may be greatest to non-structural elements such as fragile glass and loose plaster/stone ornamentation. The enclosed memorandum provides additional information on this summation of the potential for vibratory effects on cultural resources (see **Enclosure 2**).

Previously Recorded Resources Within the APE

Historic properties within the construction APE include the Launch Complex 39 Pad A Historic District

(**8BR1686**) which is listed in the National Register of Historic Places (NRHP). The historic district is the first of two launch pads constructed by NASA in the 1960s to accommodate the Saturn V launch vehicle for Apollo missions and modified in the 1970s to accommodate the Space Shuttle Program. The historic district contains 23 extant contributing resources all used to support launch operations. One contributing resource, Launch Complex 39 Pad A (**8BR1995**), is also individually listed in the NRHP. No archaeological sites have been recorded or documented within LC-39A.

A preliminary assessment of the operational APE, using data contained in the Florida Master Site File (FMSF), identified 2,964 previously recorded resources, including 2,315 structures, 31 bridges, 465 archaeological sites, 31 cemeteries, and 122 resource groups. Of these, 35 properties are listed in the NRHP and 353 have been evaluated as eligible (see **Enclosure 2**).

Approach for the Identification of Historic Properties

In 2010, NASA KSC completed HAER documentation of the LC-39A historic district and its associated contributing resources. As such, LC-39A is well documented and no further identification or evaluation of LC-39A is proposed.

Identification efforts will focus on historic properties that may be subject to physical damage from elevated noise and vibrations as well as cultural resources whose setting and feeling may be affected by audible and acoustic effects during launch and reentry activities. This will include buildings and structures within the APE that were not specifically designed to withstand the concussive forces of launching and landing spacecraft. Additionally, there are specific types of cultural resources for which aspects of setting and feeling are more likely to represent important components of historic integrity. These types of cultural resources potentially include:

- Designed historic landscapes such as parks and gardens
- Rural historic landscapes with continuity in their traditional use (farming, hunting/fishing, sports/recreation)
- Historic districts
- Historic sites that feature outdoor spaces such as yards and plazas
- Cemeteries

Since the universe of properties in the APE will include many thousands of buildings and structures, identification efforts will focus on properties greater than 45 years of age, in areas that have not been surveyed within the last 10 years, and limited to historic properties and potential historic properties that may reasonably be affected by the undertaking. Previously recorded resources that were determined ineligible for listing in the NRHP will be excluded from further identification and evaluation efforts.

Historic properties will be identified in two ways. First, NASA KSC, supported by SEARCH, will compile an inventory of previously recorded cultural resources within the APE that are listed, eligible for listing, potentially eligible for listing, and unevaluated for listing in the NRHP. NASA KSC will use the FMSF database as well as the Integrated Cultural Resource Management Plans from both KSC and the Cape Canaveral Space Force Station. Additionally, county property appraiser databases will be queried to identify unrecorded historic aboveground resources within the APE. Parcel data contains built year information, which can be cross-referenced with recorded resources to identify parcels that contain structures 45 years old or older without recorded resources. Historic maps and aerial photographs will be used to examine land use and development changes over time, and a historic

context will be developed for the APE. Data will be further supplemented with information on unrecorded cultural resources provided by consulting parties and the public. The cumulative data will be used to develop a Geographic Information System heat map within the APE to identify areas with high concentrations of unrecorded structures that are 45 years old or older. These data sets will be used to identify and create a list of properties that will be subject to survey fieldwork. The preliminary inventory data are provided in Enclosure 2.

Second, fieldwork will be conducted with three primary objectives:

1. Conduct a windshield survey guided by the heat map discussed above, in order to identify potential historic properties.
2. Complete FMSF documentation for potential historic properties identified during the windshield survey that have a reasonable possibility to be adversely affected by the undertaking. The architectural historians will identify and photograph potential historic properties that appear to embody historic significance established in the historic context. They will also identify and document the character-defining features that are indicative of NRHP eligibility and that may be susceptible to adverse effects, as discussed in Section 1.2. All newly recorded resources will be assumed NRHP-eligible, for the purposes of Section 106 consultation.
3. Revisit NRHP-listed or eligible historic properties that are individually eligible for the NRHP and that have with a reasonable possibility to be adversely affected to reassess their integrity.

A technical report presenting the results of the identification of historic properties will be prepared and submitted to you for review.

Consultation

Please let me know if your Tribe would like to participate as a Consulting Party in the Section 106 process and if there are properties of religious or cultural importance to your Tribe within the Project Area. Early identification of Tribal concerns will allow NASA and FAA to consider ways to avoid and minimize potential impacts to Tribal resources and practices. Your timely response will greatly assist us in incorporating your comments into project planning.

If you have any questions or need further information on the project, please contact me at 321-867-8454 or via email at katherine.s.zeringue@nasa.gov.

Sincerely,
Katherine Zeringue
Cultural Resources Manager
John F. Kennedy Space Center
Spaceport Integration & Services
Environmental Management Branch, SI-E3
Kennedy Space Center, FL 32899
321-867-8454



^[1] Historic property means any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places maintained by the Secretary of the Interior. This term includes artifacts, records, and remains that are related to and located within such properties. The term includes properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization and that meet the National Register criteria. 36 CFR 800.16(l)(1)

From: [Zeringue, Katherine S. \(KSC-SIE30\)](#)
To: [THPO Compliance](#)
Cc: [Long, Eva \(FAA\); Hanson, Amy \(FAA\)](#)
Subject: THPO Compliance Tracking Number: 0034641: Section 106 Consultation: SpaceX Starship Super Heavy Launch and Reentry Vehicles at Launch Complex-39A, Kennedy Space Center, Cape Canaveral, Florida
Date: Friday, January 10, 2025 9:13:00 AM
Attachments: [Applied EarthWorks' Blue Origin Noise Report.pdf](#)

Good Morning,

As requested, attached is a copy of the report referenced in SEARCH's 2024 Technical Memorandum (Enclosure 2: Supplemental Information Technical Report) :

- o 2021 Nocerino, Eric S., Josh Smallwood, and Edward B. Yarborough
Rocket Engine Noise Effects on Cultural Resources: Addendum to the Section 106 Compliance Report for the Blue Origin Orbital Launch Site Project, Vandenberg Space Force Base, Santa Barbara, California. Prepared by Applied Earth Works, Inc. for Tetra Tech, November 2021.

If there is anything else I can provide to assist in your understanding or review of the project, please let me know.

Sincerely,
Katherine Zeringue
Cultural Resources Manager
John F. Kennedy Space Center
Spaceport Integration & Services
Environmental Management Branch, SI-E3
Kennedy Space Center, FL 32899
321-867-8454



From: Victoria Menchaca <VictoriaMenchaca@semtribe.com>
Sent: Wednesday, January 8, 2025 2:57 PM
To: Zeringue, Katherine S. (KSC-SIE30) <katherine.s.zeringue@nasa.gov>
Cc: THPO Compliance <THPOCompliance@semtribe.com>; Long, Eva (FAA) <Eva.Long@faa.gov>; Stacey.Zee@faa.gov; Amy.Hanson@faa.gov; Dankert, Donald J. (KSC-SIE30) <donald.j.dankert@nasa.gov>
Subject: [EXTERNAL] RE: Section 106 Consultation: SpaceX Starship Super Heavy Launch and Reentry Vehicles at Launch Complex-39A, Kennedy Space Center, Cape Canaveral, Florida

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January 08, 2025

Katherine Zeringue
Cultural Resources Manager
John F. Kennedy Space Center
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Kennedy Space Center, FL 32899
Phone: 321-867-8454
Email: katherine.s.zeringue@nasa.gov

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Victoria L. Menchaca, MA, Compliance Analyst II
STOF THPO, Compliance Section
Phone: 863-458-8195
Email: victoriamentchaca@semttribe.com

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Sent: Friday, December 20, 2024 4:48 PM
To: Chairman <Chairman@semttribe.com>
Cc: THPO Compliance <THPOCompliance@semttribe.com>; Danielle Simon <daniellesimon@semttribe.com>; Long, Eva (FAA) <Eva.Long@faa.gov>; Zee, Stacey (FAA) <Stacey.Zee@faa.gov>; Hanson, Amy (FAA) <Amy.Hanson@faa.gov>; Dankert, Donald J. (KSC-SIE30) <donald.j.dankert@nasa.gov>
Subject: Section 106 Consultation: SpaceX Starship Super Heavy Launch and Reentry Vehicles at Launch Complex-39A, Kennedy Space Center, Cape Canaveral, Florida

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If you have any questions or need further information on the project, please contact me at 321-867-8454 or via email at katherine.s.zeringue@nasa.gov.

Sincerely,
Katherine Zeringue
Cultural Resources Manager
John F. Kennedy Space Center
Spaceport Integration & Services
Environmental Management Branch, SI-E3
Kennedy Space Center, FL 32899
321-867-8454



^[1] Historic property means any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places maintained by the Secretary of the Interior. This term includes artifacts, records, and remains that are related to and located within such properties. The term includes properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization and that meet the National Register criteria. 36 CFR 800.16(l)(1)

From: [Victoria Menchaca](#)
To: [Zeringue, Katherine S. \(KSC-STF30\)](#)
Cc: [Long, Eva \(FAA\)](#); [Amy.Hanson@faa.gov](#); [THPO Compliance](#)
Subject: [EXTERNAL] RE: THPO Compliance Tracking Number: 0034641: Section 106 Consultation: SpaceX Starship Super Heavy Launch and Reentry Vehicles at Launch Complex-39A, Kennedy Space Center, Cape Canaveral, Florida
Date: Thursday, January 30, 2025 4:19:50 PM

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NAOMI R. WILSON
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January 30, 2025

Katherine Zeringue
Cultural Resources Manager
John F. Kennedy Space Center
Spaceport Integration & Services
Environmental Management Branch, SI-E3
Kennedy Space Center, FL 32899
Phone: 321-867-8454
Email: katherine.s.zeringue@nasa.gov

Subject: SpaceX Starship Super Heavy Launch and Reentry Vehicles at Launch Complex-39A, Kennedy Space Center, Cape Canaveral, Florida
THPO Compliance Tracking Number: 0034641

In order to expedite the THPO review process:

1. Please correspond via email and provide documents as attachments,
2. Please send all emails to THPOCompliance@semtribe.com,
3. Please reference the THPO Compliance Tracking Number if one has been assigned.

Dear Katherine Zeringue:

Thank you for contacting the Seminole Tribe of Florida Tribal Historic Preservation Office (STOF THPO) Compliance Section regarding the SpaceX Starship Super Heavy Launch and Reentry Vehicles at Launch Complex-39A, Kennedy Space Center, Cape Canaveral, Florida.

The proposed undertaking does fall within the STOF Area of Interest. Therefore, we would like to accept your invitation to consult on this project pursuant to Section 106 of the National Historic Preservation Act (16 USC 470) as amended and its implementing regulations (36 CFR 800). Our preferred methods of engagement are written correspondence and

supplemental virtual and/or in-person Government-to-Government consultations. It is our hope that any formal engagement with our office will facilitate meaningful discussion and integrate Indigenous Traditional Ecological Knowledge (ITEK), and general comments, into project design/implementation.

Written notifications/correspondences should be submitted to THPOCompliance@semtribe.com and the following contacts/STOF personnel:

- Danielle Simon (DanielleSimon@semtribe.com), THPO Compliance Manager
- Victoria Menchaca (VictoriaMenchaca@semtribe.com), THPO Compliance Analyst II

Please continue to consult with our office and feel free to contact us with any questions or concerns.

Sincerely,
Victoria L. Menchaca, MA, Compliance Analyst II
STOF THPO, Compliance Section
Phone: 863-458-8195
Email: victoriamentchaca@semtribe.com

From: Zeringue, Katherine S. (KSC-SIE30) <katherine.s.zeringue@nasa.gov>
Sent: Friday, January 10, 2025 9:13 AM
To: THPO Compliance <THPOCompliance@semtribe.com>
Cc: Long, Eva (FAA) <Eva.Long@faa.gov>; Hanson, Amy (FAA) <Amy.Hanson@faa.gov>
Subject: THPO Compliance Tracking Number: 0034641: Section 106 Consultation: SpaceX Starship Super Heavy Launch and Reentry Vehicles at Launch Complex-39A, Kennedy Space Center, Cape Canaveral, Florida

CAUTION: This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Good Morning,

As requested, attached is a copy of the report referenced in SEARCH's 2024 Technical Memorandum (Enclosure 2: Supplemental Information Technical Report) :

- 2021 Nocerino, Eric S., Josh Smallwood, and Edward B. Yarborough
Rocket Engine Noise Effects on Cultural Resources: Addendum to the Section 106 Compliance Report for the Blue Origin Orbital Launch Site Project, Vandenberg Space Force Base, Santa Barbara, California. Prepared by Applied Earth Works, Inc. for Tetra Tech, November 2021.

If there is anything else I can provide to assist in your understanding or review of the project, please let me know.

Sincerely,
Katherine Zeringue
Cultural Resources Manager
John F. Kennedy Space Center
Spaceport Integration & Services
Environmental Management Branch, SI-E3
Kennedy Space Center, FL 32899
321-867-8454



From: Victoria Menchaca <VictoriaMenchaca@semtribe.com>
Sent: Wednesday, January 8, 2025 2:57 PM
To: Zeringue, Katherine S. (KSC-SIE30) <katherine.s.zeringue@nasa.gov>
Cc: THPO Compliance <THPOCompliance@semtribe.com>; Long, Eva (FAA) <Eva.Long@faa.gov>;
Stacey.Zee@faa.gov; Amy.Hanson@faa.gov; Dankert, Donald J. (KSC-SIE30) <donald.j.dankert@nasa.gov>
Subject: [EXTERNAL] RE: Section 106 Consultation: SpaceX Starship Super Heavy Launch and Reentry Vehicles at Launch Complex-39A, Kennedy Space Center, Cape Canaveral, Florida

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SEMINOLE TRIBE OF FLORIDA TRIBAL HISTORIC PRESERVATION OFFICE

SEMINOLE TRIBE OF FLORIDA

TRIBAL HISTORIC
PRESERVATION OFFICE

THPO PHONE: (863) 983-6549

THPO TRIBAL CONSULTATION EMAIL:
THPOCOMPLIANCE@SEMTRIBE.COM

THPO WEBSITE: WWW.STOFTHPO.COM



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CHAIRMAN

HOLLY TIGER
VICE CHAIRWOMAN

NAOMI R. WILSON
SECRETARY

PETER A. HAHN
TREASURER

January 08, 2025

Katherine Zeringue
Cultural Resources Manager
John F. Kennedy Space Center
Spaceport Integration & Services
Environmental Management Branch, SI-E3
Kennedy Space Center, FL 32899
Phone: 321-867-8454
Email: katherine.s.zeringue@nasa.gov

Subject: SpaceX Starship Super Heavy Launch and Reentry Vehicles at Launch Complex-39A, Kennedy Space Center, Cape Canaveral, Florida
 THPO Compliance Tracking Number: 0034641

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3. Please reference the THPO Compliance Tracking Number if one has been assigned.

Dear Katherine Zeringue,

Thank you for contacting the Seminole Tribe of Florida Tribal Historic Preservation Office (STOF THPO) Compliance Section regarding the SpaceX Starship Super Heavy Launch and Reentry Vehicles at Launch Complex-39A, Kennedy Space Center, Cape Canaveral, Florida.

The proposed undertaking does fall within the STOF Area of Interest. We have reviewed the documents that you provided pursuant to Section 106 of the National Historic Preservation Act (16 USC 470) as amended and its implementing regulations (36 CFR 800). For us to complete our review we would like to respectfully request the following additional information:

- A copy of the report below that is referenced in SEARCH's 2024 Technical Memorandum (Enclosure 2: Supplemental Information Technical Report) :
 - 2021 Nocerino, Eric S., Josh Smallwood, and Edward B. Yarborough
 Rocket Engine Noise Effects on Cultural Resources: Addendum to the Section 106 Compliance Report for the Blue Origin Orbital Launch Site Project, Vandenberg Space Force Base, Santa Barbara, California. Prepared by Applied Earth Works, Inc. for Tetra Tech, November 2021.

We look forward to the delivery of the additional information requested. Please continue to consult with our office and feel free to contact us with any questions or concerns.

Sincerely,

Victoria L. Menchaca, MA, Compliance Analyst II
 STOF THPO, Compliance Section
 Phone: 863-458-8195
 Email: victoriamenchaca@semtribe.com

From: Zeringue, Katherine S. (KSC-SIE30) <katherine.s.zeringue@nasa.gov>
Sent: Friday, December 20, 2024 4:48 PM
To: Chairman <Chairman@semtribe.com>
Cc: THPO Compliance <THPOCompliance@semtribe.com>; Danielle Simon <daniellesimon@semtribe.com>; Long, Eva (FAA) <Eva.Long@faa.gov>; Zee, Stacey (FAA) <Stacey.Zee@faa.gov>; Hanson, Amy (FAA) <Amy.Hanson@faa.gov>; Dankert, Donald J. (KSC-SIE30) <donald.j.dankert@nasa.gov>
Subject: Section 106 Consultation: SpaceX Starship Super Heavy Launch and Reentry Vehicles at Launch Complex-39A, Kennedy Space Center, Cape Canaveral, Florida

CAUTION: This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Dear Chairman Osceola,

The purpose of this letter is to initiate consultation under Section 106 of the National Historic Preservation Act of 1966 (NHPA) and to invite the Seminole Tribe of Florida to participate as a Consulting Party.

The National Aeronautics and Space Administration's Kennedy Space Center (NASA KSC) is initiating consultation with your office as part of the Federal Aviation Administration's (FAA) environmental review of the proposed action for the SpaceX Starship Super Heavy launch and reentry vehicles at Launch Complex-39A (LC-39A). While NASA is leading Section 106 consultation, the FAA is leading Government to

Government consultation which will be covered in a separate letter sent from the FAA. Under the supervision of the FAA's Office of Commercial Space Transportation, SpaceX is preparing an Environmental Impact Statement (EIS) to evaluate the potential impacts of proposed infrastructure construction, and ground, launch, and reentry operations associated with the Starship Super Heavy launch and reentry vehicles at LC-39A. Because SpaceX plans to apply to the FAA's Office of Commercial Space Transportation for a vehicle operator license for Starship Super Heavy, the EIS will conform to the FAA's National Environmental Policy Act (NEPA) implementing policy, FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*, regarding the potential infrastructure construction, ground operations, launch, and reentry-related impacts.

Description of the Undertaking

The undertaking involves issuance of a vehicle operator license by the FAA's Office of Commercial Space Transportation that will facilitate ground, launch, and reentry operations associated with the SpaceX Starship Super Heavy at LC-39A. Specifically, this would include up to 44 launches of Starship Super Heavy per year; return of the first stage booster to LC-39A; return of Starship to LC-39A; and construction of an air separation unit for liquid oxygen and liquid nitrogen, onsite natural gas liquefaction production and cryogenic liquid storage capability, roadway improvements, other associated infrastructure, and a catch tower (see **Enclosure 1**). Additional information is available on FAA's project website at: https://www.faa.gov/space/stakeholder_engagement/spacex_starship_ksc/.

Area of Potential Effects

The area of potential effects (APE) considers any physical, visual, or auditory effects that the project may have on historic properties^[1]. As such, the APE has been developed to consider both a construction APE and an operational APE. The construction APE is limited within the existing boundaries of LC-39A. Additionally, it is anticipated that proposed new construction associated with the operation of the Starship Super Heavy will be compatible with the characteristic of other launch complex infrastructure and will not pose viewshed effects to historic properties. The operational APE considers the auditory effects of the Starship Super Heavy launch activity as well as the overpressure effects of the sonic boom generated during atmospheric reentry. FAA guidance stipulates consideration of a 130 decibel (dB) threshold for launch effects and a 2.0 pounds per square foot (psf) threshold for effects from the sonic boom. Based on this information, and previous research regarding rocket engine noise and vibration effects to structures, the APE was established as any area subjected to greater than or equal to 2.0 psf sonic booms (see **Enclosure 2, Figure 2**). This area also encompasses the 130 dB threshold for launch effects, as well as the construction APE.

Initial Identification of Historic Properties and Proposed Identification Efforts

The proposed identification approach is designed to make a reasonable and good faith effort to identify historic properties within the APE that may be affected by the undertaking. Effects related to construction will be limited within the footprint of LC-39A. This area has already been subject to survey and evaluation and will not require additional studies. The fieldwork and analysis will therefore focus on historic properties subject to the potential effects of elevated noise and vibrations associated with the undertaking.

The undertaking has the potential to affect historic properties from increased vibratory impacts. According to data provided by SpaceX, launch and reentry events are estimated to result in Lmax levels of 130 dB and/or sonic boom impacts of 2 psf or higher within the APE. Archaeological resources consisting solely of either surface scatters or subsurface deposits are not likely to be affected by the vibratory effects of increased sonic boom exposure due to the protective qualities of the surrounding soil matrix. Similarly, underwater archaeological sites are unlikely to be affected. However, vibratory effects may be greater on

historic age resources within the built environment. Architectural elements most susceptible to damage from launch and reentry vehicle noise include windows and, infrequently, plastered walls and ceilings. Vibration effects may be greatest to non-structural elements such as fragile glass and loose plaster/stone ornamentation. The enclosed memorandum provides additional information on this summation of the potential for vibratory effects on cultural resources (see **Enclosure 2**).

Previously Recorded Resources Within the APE

Historic properties within the construction APE include the Launch Complex 39 Pad A Historic District (**8BR1686**) which is listed in the National Register of Historic Places (NRHP). The historic district is the first of two launch pads constructed by NASA in the 1960s to accommodate the Saturn V launch vehicle for Apollo missions and modified in the 1970s to accommodate the Space Shuttle Program. The historic district contains 23 extant contributing resources all used to support launch operations. One contributing resource, Launch Complex 39 Pad A (**8BR1995**), is also individually listed in the NRHP. No archaeological sites have been recorded or documented within LC-39A.

A preliminary assessment of the operational APE, using data contained in the Florida Master Site File (FMSF), identified 2,964 previously recorded resources, including 2,315 structures, 31 bridges, 465 archaeological sites, 31 cemeteries, and 122 resource groups. Of these, 35 properties are listed in the NRHP and 353 have been evaluated as eligible (see **Enclosure 2**).

Approach for the Identification of Historic Properties

In 2010, NASA KSC completed HAER documentation of the LC-39A historic district and its associated contributing resources. As such, LC-39A is well documented and no further identification or evaluation of LC-39A is proposed.

Identification efforts will focus on historic properties that may be subject to physical damage from elevated noise and vibrations as well as cultural resources whose setting and feeling may be affected by audible and acoustic effects during launch and reentry activities. This will include buildings and structures within the APE that were not specifically designed to withstand the concussive forces of launching and landing spacecraft. Additionally, there are specific types of cultural resources for which aspects of setting and feeling are more likely to represent important components of historic integrity. These types of cultural resources potentially include:

- Designed historic landscapes such as parks and gardens
- Rural historic landscapes with continuity in their traditional use (farming, hunting/fishing, sports/recreation)
- Historic districts
- Historic sites that feature outdoor spaces such as yards and plazas
- Cemeteries

Since the universe of properties in the APE will include many thousands of buildings and structures, identification efforts will focus on properties greater than 45 years of age, in areas that have not been surveyed within the last 10 years, and limited to historic properties and potential historic properties that may reasonably be affected by the undertaking. Previously recorded resources that were determined ineligible for listing in the NRHP will be excluded from further identification and evaluation efforts.

Historic properties will be identified in two ways. First, NASA KSC, supported by SEARCH, will compile an inventory of previously recorded cultural resources within the APE that are listed, eligible for

listing, potentially eligible for listing, and unevaluated for listing in the NRHP. NASA KSC will use the FMSF database as well as the Integrated Cultural Resource Management Plans from both KSC and the Cape Canaveral Space Force Station. Additionally, county property appraiser databases will be queried to identify unrecorded historic aboveground resources within the APE. Parcel data contains built year information, which can be cross-referenced with recorded resources to identify parcels that contain structures 45 years old or older without recorded resources. Historic maps and aerial photographs will be used to examine land use and development changes over time, and a historic context will be developed for the APE. Data will be further supplemented with information on unrecorded cultural resources provided by consulting parties and the public. The cumulative data will be used to develop a Geographic Information System heat map within the APE to identify areas with high concentrations of unrecorded structures that are 45 years old or older. These data sets will be used to identify and create a list of properties that will be subject to survey fieldwork. The preliminary inventory data are provided in Enclosure 2.

Second, fieldwork will be conducted with three primary objectives:

1. Conduct a windshield survey guided by the heat map discussed above, in order to identify potential historic properties.
2. Complete FMSF documentation for potential historic properties identified during the windshield survey that have a reasonable possibility to be adversely affected by the undertaking. The architectural historians will identify and photograph potential historic properties that appear to embody historic significance established in the historic context. They will also identify and document the character-defining features that are indicative of NRHP eligibility and that may be susceptible to adverse effects, as discussed in Section 1.2. All newly recorded resources will be assumed NRHP-eligible, for the purposes of Section 106 consultation.
3. Revisit NRHP-listed or eligible historic properties that are individually eligible for the NRHP and that have with a reasonable possibility to be adversely affected to reassess their integrity.

A technical report presenting the results of the identification of historic properties will be prepared and submitted to you for review.

Consultation

Please let me know if your Tribe would like to participate as a Consulting Party in the Section 106 process and if there are properties of religious or cultural importance to your Tribe within the Project Area. Early identification of Tribal concerns will allow NASA and FAA to consider ways to avoid and minimize potential impacts to Tribal resources and practices. Your timely response will greatly assist us in incorporating your comments into project planning.

If you have any questions or need further information on the project, please contact me at 321-867-8454 or via email at katherine.s.zeringue@nasa.gov.

Sincerely,
Katherine Zeringue

Cultural Resources Manager
John F. Kennedy Space Center
Spaceport Integration & Services
Environmental Management Branch, SI-E3
Kennedy Space Center, FL 32899
321-867-8454



^[1] Historic property means any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places maintained by the Secretary of the Interior. This term includes artifacts, records, and remains that are related to and located within such properties. The term includes properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization and that meet the National Register criteria. 36 CFR 800.16(l)(1)

From: [Jeffery Harjo](#)
To: [Zeringue, Katherine S. \(KSC-SIE30\)](#)
Subject: [EXTERNAL] Re: Section 106 Consultation: SpaceX Starship Super Heavy Launch and Reentry Vehicles at Launch Complex-39A, Kennedy Space Center, Cape Canaveral, Florida
Date: Friday, January 17, 2025 3:43:50 PM

I remember reading the documents and am glad you jogged my memory. I am looking forward to our visit.

Thank you,

Jeff Harjo, BA
Director, Historic Preservation Office
Seminole Nation of Oklahoma
PO Box 1498
Wewoka, OK 74884-1498

Office: 405.648.5996
Mobile: 405.788.5913

From: Zeringue, Katherine S. (KSC-SIE30) <katherine.s.zeringue@nasa.gov>
Sent: Friday, January 17, 2025 2:21 PM
To: Jeffery Harjo <harjo.je@sno-nsn.gov>
Cc: Zee, Stacey (FAA) <Stacey.Zee@faa.gov>; Hanson, Amy (FAA) <Amy.Hanson@faa.gov>; Long, Eva (FAA) <Eva.Long@faa.gov>
Subject: Section 106 Consultation: SpaceX Starship Super Heavy Launch and Reentry Vehicles at Launch Complex-39A, Kennedy Space Center, Cape Canaveral, Florida

Good Afternoon Mr. Harjo,

Thank you for speaking with me this afternoon. As discussed, below and attached are materials sent to the Seminole Nation of Oklahoma recently. I look forward to your visit on January 31, 2025. In the meantime, if you have any questions, please let me know.

Sincerely,
Katherine Zeringue
Cultural Resources Manager
John F. Kennedy Space Center
Spaceport Integration & Services
Environmental Management Branch, SI-E3
Kennedy Space Center, FL 32899
321-867-8454



From: Zeringue, Katherine S. (KSC-SIE30)
Sent: Friday, December 20, 2024 4:55 PM
To: chief@sno-nsn.gov
Cc: yahola.b@sno-nsn.gov; Zee, Stacey (FAA) <Stacey.Zee@faa.gov>; Hanson, Amy (FAA) <Amy.Hanson@faa.gov>; Long, Eva (FAA) <Eva.Long@faa.gov>; Dankert, Donald J. (KSC-SIE 30) <donald.j.dankert@nasa.gov>
Subject: Section 106 Consultation: SpaceX Starship Super Heavy Launch and Reentry Vehicles at Launch Complex-39A, Kennedy Space Center, Cape Canaveral, Florida

Dear Chief Johnson,

The purpose of this letter is to initiate consultation under Section 106 of the National Historic Preservation Act of 1966 (NHPA) and to invite the Seminole Nation of Oklahoma to participate as a Consulting Party.

The National Aeronautics and Space Administration's Kennedy Space Center (NASA KSC) is initiating consultation with your office as part of the Federal Aviation Administration's (FAA) environmental review of the proposed action for the SpaceX Starship Super Heavy launch and reentry vehicles at Launch Complex-39A (LC-39A). While NASA is leading Section 106 consultation, the FAA is leading Government to Government consultation which will be covered in a separate letter sent from the FAA. Under the supervision of the FAA's Office of Commercial Space Transportation, SpaceX is preparing an Environmental Impact Statement (EIS) to evaluate the potential impacts of proposed infrastructure construction, and ground, launch, and reentry operations associated with the Starship Super Heavy launch and reentry vehicles at LC-39A. Because SpaceX plans to apply to the FAA's Office of Commercial Space Transportation for a vehicle operator license for Starship Super Heavy, the EIS will conform to the FAA's National Environmental Policy Act (NEPA) implementing policy, FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*, regarding the potential infrastructure construction, ground operations, launch, and reentry-related impacts.

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Geographic Information System heat map within the APE to identify areas with high concentrations of unrecorded structures that are 45 years old or older. These data sets will be used to identify and create a list of properties that will be subject to survey fieldwork. The preliminary inventory data are provided in Enclosure 2.

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3. Revisit NRHP-listed or eligible historic properties that are individually eligible for the NRHP and that have with a reasonable possibility to be adversely affected to reassess their integrity.

A technical report presenting the results of the identification of historic properties will be prepared and submitted to you for review.

Consultation

Please let me know if your Tribe would like to participate as a Consulting Party in the Section 106 process and if there are properties of religious or cultural importance to your Tribe within the Project Area. Early identification of Tribal concerns will allow NASA and FAA to consider ways to avoid and minimize potential impacts to Tribal resources and practices. Your timely response will greatly assist us in incorporating your comments into project planning.

If you have any questions or need further information on the project, please contact me at 321-867-8454 or via email at katherine.s.zeringue@nasa.gov.

Sincerely,
Katherine Zeringue
Cultural Resources Manager
John F. Kennedy Space Center
Spaceport Integration & Services
Environmental Management Branch, SI-E3
Kennedy Space Center, FL 32899
321-867-8454



^[1] Historic property means any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places maintained by the Secretary of the Interior. This term includes artifacts, records, and remains that are related to and located within such properties. The term includes properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization and that meet the National Register criteria. 36 CFR 800.16(l)(1)

From: [Zeringue, Katherine S. \(KSC-SIE30\)](#)
To: [Jason Daniel](#)
Subject: RE: [EXTERNAL] Telephone follow-up
Date: Monday, January 27, 2025 2:57:00 PM
Attachments: [Applied EarthWorks" Blue Origin Noise Report .pdf](#);
[Launch Trajectories Atlantic Ocean \(002\).pdf](#);
[Landing Trajectories Atlantic Ocean and GOM \(002\).pdf](#)

Good Afternoon Jason,

In answer to your questions, I'm forwarding you additional information regarding a study looking at the effects of rocket noise/vibration on archaeological sites in California. This report was referenced in the Section 106 materials that we sent out, but not provided in full. The conclusions of that report is that the soil matrix is protective and no concerns related to the stability of archaeological sites was noted.

I have also attached both the launch and landing trajectories. All launches will head out over water. Landings are expected to traverse across the state of Florida back to Launch Complex 39A.

If there is anything else you need, please let me know.

Sincerely,
Katherine Zeringue
Cultural Resources Manager
John F. Kennedy Space Center
Spaceport Integration & Services
Environmental Management Branch, SI-E3
Kennedy Space Center, FL 32899
321-867-8454



From: Jason Daniel <JasonD@miccosukeetribe.com>
Sent: Friday, January 24, 2025 7:51 AM
To: Zeringue, Katherine S. (KSC-SIE30) <katherine.s.zeringue@nasa.gov>
Subject: Re: [EXTERNAL] Telephone follow-up

CAUTION: This email originated from outside of NASA. Please take care when clicking links or opening attachments. Use the "Report Message" button to report suspicious messages to the NASA SOC.

Good morning, Katherine,

I apologize for the delayed response this week following our phone conversation. Thanks again for

reaching out.

Regarding the SpaceX material, we do have a few questions. For the mention of vibrations, I read what is contained in the report, and we were wondering, is there any way of quantifying what level of vibrations reaches possible resources underground, or is that level more or less negligible because of the soil matrix? Related to this first question, and continuing what we discussed on the phone re: buried resources versus buildings, are there any particular reasons your agency thinks we should be concerned about the sound and vibration in relation to cultural resources?

Finally, do you also have information about the direction of these launches? For example, do they fly inland, or do they all launch over the sea, or is there variation? This could be a potential cultural concern, depending on the answer.

Thank you for your time,

Jason

Jason M. Daniel, Ph.D.

Tribal Historic Preservation Officer (THPO)
Miccosukee Tribe of Indians of Florida
P.O. Box 440021 | Miami FL 33144
Office: 305.223.8380, ext. 6061 | Mobile: 786.810.7981

Sent from my iPhone

On Jan 16, 2025, at 16:11, Zeringue, Katherine S. (KSC-SIE30)
<katherine.s.zeringue@nasa.gov> wrote:

No worries. Thanks for letting me know.

Katherine Zeringue
Cultural Resources Manager
John F. Kennedy Space Center
Spaceport Integration & Services
Environmental Management Branch, SI-E3
Kennedy Space Center, FL 32899
321-867-8454

<image001.jpg>

From: Jason Daniel <jasonD@miccosukeetribe.com>

Sent: Thursday, January 16, 2025 3:58 PM
To: Zeringue, Katherine S. (KSC-SIE30) <katherine.s.zeringue@nasa.gov>
Subject: [EXTERNAL] Telephone follow-up

CAUTION: This email originated from outside of NASA. Please take care when clicking links or opening attachments. Use the "Report Message" button to report suspicious messages to the NASA SOC.

Good afternoon, Katherine,

Thanks again for reaching out yesterday to inquire whether the Miccosukee Tribe has any questions about recent communications. I'm not going to be able to gather today the information we discussed on the phone. I will have to be in touch again the beginning of next week, so I will email or call you on Tuesday (since Monday is a holiday).

Thanks,

Jason

Jason M. Daniel, Ph.D.

Tribal Historic Preservation Officer (THPO)
Miccosukee Tribe of Indians of Florida
P.O. Box 440021 | Miami FL 33144
Office: 305.223.8380, ext. 6061 | Mobile: 786.810.7981

Sent from my iPhone

From: [Rebecca Zingarelli](#)
To: [Zeringue, Katherine S. \(KSC-SIE30\)](#)
Cc: [Lighthouse Foundation President](#)
Subject: [EXTERNAL] Re: Response Requested by 1/24/25 -Section 106 Consulting Party Invitation: SpaceX Starship Super Heavy Launch and Reentry Vehicles at Launch Complex-39A, Kennedy Space Center
Date: Saturday, December 28, 2024 2:09:32 PM

CAUTION: This email originated from outside of NASA. Please take care when clicking links or opening attachments. Use the "Report Message" button to report suspicious messages to the NASA SOC.

Thank you for this opportunity. The Cape Canaveral Lighthouse Foundation would like to participate as a Consulting Party.

Our historic properties include the lighthouse, constructed in 1868 on the tip of Cape Canaveral, and moved to its current location in 1894. Adjacent to the lighthouse is an oil house constructed circa 1900. Original brick work and foundations are also located underground at the same location.

We appear to be just outside the area of most danger, but would like to follow the discussion going forward, in case additional information relative to impacts on the lighthouse arise.

Please let me know if you need anything else from us.

Very Respectfully,

Becky Zingarelli, Museum Director
Cape Canaveral Lighthouse
321-704-9194

From: Zeringue, Katherine S. (KSC-SIE30) <katherine.s.zeringue@nasa.gov>
Sent: Friday, December 20, 2024 5:12 PM
To: info@americanspacemuseum.org <info@americanspacemuseum.org>; mdukes677@gmail.com <mdukes677@gmail.com>; cjsnotebook@yahoo.com <cjsnotebook@yahoo.com>; mboonstra@brev.org <mboonstra@brev.org>; Nancyrader1@aol.com <Nancyrader1@aol.com>; kristen_kneifl@nps.gov <kristen_kneifl@nps.gov>; info@canaverallight.org <info@canaverallight.org>; James.draper.2@spaceforce.mil <James.draper.2@spaceforce.mil>; thomas.penders@spaceforce.mil <thomas.penders@spaceforce.mil>; Bradley.parrish@titusville.com <Bradley.parrish@titusville.com>; ty.matejowsky@usf.edu <ty.matejowsky@usf.edu>; president@fasweb.org <president@fasweb.org>; Ben.brotemarkle@myfloridahistory.org <Ben.brotemarkle@myfloridahistory.org>; semiller@flagler.edu <semiller@flagler.edu>; titusvillehistory@gmail.com

<titusvillehistory@gmail.com>; irasarchaeology@yahoo.com <irasarchaeology@yahoo.com>;

Tiercel@earthlink.net <Tiercel@earthlink.net>; richard_kanaski@fws.gov

<richard_kanaski@fws.gov>; info@nalfl.com <info@nalfl.com>; info@spaceclub.org

<info@spaceclub.org>; roz@callhenry.com <roz@callhenry.com>; titusvillehistory@gmail.com

<titusvillehistory@gmail.com>; Annita.sbhs@gmail.com <Annita.sbhs@gmail.com>

Cc: Long, Eva (FAA) <Eva.Long@faa.gov>; Zee, Stacey (FAA) <Stacey.Zee@faa.gov>; Hanson, Amy

(FAA) <Amy.Hanson@faa.gov>; Dankert, Donald J. (KSC-SIE30) <donald.j.dankert@nasa.gov>

Subject: Response Requested by 1/24/25 -Section 106 Consulting Party Invitation: SpaceX Starship Super Heavy Launch and Reentry Vehicles at Launch Complex-39A, Kennedy Space Center

The National Aeronautics and Space Administration's Kennedy Space Center (NASA KSC) is inviting your organization to participate as a Consulting Party, pursuant to Section 106 of the National Historic Preservation Act of 1966, for the Federal Aviation Administration's (FAA) environmental review for the proposed action for the SpaceX Starship and Super Heavy launch and reentry vehicles at Launch Complex-39A (LC-39A). Under the supervision of the FAA's Office of Commercial Space Transportation, SpaceX is preparing an Environmental Impact Statement (EIS) to evaluate the potential impacts of proposed infrastructure construction, and ground, launch, and reentry operations associated with the Starship Super Heavy launch and reentry vehicles at LC-39A. Because SpaceX plans to apply to the FAA's Office of Commercial Space Transportation for a vehicle operator license for Starship Super Heavy, the EIS will conform to the FAA's National Environmental Policy Act (NEPA) implementing policy, FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*, regarding the potential infrastructure construction, ground operations, launch, and reentry-related impacts. NASA KSC is acting as the lead federal agency for compliance with Section 106 of the NHPA. As such, Section 106 will be conducted pursuant to the 2009 *Programmatic Agreement Among the National Aeronautics and Space Administration, John F. Kennedy Space Center, Advisory Council on Historic Preservation, and the Florida State Historic Preservation Officer: Regarding Management of Historic Properties at the Kennedy Space Center*, or any subsequent version thereof.

If you are unfamiliar with the Section 106 consultation process or the role of a Consulting Party, please review the Advisory Council on Historic Preservation's *Protecting Historic Properties: A Citizen's Guide to Section 106 Review* which can be found at: <https://www.achp.gov/protecting-historic-properties>.

Description of the Undertaking

The undertaking involves issuance of a vehicle operator license by the FAA's Office of Commercial Space Transportation that will facilitate ground, launch, and reentry operations associated with the SpaceX Starship Super Heavy at LC-39A. Specifically, this would include up to 44 launches of Starship Super Heavy per year; return of the first stage booster to LC-39A; return of Starship to LC-39A; and construction of an air separation unit for liquid oxygen and liquid nitrogen, onsite natural gas liquefaction production and cryogenic liquid storage capability, roadway improvements, other associated infrastructure, and a catch tower (see **Enclosure 1**).

Area of Potential Effects

The area of potential effects (APE) considers any physical, visual, or auditory effects that the project may have on historic properties ^[1]. As such, the APE has been developed to consider both a

construction APE and an operational APE. The construction APE is limited within the existing boundaries of LC-39A. Additionally, it is anticipated that proposed new construction associated with the operation of the Starship Super Heavy will be compatible with the characteristic of other launch complex infrastructure and will not pose viewshed effects to historic properties. The operational APE considers the auditory effects of the Starship Super Heavy launch activity as well as the overpressure effects of the sonic boom generated during atmospheric reentry. FAA guidance stipulates consideration of a 130 decibel (dB) threshold for launch effects and a 2.0 pounds per square foot (psf) threshold for effects from the sonic boom. Based on this information, and previous research regarding rocket engine noise and vibration effects to structures, the APE was established as any area subjected to greater than or equal to 2.0 psf sonic booms (see **Enclosure 2, Figure 2**). This area also encompasses the 130 dB threshold for launch effects, as well as the construction APE.

Initial Identification of Historic Properties and Proposed Identification Efforts

The proposed identification approach is designed to make a reasonable and good faith effort to identify historic properties within the APE that may be affected by the undertaking. Effects related to construction will be limited within the footprint of LC-39A. This area has already been subject to survey and evaluation and will not require additional studies. The fieldwork and analysis will therefore focus on historic properties subject to the potential effects of elevated noise and vibrations associated with the undertaking.

The undertaking has the potential to affect historic properties from increased vibratory impacts. According to data provided by SpaceX, launch and reentry events are estimated to result in Lmax levels of 130 dB and/or sonic boom impacts of 2 psf or higher within the APE. Archaeological resources consisting solely of either surface scatters or subsurface deposits are not likely to be affected by the vibratory effects of increased sonic boom exposure due to the protective qualities of the surrounding soil matrix. Similarly, underwater archaeological sites are unlikely to be affected. However, vibratory effects may be greater on historic age resources within the built environment. Architectural elements most susceptible to damage from launch and reentry vehicle noise include windows and, infrequently, plastered walls and ceilings. Vibration effects may be greatest to non-structural elements such as fragile glass and loose plaster/stone ornamentation. The enclosed memorandum provides additional information on this summation of the potential for vibratory effects on cultural resources (see **Enclosure 2**).

Previously Recorded Resources Within the APE

Historic properties within the construction APE include the Launch Complex 39 Pad A Historic District (**8BR1686**) which is listed in the National Register of Historic Places (NRHP). The historic district is the first of two launch pads constructed by NASA in the 1960s to accommodate the Saturn V launch vehicle for Apollo missions and modified in the 1970s to accommodate the Space Shuttle Program. The historic district contains 23 extant contributing resources all used to support launch operations. One contributing resource, Launch Complex 39 Pad A (**8BR1995**), is also individually listed in the NRHP. No archaeological sites have been recorded or documented within LC-39A.

A preliminary assessment of the operational APE, using data contained in the Florida Master Site File (FMSF), identified 2,964 previously recorded resources, including 2,315 structures, 31 bridges, 465 archaeological sites, 31 cemeteries, and 122 resource groups. Of these, 35 properties are listed in

the NRHP and 353 have been evaluated as eligible (see **Enclosure 2**).

Approach for the Identification of Historic Properties

In 2010, NASA KSC completed HAER documentation of the LC-39A historic district and its associated contributing resources. As such, LC-39A is well documented and no further identification or evaluation of LC-39A is proposed.

Identification efforts will focus on historic properties that may be subject to physical damage from elevated noise and vibrations as well as cultural resources whose setting and feeling may be affected by audible and acoustic effects during launch and reentry activities. This will include buildings and structures within the APE that were not specifically designed to withstand the concussive forces of launching and landing spacecraft. Additionally, there are specific types of cultural resources for which aspects of setting and feeling are more likely to represent important components of historic integrity. These types of cultural resources potentially include:

- Designed historic landscapes such as parks and gardens
- Rural historic landscapes with continuity in their traditional use (farming, hunting/fishing, sports/recreation)
- Historic districts
- Historic sites that feature outdoor spaces such as yards and plazas
- Cemeteries

Since the universe of properties in the APE will include many thousands of buildings and structures, identification efforts will focus on properties greater than 45 years of age, in areas that have not been surveyed within the last 10 years, and limited to historic properties and potential historic properties that may reasonably be affected by the undertaking. Previously recorded resources that were determined ineligible for listing in the NRHP will be excluded from further identification and evaluation efforts.

Historic properties will be identified in two ways. First, NASA KSC, supported by SEARCH, will compile an inventory of previously recorded cultural resources within the APE that are listed, eligible for listing, potentially eligible for listing, and unevaluated for listing in the NRHP. NASA KSC will use the FMSF database as well as the Integrated Cultural Resource Management Plans from both KSC and the Cape Canaveral Space Force Station. Additionally, county property appraiser databases will be queried to identify unrecorded historic aboveground resources within the APE. Parcel data contains built year information, which can be cross-referenced with recorded resources to identify parcels that contain structures 45 years old or older without recorded resources. Historic maps and aerial photographs will be used to examine land use and development changes over time, and a historic context will be developed for the APE. Data will be further supplemented with information on unrecorded cultural resources provided by consulting parties and the public. The cumulative data will be used to develop a Geographic Information System heat map within the APE to identify areas with high concentrations of unrecorded structures that are 45 years old or older. These data sets will be

used to identify and create a list of properties that will be subject to survey fieldwork. The preliminary inventory data are provided in **Enclosure 2**.

Second, fieldwork will be conducted with three primary objectives:

1. Conduct a windshield survey guided by the heat map discussed above, in order to identify potential historic properties.
2. Complete FMSF documentation for potential historic properties identified during the windshield survey that have a reasonable possibility to be adversely affected by the undertaking. The architectural historians will identify and photograph potential historic properties that appear to embody historic significance established in the historic context. They will also identify and document the character-defining features that are indicative of NRHP eligibility and that may be susceptible to adverse effects, as discussed in Section 1.2. All newly recorded resources will be assumed NRHP-eligible, for the purposes of Section 106 consultation.
3. Revisit NRHP-listed or eligible historic properties that are individually eligible for the NRHP and that have with a reasonable possibility to be adversely affected to reassess their integrity.

NASA KSC has two requests. First, please provide NASA KSC with any information your organization has about cultural resources within the APE that may need to be a part of the identification effort and/or for which you have concerns regarding project effects. Second, **please respond in writing to confirm your participation as a Consulting Party for this project by January 24, 2025**. If you decline to be a Consulting Party or do not respond by the deadline, no further Section 106 consultation materials will be forwarded to your organization. However, your organization will still have the opportunity to review and comment on materials available to the public on FAA's project website at: https://www.faa.gov/space/stakeholder_engagement/spacex_starship_ksc/.

Cultural resource information and/or Consulting Party participation responses should be emailed to me. If you have any questions or require further assistance, please contact me.

Sincerely,
Katherine Zeringue
Cultural Resources Manager
John F. Kennedy Space Center
Spaceport Integration & Services
Environmental Management Branch, SI-E3
Kennedy Space Center, FL 32899
321-867-8454



^[1] Historic property means any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places maintained by the Secretary of the Interior. This term includes artifacts, records, and remains that are related to and located within such properties. The term includes properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization and that meet the National Register criteria. 36 CFR 800.16(l)(1)

From: [Kneifl, Kristen R](#)
To: [Zeringue, Katherine S. \(KSC-SIE30\)](#)
Cc: [Long, Eva \(FAA\)](#); [Zee, Stacey \(FAA\)](#); [Hanson, Amy \(FAA\)](#); [Dankert, Donald J. \(KSC-SIE30\)](#); [Thomson, Carmen M.](#); [Dennis, Meredith E.](#); [Rogers, Stephen C](#)
Subject: [EXTERNAL] Response Requested by 1/24/25 -Section 106 Consulting Party Invitation: SpaceX Starship Super Heavy Launch and Reentry Vehicles at Launch Complex-39A, Kennedy Space Center
Date: Tuesday, January 14, 2025 12:25:32 PM

Hello Katherine,

Canaveral National Seashore/National Park Service would like to be a 106-consulting party on the NASA/FAA SpaceX Starship EIS. Our agency has shared cultural resource information with KSC NASA previously via the NPS database, the Historic Resource Study, the Archeological Overview and Assessment, and reports on individual sites and projects that are north of the secure area.

Canaveral National Seashore also has a museum building located at the southern boundary adjacent to the launch pads. The museum building houses important archeological, biological, paleontological, historical, and archival objects from the Seashore and KSC. Some of these objects are breakable and/or stored in flammable liquids (in a flammable cabinet) which could be susceptible to damage from strong vibrations which is a concern.

Please let us know if there is any other information we can provide.

Thank you,
 Kristen

Kristen Kneifl
 Canaveral National Seashore
 Resource Management Specialist
 212 S. Washington Avenue
 Titusville, FL 32796
 321-403-5680 (cell)

From: Zeringue, Katherine S. (KSC-SIE30) <katherine.s.zeringue@nasa.gov>
Sent: Friday, December 20, 2024 5:12 PM
To: info@americanspacemuseum.org <info@americanspacemuseum.org>; mdukes677@gmail.com <mdukes677@gmail.com>; cjsnotebook@yahoo.com <cjsnotebook@yahoo.com>; mboonstra@brev.org <mboonstra@brev.org>; Nancyrader1@aol.com <Nancyrader1@aol.com>; Kneifl, Kristen R <Kristen_Kneifl@nps.gov>; info@canaverallight.org <info@canaverallight.org>; James.draper.2@spaceforce.mil <James.draper.2@spaceforce.mil>; thomas.penders@spaceforce.mil <thomas.penders@spaceforce.mil>; Bradley.parrish@titusville.com <Bradley.parrish@titusville.com>; ty.matejowsky@usf.edu <ty.matejowsky@usf.edu>; president@fasweb.org <president@fasweb.org>; Ben.brotemarkle@myfloridahistory.org <Ben.brotemarkle@myfloridahistory.org>;

semiller@flagler.edu <semiller@flagler.edu>; titusvillehistory@gmail.com
 <titusvillehistory@gmail.com>; irasarchaeology@yahoo.com <irasarchaeology@yahoo.com>;
 Tiercel@earthlink.net <Tiercel@earthlink.net>; Kanaski, Richard <richard_kanaski@fws.gov>;
 info@nalfl.com <info@nalfl.com>; info@spaceclub.org <info@spaceclub.org>; roz@callhenry.com
 <roz@callhenry.com>; titusvillehistory@gmail.com <titusvillehistory@gmail.com>;
 Annita.sbhs@gmail.com <Annita.sbhs@gmail.com>
Cc: Long, Eva (FAA) <Eva.Long@faa.gov>; Zee, Stacey (FAA) <Stacey.Zee@faa.gov>; Hanson, Amy
 (FAA) <Amy.Hanson@faa.gov>; Dankert, Donald J. (KSC-SIE30) <donald.j.dankert@nasa.gov>
Subject: [EXTERNAL] Response Requested by 1/24/25 -Section 106 Consulting Party Invitation:
 SpaceX Starship Super Heavy Launch and Reentry Vehicles at Launch Complex-39A, Kennedy Space
 Center

This email has been received from outside of DOI - Use caution before clicking on links, opening attachments, or responding.

The National Aeronautics and Space Administration's Kennedy Space Center (NASA KSC) is inviting your organization to participate as a Consulting Party, pursuant to Section 106 of the National Historic Preservation Act of 1966, for the Federal Aviation Administration's (FAA) environmental review for the proposed action for the SpaceX Starship and Super Heavy launch and reentry vehicles at Launch Complex-39A (LC-39A). Under the supervision of the FAA's Office of Commercial Space Transportation, SpaceX is preparing an Environmental Impact Statement (EIS) to evaluate the potential impacts of proposed infrastructure construction, and ground, launch, and reentry operations associated with the Starship Super Heavy launch and reentry vehicles at LC-39A. Because SpaceX plans to apply to the FAA's Office of Commercial Space Transportation for a vehicle operator license for Starship Super Heavy, the EIS will conform to the FAA's National Environmental Policy Act (NEPA) implementing policy, FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*, regarding the potential infrastructure construction, ground operations, launch, and reentry-related impacts. NASA KSC is acting as the lead federal agency for compliance with Section 106 of the NHPA. As such, Section 106 will be conducted pursuant to the 2009 *Programmatic Agreement Among the National Aeronautics and Space Administration, John F. Kennedy Space Center, Advisory Council on Historic Preservation, and the Florida State Historic Preservation Officer: Regarding Management of Historic Properties at the Kennedy Space Center*, or any subsequent version thereof.

If you are unfamiliar with the Section 106 consultation process or the role of a Consulting Party, please review the Advisory Council on Historic Preservation's *Protecting Historic Properties: A Citizen's Guide to Section 106 Review* which can be found at: <https://www.achp.gov/protecting-historic-properties>.

Description of the Undertaking

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liquefaction production and cryogenic liquid storage capability, roadway improvements, other associated infrastructure, and a catch tower (see **Enclosure 1**).

Area of Potential Effects

The area of potential effects (APE) considers any physical, visual, or auditory effects that the project may have on historic properties^[1]. As such, the APE has been developed to consider both a construction APE and an operational APE. The construction APE is limited within the existing boundaries of LC-39A. Additionally, it is anticipated that proposed new construction associated with the operation of the Starship Super Heavy will be compatible with the characteristic of other launch complex infrastructure and will not pose viewshed effects to historic properties. The operational APE considers the auditory effects of the Starship Super Heavy launch activity as well as the overpressure effects of the sonic boom generated during atmospheric reentry. FAA guidance stipulates consideration of a 130 decibel (dB) threshold for launch effects and a 2.0 pounds per square foot (psf) threshold for effects from the sonic boom. Based on this information, and previous research regarding rocket engine noise and vibration effects to structures, the APE was established as any area subjected to greater than or equal to 2.0 psf sonic booms (see **Enclosure 2, Figure 2**). This area also encompasses the 130 dB threshold for launch effects, as well as the construction APE.

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Previously Recorded Resources Within the APE

Historic properties within the construction APE include the Launch Complex 39 Pad A Historic District (8BR1686) which is listed in the National Register of Historic Places (NRHP). The historic district is the first of two launch pads constructed by NASA in the 1960s to accommodate the Saturn V launch vehicle for Apollo missions and modified in the 1970s to accommodate the Space Shuttle Program. The historic district contains 23 extant contributing resources all used to support launch operations.

One contributing resource, Launch Complex 39 Pad A (**88R1995**), is also individually listed in the NRHP. No archaeological sites have been recorded or documented within LC-39A.

A preliminary assessment of the operational APE, using data contained in the Florida Master Site File (FMSF), identified 2,964 previously recorded resources, including 2,315 structures, 31 bridges, 465 archaeological sites, 31 cemeteries, and 122 resource groups. Of these, 35 properties are listed in the NRHP and 353 have been evaluated as eligible (see **Enclosure 2**).

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- Cemeteries

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2. Complete FMSF documentation for potential historic properties identified during the windshield survey that have a reasonable possibility to be adversely affected by the undertaking. The architectural historians will identify and photograph potential historic properties that appear to embody historic significance established in the historic context. They will also identify and document the character-defining features that are indicative of NRHP eligibility and that may be susceptible to adverse effects, as discussed in Section 1.2. All newly recorded resources will be assumed NRHP-eligible, for the purposes of Section 106 consultation.
3. Revisit NRHP-listed or eligible historic properties that are individually eligible for the NRHP and that have with a reasonable possibility to be adversely affected to reassess their integrity.

NASA KSC has two requests. First, please provide NASA KSC with any information your organization has about cultural resources within the APE that may need to be a part of the identification effort and/or for which you have concerns regarding project effects. Second, **please respond in writing to confirm your participation as a Consulting Party for this project by January 24, 2025**. If you decline to be a Consulting Party or do not respond by the deadline, no further Section 106 consultation materials will be forwarded to your organization. However, your organization will still have the opportunity to review and comment on materials available to the public on FAA's project website at: https://www.faa.gov/space/stakeholder_engagement/spacex_starship_ksc/.

Cultural resource information and/or Consulting Party participation responses should be emailed to me. If you have any questions or require further assistance, please contact me.

Sincerely,
Katherine Zeringue
Cultural Resources Manager
John F. Kennedy Space Center
Spaceport Integration & Services
Environmental Management Branch, SI-E3

Kennedy Space Center, FL 32899
321-867-8454



[1] Historic property means any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places maintained by the Secretary of the Interior. This term includes artifacts, records, and remains that are related to and located within such properties. The term includes properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization and that meet the National Register criteria. 36 CFR 800.16(l)(1)

From: Roz Foster
To: Zeringue, Katherine S. (KSC-SIE30)
Subject: [EXTERNAL] RE: Response Required by 1/24/25 -Section 106 Consulting Party Invitation: SpaceX Starship Super Heavy Launch and Reentry Vehicles at Launch Complex-39A, Kennedy Space Center
Date: Monday, January 20, 2025 11:32:47 AM

CAUTION: This email originated from outside of NASA. Please take care when clicking links or opening attachments. Use the "Report Message" button to report suspicious messages to the NASA SOC.

I have reviewed the attached reports and find that you have identified the historic structures and archaeological sites that are located within the identified APE area. Our concerns are the noise and vibration impacts of both launches and landings to the respective identified resources and how they would also impact the general public. I would like to see results of a recent impact study at Boco Chico site in regard to noise and vibration of both launches and landings to the surrounding area. I think that the SpaceX Starship Project and Super Heavy Launch and Reentry Vehicles are extremely important to the future of space exploration and development of KSC for future generations. Roz Foster, President North Brevard Heritage Foundation, Inc.

From: Zeringue, Katherine S. (KSC-SIE30) <katherine.s.zeringue@nasa.gov>
Sent: Wednesday, January 15, 2025 3:06 PM
To: info@americanspacemuseum.org; mdukes677@gmail.com; cjsnotebook@yahoo.com; mboonstra@brev.org; Nancyrader1@aol.com; James.draper.2@spaceforce.mil; thomas.penders@spaceforce.mil; ty.matejowsky@usf.edu; president@fasweb.org; Ben.brotemarkle@myfloridahistory.org; semiller@flagler.edu; titusvillehistory@gmail.com; irasarchaeology@yahoo.com; Tiercel@earthlink.net; richard_kanaski@fws.gov; info@nalfi.com; info@spaceclub.org; Roz Foster <Roz@callhenry.com>; titusvillehistory@gmail.com; Annita.sbh@s@gmail.com
Cc: Long, Eva (FAA) <Eva.Long@faa.gov>; Zee, Stacey (FAA) <Stacey.Zee@faa.gov>; Hanson, Amy (FAA) <Amy.Hanson@faa.gov>
Subject: Response Required by 1/24/25 -Section 106 Consulting Party Invitation: SpaceX Starship Super Heavy Launch and Reentry Vehicles at Launch Complex-39A, Kennedy Space Center

Hello Again,

The message below, regarding SpaceX's launch and landing activities at the Kennedy Space Center, was emailed to your organization on December 20, 2024. You should have also received a letter in the mail at the beginning of January 2025. This is a reminder that NASA KSC is requesting any information your organization has about historic properties within the Area of Potential Effects (see Enclosure 2/Figure 1) and/or for which you have concerns regarding project effects. Second, **please respond to me via email to confirm your participation as a Consulting Party for this project by January 24, 2025.** If you decline to be a Consulting Party or do not respond by the deadline, no further Section 106 consultation materials will be forwarded to your organization. However, your organization will still have the opportunity to review and comment on materials available to the public on FAA's project website at:
https://www.faa.gov/space/stakeholder_engagement/spacex_starship_ksc/.

Sincerely,
 Katherine Zeringue
 Cultural Resources Manager
 John F. Kennedy Space Center
 Spaceport Integration & Services
 Environmental Management Branch, SI-E3
 Kennedy Space Center, FL 32899
 321-867-8454



From: Zeringue, Katherine S. (KSC-SIE30)
Sent: Friday, December 20, 2024 5:13 PM
To: info@americanspacemuseum.org; mdukes677@gmail.com; cjsnotebook@yahoo.com; mboonstra@brev.org; Nancyrader1@aol.com; kristen_kneifi@nps.gov; info@canaverallight.org; James.draper.2@spaceforce.mil; thomas.penders@spaceforce.mil; Bradley.parrish@titusville.com; ty.matejowsky@usf.edu; president@fasweb.org; Ben.brotemarkle@myfloridahistory.org; semiller@flagler.edu; titusvillehistory@gmail.com; irasarchaeology@yahoo.com; Tiercel@earthlink.net; richard_kanaski@fws.gov; info@nalfi.com; info@spaceclub.org; roz@callhenry.com; titusvillehistory@gmail.com; Annita.sbhs@gmail.com
Cc: Long, Eva (FAA) <Eva.Long@faa.gov>; Zee, Stacey (FAA) <Stacey.Zee@faa.gov>; Hanson, Amy (FAA) <Amy.Hanson@faa.gov>; Dankert, Donald J. (KSC-SIE30) <donald.j.dankert@nasa.gov>
Subject: Response Requested by 1/24/25 -Section 106 Consulting Party Invitation: SpaceX Starship Super Heavy Launch and Reentry Vehicles at Launch Complex-39A, Kennedy Space Center

The National Aeronautics and Space Administration's Kennedy Space Center (NASA KSC) is inviting your organization to participate as a Consulting Party, pursuant to Section 106 of the National Historic Preservation Act of 1966, for the Federal Aviation Administration's (FAA) environmental review for the proposed action for the SpaceX Starship and Super Heavy launch and reentry vehicles at Launch Complex-39A (LC-39A). Under the supervision of the FAA's Office of Commercial Space Transportation, SpaceX is preparing an Environmental Impact Statement (EIS) to evaluate the potential impacts of proposed infrastructure construction, and ground, launch, and reentry operations associated with the Starship Super Heavy launch and reentry vehicles at LC-39A. Because SpaceX plans to apply to the FAA's Office of Commercial Space Transportation for a vehicle operator license for Starship Super Heavy, the EIS will conform to the FAA's National Environmental Policy Act (NEPA) implementing policy, FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*, regarding the potential infrastructure construction, ground operations, launch, and reentry-related impacts. NASA KSC is acting as the lead federal agency for compliance with Section 106 of the NHPA. As such, Section 106 will be conducted pursuant to the 2009 *Programmatic Agreement Among the National Aeronautics and Space Administration, John F. Kennedy Space Center, Advisory Council on Historic Preservation, and the Florida State Historic Preservation Officer: Regarding Management of*

Historic Properties at the Kennedy Space Center, or any subsequent version thereof.

If you are unfamiliar with the Section 106 consultation process or the role of a Consulting Party, please review the Advisory Council on Historic Preservation's *Protecting Historic Properties: A Citizen's Guide to Section 106 Review* which can be found at: <https://www.achp.gov/protecting-historic-properties>.

Description of the Undertaking

The undertaking involves issuance of a vehicle operator license by the FAA's Office of Commercial Space Transportation that will facilitate ground, launch, and reentry operations associated with the SpaceX Starship Super Heavy at LC-39A. Specifically, this would include up to 44 launches of Starship Super Heavy per year; return of the first stage booster to LC-39A; return of Starship to LC-39A; and construction of an air separation unit for liquid oxygen and liquid nitrogen, onsite natural gas liquefaction production and cryogenic liquid storage capability, roadway improvements, other associated infrastructure, and a catch tower (see **Enclosure 1**).

Area of Potential Effects

The area of potential effects (APE) considers any physical, visual, or auditory effects that the project may have on historic properties^[1]. As such, the APE has been developed to consider both a construction APE and an operational APE. The construction APE is limited within the existing boundaries of LC-39A. Additionally, it is anticipated that proposed new construction associated with the operation of the Starship Super Heavy will be compatible with the characteristic of other launch complex infrastructure and will not pose viewshed effects to historic properties. The operational APE considers the auditory effects of the Starship Super Heavy launch activity as well as the overpressure effects of the sonic boom generated during atmospheric reentry. FAA guidance stipulates consideration of a 130 decibel (dB) threshold for launch effects and a 2.0 pounds per square foot (psf) threshold for effects from the sonic boom. Based on this information, and previous research regarding rocket engine noise and vibration effects to structures, the APE was established as any area subjected to greater than or equal to 2.0 psf sonic booms (see **Enclosure 2, Figure 2**). This area also encompasses the 130 dB threshold for launch effects, as well as the construction APE.

Initial Identification of Historic Properties and Proposed Identification Efforts

The proposed identification approach is designed to make a reasonable and good faith effort to identify historic properties within the APE that may be affected by the undertaking. Effects related to construction will be limited within the footprint of LC-39A. This area has already been subject to survey and evaluation and will not require additional studies. The fieldwork and analysis will therefore focus on historic properties subject to the potential effects of elevated noise and vibrations associated with the undertaking.

The undertaking has the potential to affect historic properties from increased vibratory impacts. According to data provided by SpaceX, launch and reentry events are estimated to result in L_{max} levels of 130 dB and/or sonic boom impacts of 2 psf or higher within the APE. Archaeological resources consisting solely of either surface scatters or subsurface deposits are not likely to be affected by the vibratory effects of increased sonic boom exposure due to the protective qualities of the surrounding soil matrix. Similarly, underwater archaeological sites are unlikely to be affected.

However, vibratory effects may be greater on historic age resources within the built environment. Architectural elements most susceptible to damage from launch and reentry vehicle noise include windows and, infrequently, plastered walls and ceilings. Vibration effects may be greatest to non-structural elements such as fragile glass and loose plaster/stone ornamentation. The enclosed memorandum provides additional information on this summation of the potential for vibratory effects on cultural resources (see **Enclosure 2**).

Previously Recorded Resources Within the APE

Historic properties within the construction APE include the Launch Complex 39 Pad A Historic District (**8BR1686**) which is listed in the National Register of Historic Places (NRHP). The historic district is the first of two launch pads constructed by NASA in the 1960s to accommodate the Saturn V launch vehicle for Apollo missions and modified in the 1970s to accommodate the Space Shuttle Program. The historic district contains 23 extant contributing resources all used to support launch operations. One contributing resource, Launch Complex 39 Pad A (**8BR1995**), is also individually listed in the NRHP. No archaeological sites have been recorded or documented within LC-39A.

A preliminary assessment of the operational APE, using data contained in the Florida Master Site File (FMSF), identified 2,964 previously recorded resources, including 2,315 structures, 31 bridges, 465 archaeological sites, 31 cemeteries, and 122 resource groups. Of these, 35 properties are listed in the NRHP and 353 have been evaluated as eligible (see **Enclosure 2**).

Approach for the Identification of Historic Properties

In 2010, NASA KSC completed HAER documentation of the LC-39A historic district and its associated contributing resources. As such, LC-39A is well documented and no further identification or evaluation of LC-39A is proposed.

Identification efforts will focus on historic properties that may be subject to physical damage from elevated noise and vibrations as well as cultural resources whose setting and feeling may be affected by audible and acoustic effects during launch and reentry activities. This will include buildings and structures within the APE that were not specifically designed to withstand the concussive forces of launching and landing spacecraft. Additionally, there are specific types of cultural resources for which aspects of setting and feeling are more likely to represent important components of historic integrity. These types of cultural resources potentially include:

- Designed historic landscapes such as parks and gardens
- Rural historic landscapes with continuity in their traditional use (farming, hunting/fishing, sports/recreation)
- Historic districts
- Historic sites that feature outdoor spaces such as yards and plazas
- Cemeteries

Since the universe of properties in the APE will include many thousands of buildings and structures, identification efforts will focus on properties greater than 45 years of age, in areas that have not been surveyed within the last 10 years, and limited to historic properties and potential historic properties that may reasonably be affected by the undertaking. Previously recorded resources that

were determined ineligible for listing in the NRHP will be excluded from further identification and evaluation efforts.

Historic properties will be identified in two ways. First, NASA KSC, supported by SEARCH, will compile an inventory of previously recorded cultural resources within the APE that are listed, eligible for listing, potentially eligible for listing, and unevaluated for listing in the NRHP. NASA KSC will use the FMSF database as well as the Integrated Cultural Resource Management Plans from both KSC and the Cape Canaveral Space Force Station. Additionally, county property appraiser databases will be queried to identify unrecorded historic aboveground resources within the APE. Parcel data contains built year information, which can be cross-referenced with recorded resources to identify parcels that contain structures 45 years old or older without recorded resources. Historic maps and aerial photographs will be used to examine land use and development changes over time, and a historic context will be developed for the APE. Data will be further supplemented with information on unrecorded cultural resources provided by consulting parties and the public. The cumulative data will be used to develop a Geographic Information System heat map within the APE to identify areas with high concentrations of unrecorded structures that are 45 years old or older. These data sets will be used to identify and create a list of properties that will be subject to survey fieldwork. The preliminary inventory data are provided in **Enclosure 2**.

Second, fieldwork will be conducted with three primary objectives:

1. Conduct a windshield survey guided by the heat map discussed above, in order to identify potential historic properties.
2. Complete FMSF documentation for potential historic properties identified during the windshield survey that have a reasonable possibility to be adversely affected by the undertaking. The architectural historians will identify and photograph potential historic properties that appear to embody historic significance established in the historic context. They will also identify and document the character-defining features that are indicative of NRHP eligibility and that may be susceptible to adverse effects, as discussed in Section 1.2. All newly recorded resources will be assumed NRHP-eligible, for the purposes of Section 106 consultation.
3. Revisit NRHP-listed or eligible historic properties that are individually eligible for the NRHP and that have with a reasonable possibility to be adversely affected to reassess their integrity.

NASA KSC has two requests. First, please provide NASA KSC with any information your organization has about cultural resources within the APE that may need to be a part of the identification effort and/or for which you have concerns regarding project effects. Second, **please respond in writing to confirm your participation as a Consulting Party for this project by January 24, 2025**. If you decline to be a Consulting Party or do not respond by the deadline, no further Section 106 consultation

materials will be forwarded to your organization. However, your organization will still have the opportunity to review and comment on materials available to the public on FAA's project website at: https://www.faa.gov/space/stakeholder_engagement/spacex_starship_ksc/.

Cultural resource information and/or Consulting Party participation responses should be emailed to me. If you have any questions or require further assistance, please contact me.

Sincerely,
Katherine Zeringue
Cultural Resources Manager
John F. Kennedy Space Center
Spaceport Integration & Services
Environmental Management Branch, SI-E3
Kennedy Space Center, FL 32899
321-867-8454



^[1] Historic property means any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places maintained by the Secretary of the Interior. This term includes artifacts, records, and remains that are related to and located within such properties. The term includes properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization and that meet the National Register criteria. 36 CFR 800.16(l)(1)

From: Roz Foster
To: Zeringue, Katherine S. (KSC-SIE30)
Subject: [EXTERNAL] RE: Response Required by 1/24/25 -Section 106 Consulting Party Invitation: SpaceX Starship Super Heavy Launch and Reentry Vehicles at Launch Complex-39A, Kennedy Space Center
Date: Monday, January 20, 2025 11:32:47 AM

CAUTION: This email originated from outside of NASA. Please take care when clicking links or opening attachments. Use the "Report Message" button to report suspicious messages to the NASA SOC.

I have reviewed the attached reports and find that you have identified the historic structures and archaeological sites that are located within the identified APE area. Our concerns are the noise and vibration impacts of both launches and landings to the respective identified resources and how they would also impact the general public. I would like to see results of a recent impact study at Boco Chico site in regard to noise and vibration of both launches and landings to the surrounding area. I think that the SpaceX Starship Project and Super Heavy Launch and Reentry Vehicles are extremely important to the future of space exploration and development of KSC for future generations. Roz Foster, President North Brevard Heritage Foundation, Inc.

From: Zeringue, Katherine S. (KSC-SIE30) <katherine.s.zeringue@nasa.gov>
Sent: Wednesday, January 15, 2025 3:06 PM
To: info@americanspacemuseum.org; mdukes677@gmail.com; cjsnotebook@yahoo.com; mboonstra@brev.org; Nancyrader1@aol.com; James.draper.2@spaceforce.mil; thomas.penders@spaceforce.mil; ty.matejowsky@usf.edu; president@fasweb.org; Ben.brotemarkle@myfloridahistory.org; semiller@flagler.edu; titusvillehistory@gmail.com; irasarchaeology@yahoo.com; Tiercel@earthlink.net; richard_kanaski@fws.gov; info@nalfi.com; info@spaceclub.org; Roz Foster <Roz@callhenry.com>; titusvillehistory@gmail.com; Annita.sbh@gmail.com
Cc: Long, Eva (FAA) <Eva.Long@faa.gov>; Zee, Stacey (FAA) <Stacey.Zee@faa.gov>; Hanson, Amy (FAA) <Amy.Hanson@faa.gov>
Subject: Response Required by 1/24/25 -Section 106 Consulting Party Invitation: SpaceX Starship Super Heavy Launch and Reentry Vehicles at Launch Complex-39A, Kennedy Space Center

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https://www.faa.gov/space/stakeholder_engagement/spacex_starship_ksc/.

Sincerely,
 Katherine Zeringue
 Cultural Resources Manager
 John F. Kennedy Space Center
 Spaceport Integration & Services
 Environmental Management Branch, SI-E3
 Kennedy Space Center, FL 32899
 321-867-8454



From: Zeringue, Katherine S. (KSC-SIE30)
Sent: Friday, December 20, 2024 5:13 PM
To: info@americanspacemuseum.org; mdukes677@gmail.com; cjsnotebook@yahoo.com; mboonstra@brev.org; Nancyrader1@aol.com; kristen_kneifi@nps.gov; info@canaverallight.org; James.draper.2@spaceforce.mil; thomas.penders@spaceforce.mil; Bradley.parrish@titusville.com; ty.matejowsky@usf.edu; president@fasweb.org; Ben.brotemarkle@myfloridahistory.org; semiller@flagler.edu; titusvillehistory@gmail.com; irasarchaeology@yahoo.com; Tiercel@earthlink.net; richard_kanaski@fws.gov; info@nalfi.com; info@spaceclub.org; roz@callhenry.com; titusvillehistory@gmail.com; Annita.sbhs@gmail.com
Cc: Long, Eva (FAA) <Eva.Long@faa.gov>; Zee, Stacey (FAA) <Stacey.Zee@faa.gov>; Hanson, Amy (FAA) <Amy.Hanson@faa.gov>; Dankert, Donald J. (KSC-SIE30) <donald.j.dankert@nasa.gov>
Subject: Response Requested by 1/24/25 -Section 106 Consulting Party Invitation: SpaceX Starship Super Heavy Launch and Reentry Vehicles at Launch Complex-39A, Kennedy Space Center

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The undertaking has the potential to affect historic properties from increased vibratory impacts. According to data provided by SpaceX, launch and reentry events are estimated to result in L_{max} levels of 130 dB and/or sonic boom impacts of 2 psf or higher within the APE. Archaeological resources consisting solely of either surface scatters or subsurface deposits are not likely to be affected by the vibratory effects of increased sonic boom exposure due to the protective qualities of the surrounding soil matrix. Similarly, underwater archaeological sites are unlikely to be affected.

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Previously Recorded Resources Within the APE

Historic properties within the construction APE include the Launch Complex 39 Pad A Historic District (**8BR1686**) which is listed in the National Register of Historic Places (NRHP). The historic district is the first of two launch pads constructed by NASA in the 1960s to accommodate the Saturn V launch vehicle for Apollo missions and modified in the 1970s to accommodate the Space Shuttle Program. The historic district contains 23 extant contributing resources all used to support launch operations. One contributing resource, Launch Complex 39 Pad A (**8BR1995**), is also individually listed in the NRHP. No archaeological sites have been recorded or documented within LC-39A.

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Cultural resource information and/or Consulting Party participation responses should be emailed to me. If you have any questions or require further assistance, please contact me.

Sincerely,
Katherine Zeringue
Cultural Resources Manager
John F. Kennedy Space Center
Spaceport Integration & Services
Environmental Management Branch, SI-E3
Kennedy Space Center, FL 32899
321-867-8454



^[1] Historic property means any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places maintained by the Secretary of the Interior. This term includes artifacts, records, and remains that are related to and located within such properties. The term includes properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization and that meet the National Register criteria. 36 CFR 800.16(l)(1)

From: [North Brevard Historical Society and Museum](#)
To: [Zeringue, Katherine S. \(KSC-SIE30\)](#)
Subject: [EXTERNAL] Re: Response Requested by 1/24/25 -Section 106 Consulting Party Invitation: SpaceX Starship Super Heavy Launch and Reentry Vehicles at Launch Complex-39A, Kennedy Space Center
Date: Thursday, January 23, 2025 3:44:46 PM

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Katherine,

This is to confirm our participation as a Consulting Party for the SpaceX Starship Super Heavy Launch and Reentry Vehicles at Launch Complex-39A, Kennedy Space Center. Being located in downtown Titusville we are definitely in the APE for this project and would like to be kept apprised of its progress. It looks like a lot of the historical buildings in this area have already been identified. Our museum does have information on quite a few of the structures in this area. Please feel free to use our resources in any of your investigations. Our normal business hours are Wednesday thru Saturday from 12noon to 4pm. However if you would like access at a different time, please contact me at 321-917-6336.

Pierre Alix
President
North Brevard Historical Society & Museum

On Fri, Dec 20, 2024 at 5:13 PM Zeringue, Katherine S. (KSC-SIE30)
<katherine.s.zeringue@nasa.gov> wrote:

The National Aeronautics and Space Administration's Kennedy Space Center (NASA KSC) is inviting your organization to participate as a Consulting Party, pursuant to Section 106 of the National Historic Preservation Act of 1966, for the Federal Aviation Administration's (FAA) environmental review for the proposed action for the SpaceX Starship and Super Heavy launch and reentry vehicles at Launch Complex-39A (LC-39A). Under the supervision of the FAA's Office of Commercial Space Transportation, SpaceX is preparing an Environmental Impact Statement (EIS) to evaluate the potential impacts of proposed infrastructure construction, and ground, launch, and reentry operations associated with the Starship Super Heavy launch and reentry vehicles at LC-39A. Because SpaceX plans to apply to the FAA's Office of Commercial Space Transportation for a vehicle operator license for Starship Super Heavy, the EIS will conform to the FAA's National Environmental Policy Act (NEPA) implementing policy, FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*, regarding the potential infrastructure construction, ground operations, launch, and reentry-related impacts. NASA KSC is acting as the lead federal agency for compliance with Section 106 of the NHPA. As such, Section 106 will be conducted pursuant to the 2009 *Programmatic Agreement Among the National Aeronautics and Space Administration, John F. Kennedy Space Center, Advisory Council on Historic Preservation, and the Florida State Historic Preservation Officer: Regarding Management of Historic Properties at the Kennedy Space Center*, or any subsequent version thereof.

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Description of the Undertaking

The undertaking involves issuance of a vehicle operator license by the FAA's Office of Commercial Space Transportation that will facilitate ground, launch, and reentry operations associated with the SpaceX Starship Super Heavy at LC-39A. Specifically, this would include up to 44 launches of Starship Super Heavy per year; return of the first stage booster to LC-39A; return of Starship to LC-39A; and construction of an air separation unit for liquid oxygen and liquid nitrogen, onsite natural gas liquefaction production and cryogenic liquid storage capability, roadway improvements, other associated infrastructure, and a catch tower (see **Enclosure 1**).

Area of Potential Effects

The area of potential effects (APE) considers any physical, visual, or auditory effects that the project may have on historic properties^[1]. As such, the APE has been developed to consider both a construction APE and an operational APE. The construction APE is limited within the existing boundaries of LC-39A. Additionally, it is anticipated that proposed new construction associated with the operation of the Starship Super Heavy will be compatible with the characteristic of other launch complex infrastructure and will not pose viewshed effects to historic properties. The operational APE considers the auditory effects of the Starship Super Heavy launch activity as well as the overpressure effects of the sonic boom generated during atmospheric reentry. FAA guidance stipulates consideration of a 130 decibel (dB) threshold for launch effects and a 2.0 pounds per square foot (psf) threshold for effects from the sonic boom. Based on this information, and previous research regarding rocket engine noise and vibration effects to structures, the APE was established as any area subjected to greater than or equal to 2.0 psf sonic booms (see **Enclosure 2, Figure 2**). This area also encompasses the 130 dB threshold for launch effects, as well as the construction APE.

Initial Identification of Historic Properties and Proposed Identification Efforts

The proposed identification approach is designed to make a reasonable and good faith effort to identify historic properties within the APE that may be affected by the undertaking. Effects related to construction will be limited within the footprint of LC-39A. This area has already been subject to survey and evaluation and will not require additional studies. The fieldwork and analysis will therefore focus on historic properties subject to the potential effects of elevated noise and vibrations associated with the undertaking.

The undertaking has the potential to affect historic properties from increased vibratory

impacts. According to data provided by SpaceX, launch and reentry events are estimated to result in Lmax levels of 130 dB and/or sonic boom impacts of 2 psf or higher within the APE. Archaeological resources consisting solely of either surface scatters or subsurface deposits are not likely to be affected by the vibratory effects of increased sonic boom exposure due to the protective qualities of the surrounding soil matrix. Similarly, underwater archaeological sites are unlikely to be affected. However, vibratory effects may be greater on historic age resources within the built environment. Architectural elements most susceptible to damage from launch and reentry vehicle noise include windows and, infrequently, plastered walls and ceilings. Vibration effects may be greatest to non-structural elements such as fragile glass and loose plaster/stone ornamentation. The enclosed memorandum provides additional information on this summation of the potential for vibratory effects on cultural resources (see **Enclosure 2**).

Previously Recorded Resources Within the APE

Historic properties within the construction APE include the Launch Complex 39 Pad A Historic District (**8BR1686**) which is listed in the National Register of Historic Places (NRHP). The historic district is the first of two launch pads constructed by NASA in the 1960s to accommodate the Saturn V launch vehicle for Apollo missions and modified in the 1970s to accommodate the Space Shuttle Program. The historic district contains 23 extant contributing resources all used to support launch operations. One contributing resource, Launch Complex 39 Pad A (**8BR1995**), is also individually listed in the NRHP. No archaeological sites have been recorded or documented within LC-39A.

A preliminary assessment of the operational APE, using data contained in the Florida Master Site File (FMSF), identified 2,964 previously recorded resources, including 2,315 structures, 31 bridges, 465 archaeological sites, 31 cemeteries, and 122 resource groups. Of these, 35 properties are listed in the NRHP and 353 have been evaluated as eligible (see **Enclosure 2**).

Approach for the Identification of Historic Properties

In 2010, NASA KSC completed HAER documentation of the LC-39A historic district and its associated contributing resources. As such, LC-39A is well documented and no further identification or evaluation of LC-39A is proposed.

Identification efforts will focus on historic properties that may be subject to physical damage from elevated noise and vibrations as well as cultural resources whose setting and feeling may be affected by audible and acoustic effects during launch and reentry activities. This will include buildings and structures within the APE that were not specifically designed to withstand the concussive forces of launching and landing spacecraft. Additionally, there are specific types of cultural resources for which aspects of setting and feeling are more likely to represent important components of historic integrity. These types of cultural resources potentially include:

- Designed historic landscapes such as parks and gardens
- Rural historic landscapes with continuity in their traditional use (farming, hunting/fishing, sports/recreation)
- Historic districts
- Historic sites that feature outdoor spaces such as yards and plazas
- Cemeteries

Since the universe of properties in the APE will include many thousands of buildings and structures, identification efforts will focus on properties greater than 45 years of age, in areas that have not been surveyed within the last 10 years, and limited to historic properties and potential historic properties that may reasonably be affected by the undertaking. Previously recorded resources that were determined ineligible for listing in the NRHP will be excluded from further identification and evaluation efforts.

Historic properties will be identified in two ways. First, NASA KSC, supported by SEARCH, will compile an inventory of previously recorded cultural resources within the APE that are listed, eligible for listing, potentially eligible for listing, and unevaluated for listing in the NRHP. NASA KSC will use the FMSF database as well as the Integrated Cultural Resource Management Plans from both KSC and the Cape Canaveral Space Force Station. Additionally, county property appraiser databases will be queried to identify unrecorded historic aboveground resources within the APE. Parcel data contains built year information, which can be cross-referenced with recorded resources to identify parcels that contain structures 45 years old or older without recorded resources. Historic maps and aerial photographs will be used to examine land use and development changes over time, and a historic context will be developed for the APE. Data will be further supplemented with information on unrecorded cultural resources provided by consulting parties and the public. The cumulative data will be used to develop a Geographic Information System heat map within the APE to identify areas with high concentrations of unrecorded structures that are 45 years old or older. These data sets will be used to identify and create a list of properties that will be subject to survey fieldwork. The preliminary inventory data are provided in **Enclosure 2**.

Second, fieldwork will be conducted with three primary objectives:

1. Conduct a windshield survey guided by the heat map discussed above, in order to identify potential historic properties.
2. Complete FMSF documentation for potential historic properties identified during the windshield survey that have a reasonable possibility to be adversely affected by the undertaking. The architectural historians will identify and photograph potential historic properties that appear to embody historic significance established in the historic context. They will also identify and document the character-defining features

that are indicative of NRHP eligibility and that may be susceptible to adverse effects, as discussed in Section 1.2. All newly recorded resources will be assumed NRHP-eligible, for the purposes of Section 106 consultation.

3. Revisit NRHP-listed or eligible historic properties that are individually eligible for the NRHP and that have with a reasonable possibility to be adversely affected to reassess their integrity.

NASA KSC has two requests. First, please provide NASA KSC with any information your organization has about cultural resources within the APE that may need to be a part of the identification effort and/or for which you have concerns regarding project effects. Second, **please respond in writing to confirm your participation as a Consulting Party for this project by January 24, 2025.** If you decline to be a Consulting Party or do not respond by the deadline, no further Section 106 consultation materials will be forwarded to your organization. However, your organization will still have the opportunity to review and comment on materials available to the public on FAA's project website at: https://www.faa.gov/space/stakeholder_engagement/spacex_starship_ksc/.

Cultural resource information and/or Consulting Party participation responses should be emailed to me. If you have any questions or require further assistance, please contact me.

Sincerely,

Katherine Zeringue

Cultural Resources Manager

John F. Kennedy Space Center

Spaceport Integration & Services

Environmental Management Branch, SI-E3

Kennedy Space Center, FL 32899

321-867-8454



[\[1\]](#) Historic property means any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places maintained by the Secretary of the Interior. This term includes artifacts, records, and remains that are related to and located within such properties. The term includes properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization and that meet the National Register criteria. 36 CFR 800.16(l)(1)

From: [North Brevard Historical Society and Museum](#)
To: [Zeringue, Katherine S. \(KSC-SIE30\)](#)
Subject: [EXTERNAL] Re: Response Requested by 1/24/25 -Section 106 Consulting Party Invitation: SpaceX Starship Super Heavy Launch and Reentry Vehicles at Launch Complex-39A, Kennedy Space Center
Date: Thursday, January 23, 2025 3:44:46 PM

CAUTION: This email originated from outside of NASA. Please take care when clicking links or opening attachments. Use the "Report Message" button to report suspicious messages to the NASA SOC.

Katherine,

This is to confirm our participation as a Consulting Party for the SpaceX Starship Super Heavy Launch and Reentry Vehicles at Launch Complex-39A, Kennedy Space Center. Being located in downtown Titusville we are definitely in the APE for this project and would like to be kept apprised of its progress. It looks like a lot of the historical buildings in this area have already been identified. Our museum does have information on quite a few of the structures in this area. Please feel free to use our resources in any of your investigations. Our normal business hours are Wednesday thru Saturday from 12noon to 4pm. However if you would like access at a different time, please contact me at 321-917-6336.

Pierre Alix
 President
 North Brevard Historical Society & Museum

On Fri, Dec 20, 2024 at 5:13 PM Zeringue, Katherine S. (KSC-SIE30)
 <katherine.s.zeringue@nasa.gov> wrote:

The National Aeronautics and Space Administration's Kennedy Space Center (NASA KSC) is inviting your organization to participate as a Consulting Party, pursuant to Section 106 of the National Historic Preservation Act of 1966, for the Federal Aviation Administration's (FAA) environmental review for the proposed action for the SpaceX Starship and Super Heavy launch and reentry vehicles at Launch Complex-39A (LC-39A). Under the supervision of the FAA's Office of Commercial Space Transportation, SpaceX is preparing an Environmental Impact Statement (EIS) to evaluate the potential impacts of proposed infrastructure construction, and ground, launch, and reentry operations associated with the Starship Super Heavy launch and reentry vehicles at LC-39A. Because SpaceX plans to apply to the FAA's Office of Commercial Space Transportation for a vehicle operator license for Starship Super Heavy, the EIS will conform to the FAA's National Environmental Policy Act (NEPA) implementing policy, FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*, regarding the potential infrastructure construction, ground operations, launch, and reentry-related impacts. NASA KSC is acting as the lead federal agency for compliance with Section 106 of the NHPA. As such, Section 106 will be conducted pursuant to the 2009 *Programmatic Agreement Among the National Aeronautics and Space Administration, John F. Kennedy Space Center, Advisory Council on Historic Preservation, and the Florida State Historic Preservation Officer: Regarding Management of Historic Properties at the Kennedy Space Center*, or any subsequent version thereof.

If you are unfamiliar with the Section 106 consultation process or the role of a Consulting

Party, please review the Advisory Council on Historic Preservation's *Protecting Historic Properties: A Citizen's Guide to Section 106 Review* which can be found at: <https://www.achp.gov/protecting-historic-properties>.

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Sincerely,

Katherine Zeringue

Cultural Resources Manager

John F. Kennedy Space Center

Spaceport Integration & Services

Environmental Management Branch, SI-E3

Kennedy Space Center, FL 32899

321-867-8454



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From: Zeringue, Katherine S. (KSC-SIE30)
To: Chase, Kelly L.; Edwards, Scott; Long, Eva (FAA); Akstulewicz, Kevin D. [US-US]; Bill Werner; tim.parsons@searchinc.com; Kim Tice
Cc: nicholas.m.baker@faa.gov; Hanson, Amy (FAA); Edwards, Scott; Sherman, Steven; Quirk, Phillip
Subject: EXTERNAL: RE: SpaceX Starship Superheavy - S106 Approach
Date: Tuesday, November 19, 2024 4:25:00 PM
Attachments: Noise and Sonic Boom Impact Technology Sonic Boom .pdf

Hi Everyone,

Here are some high level notes from today's meeting. If anyone has any corrections or additions, please let me know.

Attendees:

NASA KSC - Katherine

FAA - Eva

SpaceX - Kim

FL SHPO – Kelly, Scott

Contractors (Leidos, ICF, Search Inc.) – Kevin A., Bill, Time, Steve, Phillip

- **Project:** SpaceX Starship Superheavy – Launch and landings at KSC's LC-39A.
 - Any construction related to facilitating Superheavy launches and landings is expected to take place within the confines of LC-39A.
 - Noise generated from this spacecraft is anticipated to be louder than current spacecraft operations.
- **Federal Agency Involvement:**
 - FAA is leading the development of an EIS to facilitate issuance of a launch license to SpaceX for the project. FAA is generally responsible for analysis for any impacts once a vehicle leaves the ground.
 - NASA KSC has agreed to act as the lead federal agency for Section 106 purposes and is supporting FAA as a Cooperating Agency in the development of the EIS. NASA generally has oversight for any on-the-ground infrastructure built or used to facilitate launches and landings.
- **APE:**
 - Two APEs will be established – a construction APE and an operational APE. The construction APE is anticipated to be within the confines of LC-39A. The development of the operational APE will be primarily defined by noise and vibration contours associated with the launch and landing of spacecraft. The noise and vibration analysis is still in development, so the geographic limits of the APE are still in development as well.
 - FAA's standard practice is to use a 2 psf contour when establishing an APE for this type of project. The 2psf contour correlates with sonic booms generated by booster landings and is larger than any anticipated noise/vibration contours generated from launch activities.
 - A 1989 study by Haber and Nakiki informs this approach (see attached) and established thresholds when structural damage may occur. In general, there is a low probability of structural damage within the 2-4 psf contour. Between 4-10 psf, the probability of structural damage increases. Using the 2 psf contour is a conservative approach.

- The 2 psf APE is anticipated to primarily fall within federal lands and over water. However, there will be areas outside of federal lands within Titusville, Merritt Island, and potentially Cocoa Beach that may be within the APE. The 4 psf contour is expected to remain within the boundaries of KSC, or at least within federal lands. The 10 psf is anticipated to be concentrated around the launch and landing area (LC-39A).
- **Identification and Evaluation:**
 - There is the potential for large numbers of non-federal buildings to be present within the APE.
 - The proposed level of effort for identification and evaluation is informed by two factors: 1) the identification of structures, buildings and other property types that are more susceptible to damage within the 2 psf contour (i.e. potential for effect, rather than identifying everything within the APE lines) and 2) those properties susceptible to atmospheric and/or visual effects (e.g. cemeteries).
 - Identification will begin with desktop analysis and supplemented with field survey, as necessary.
 - SHPO wanted to ensure that cumulative effects were taken into consideration when determining which buildings are more susceptible to damage as well as opportunities to weigh in on the research design once it is more clearly defined.
 - SHPO also noted that Tribes may have concerns with noise/vibratory effects to prehistoric burial mounds containing human remains.
- **Schedule:**
 - **Mid-December 2024:** A Section 106 Initiation letter defining the APE, identifying consulting parties, and summarizing the identification/evaluation research design will be sent to FL SHPO, Consulting Parties and Federally-Recognized Tribes.
 - **Early January 2025:** KSC will schedule a follow-up discussion with SHPO approximately 2 weeks after the delivery of the initiation letter. This meeting will take place within SHPO's 30-day review timeframe.

Sincerely,
Katherine Zeringue
Cultural Resources Manager
John F. Kennedy Space Center
Spaceport Integration & Services
Environmental Management Branch, SI-E3
Kennedy Space Center, FL 32899
321-867-8454



-----Original Appointment-----

1/23/25 SpaceX Starship Superheavy SHPO Meeting Summary

Attendees:

- NASA – Katherine Zeringue
- FAA – Eva Long, Amy Hanson, Nick Baker
- SHPO – Alissa Lotane, Kelly Chase
- Consultant Team – Kevin Akstulewicz, Jay Austin, Tim Parsons, Bill Werner, Pam Schanel, Steve Sherman

APE

- SHPO is ok with the APE
- An overview explanation of the APE graphic and the different psf contours:
 - The APE does not depict vibration contours because the 2psf contour, associated with sonic booms, is larger. So the overpressure contour was used to define the APE.
 - There is progressively more overpressure/gradient pressure as you move in toward LC-39A (e.g. from 2 psf to 20 psf).
- What is the difference between overpressure and vibration?
 - Overpressure is considered one impulse/singular event that can affect a resource.
 - Vibration is a more prolonged force that can affect a resource.
 - Overpressure is more of a concern compared to vibration for this project.
 - Discussion of vibratory contours, and associated effects from vibration, will be included in the effects analysis.

Identification and Evaluation

- FAA stated that the identification and evaluation approach is consistent with the standard methodology that the agency uses when conducting Section 106 for airport projects or project with large APEs
- SEARCH provided a quick overview of Identification and Evaluation efforts:
 - Identification is not a 100% sampling survey. Survey efforts are following the methodology outlined in the tech report attached to the consultation package.
 - A heatmap of older neighborhoods based on age of construction was created in GIS
 - Older neighborhoods were prioritized
 - GIS and parcel data was used to identify older/historic areas and to identify specific structures of interest
 - Field verification for all previously recorded resources listed or eligible for NRHP is complete
 - Buildings of historic age that have not been recorded are being identified and will be reviewed within relevant historic contexts
 - Currently 30-40 resources with character-defining features that could be affected by the project have been identified
 - Most of the resources of concern are within the Titusville historic district
- Will SHPO be given an opportunity to comment on the areas identified for desktop or field survey?
 - Yes, NASA would welcome feedback.
 - SHPO indicated they would like to have id/eval materials and then follow up with questions/meetings.

- Will both interior and exterior character defining features be considered in the process?
 - Only exterior character-defining features and windows are being used to identify structures
 - Approach will also look at materials and construction – what features are more susceptible to effects? Wood more stable. Concrete and masonry can be affected more.

Effects and Cumulative Effects

- Built Environment
 - Are these studies taking into account cumulative effects/multiple launch and reentry? FAA has studies on the effects of multiple exposures to structures. This information is critical for and linked to FAA safety information. This information was summarized in the tech report included in the Section 106 package. For example, 1 in 10,000 windows are anticipated to be broken within the 2 psf.
 - FAA's studies provide general observations, but we must keep in mind that each property and its condition is unique. Effects will depend upon how a property is maintained or changed by a homeowner. Properties will also continue to change over time independent of the project.
 - A monitoring program will need to be instituted to address this.
 - There are insurance requirements for companies to address damages if they were to occur.
- SHPO requested a plain English version of an explanation of vibratory and overpressure reports and effects to structures.
- Archaeological Sites
 - Is there water movement that would create effects to archaeological sites along the shoreline?
 - Water is hard and noise/energy bounces off of water. So no waves or water movement would be created that would impact underwater sites or archaeological sites along the shoreline.
 - For terrestrial sites, recent publications cited in the tech study address how the soil matrix is affected by vibration and overpressure. The conclusion of that study is that surface scatters and stratigraphy are not affected. It would only be above ground features outside of a soil matrix that may pose archaeological concern.

Need for an Agreement Document

- We all agree that an agreement will be needed
- The survey team is still doing research but believes the potential for affects is very low. So far, only a handful of buildings has been identified with character defining features that may be affected.
- Affects would likely be to windows and fenestration and not result in structural failure.
- FL SHPO been in contact with TX SHPO regarding SpaceX activities in Texas. SHPO is interesting in a long-term monitoring program. They are concerned with long-term movement of the buildings over time.

Consulting Parties

- SHPO felt we had contacted the appropriate consulting parties.
- Titusville CLG – SHPO will reach out to them and check in. They have accepted Consulting Party status.

SpaceX Starship Super Heavy Meeting February 13, 2025

Attendees:

- **NASA** – K. Zeringue, J. Brooks, D. Dankert, P. Hall
- **ICF on Behalf of FAA** – S. Sherman, P. Schanel
- **SHPO** – K. Chase, S. Edwards, A. Lotane
- **SpaceX** – K. Tice
- **Leidos/SEARCH** – K. Akstulewicz, C. Ward, B. Werner, T. Parsons

Opening Statements:

SEARCH is drafting the Identification, Evaluation and Assessment of Effects report. The identification and evaluation methodology follows the standard FAA approach for these types of projects.

The anticipated schedule and dates, for review and comment on identification, evaluation, and assessment of effects, as agreed to by NASA and SHPO are below:

- Pre-Report SHPO Briefing Meeting: 13 Feb 25
- Deliver “Interim Draft” Report to SHPO for cursory review: 17 Feb 25
- SHPO “Cursory Review”: 18 – 24 Feb 25
- Deliver “Final” report to SHPO for official review: 18 Mar 25

SEARCH Presentation on Identification, Evaluation and Assessment of Effects

- See attached PPT. Below is additional information or clarifications provided during the presentation.
- This is a large-scale identification effort since the APE is around 2 million acres, however most of the APE is not over land.
- The APE accounts for 130 dB associated with launch activities. The 130 dB demarcation is concentrated around LC-39A and is limited in geographic scope. Launch activities have the potential to create sonic booms, but those will occur over water.
- The APE also accounts for 2 psf which is the overpressure from landing activities, which comprises the majority of the APE.
- Overall, potential auditory/vibratory effects are of most concern and will primarily stem from launch and landing activities (operations).
- For archaeological sites with character-defining features of concern, SEARCH read through the entire FMSF site file forms and their associated documentation. They also looked at modern/aerial photographs to determine impacts to sites resulting from development over time.


Questions Asked by SHPO:

- **Q:** Will SHPO get any additional site forms for buildings or archaeological sites because of these survey efforts OR was this only a windshield survey?

- A:** It was a windshield survey, and no site forms are anticipated to be submitted to SHPO.
- **Q:** Since resources previously determined ineligible for NRHP were excluded from survey, what parameters were used to address properties that may require reassessment (e.g. due to the passage of time)?
A: SEARCH did not reassess these properties. However, the survey methodology focused on areas not surveyed within the past 10 years to try to account for this.
SHPO Response: SHPO will look at this during its cursory review and determine if there are any concerns.
 - **Q:** Has anyone had communication with the CLG?
A: NASA nor anyone on the CRM has received any additional communications or information from the CLG. As a result of our meeting with SHPO on January 23, 2025 SHPO stated they would reach out to the CLG to determine if there were any concerns.
SHPO Response: SHPO stated that they needed to follow up on this.
 - **Q:** How was the CLG (and other Consulting Parties) contacted and who contacted them?
A: NASA KSC distributed Section 106 materials to Consulting Parties via email twice and also mailed hard copy letters. NASA KSC will provide information related to CPs who responded and what information they have provided regarding the identification of historic properties. See attached information.

Next Steps:

- Documents will be transmitted by SEARCH via their SharePoint system on Monday.
 - This method is acceptable to SHPO. SEARCH will follow up with a confirmation email to Kelly to ensure the link has been received on Monday.
- SHPO requests the materials be sent with a comment matrix to log their responses.



Results Summary of Historic Properties Identification and Evaluation for SpaceX SSH Activities at LC-39A

February 13, 2025



Overview of Proposed Activities

SpaceX proposes to use LC-39A to support Starship Super Heavy Operations

- Infrastructure at LC-39A.
- Landing SSH and booster at LC-39A on “droneships” in ocean.

Requires Vehicle Operator License from FAA

- Considered Section 106 undertaking.
- NASA KSC is lead federal agency for Section 106.



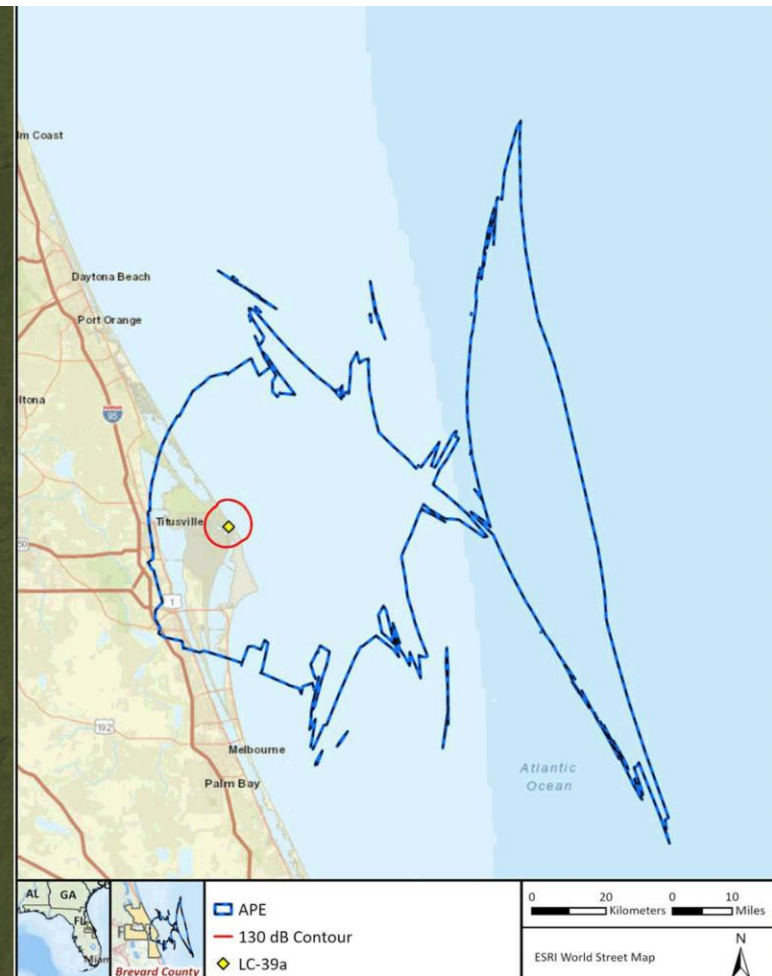
Area of Potential Effects

Construction APE

- Previously surveyed/existing boundary of LC-39A.

Operational APE

- Considers auditory and vibratory effects of launch and landing activities.
- \geq Lmax level at 130 dB for effects from launch.
- \geq 2 pounds per square inch (psf) sonic boom overpressure for effects from reentry.



Potential for Adverse Effects

- **High sound pressure levels and vibrations have the potential to cause adverse effects, though damage from propulsion/engine noise is rare.**
 - Potential effects are greatest to non-structural building elements and may include damage to windows, plastered walls and ceilings, fragile glass, loose plaster mosaics, or pieces of stone.
- **Sonic booms have the potential to cause adverse effects, although this is rare.**
 - Properly installed glass will not break, and plaster is unlikely to be damaged at overpressures below 10 psf.
 - Below 2 psf, building damage in well-maintained structures is unlikely.
- **Effects to archaeological sites are less understood.**
 - Sites consisting of surface scatters or subsurface deposits are unlikely to be affected, based on existing literature.
 - Underwater sites unlikely to be affected, as water is “acoustically dense.”
 - Effects may be greater to sites possessing aboveground structural elements, although the potential for damage is considered low based on existing literature.



Research Design

- Thousands of previously recorded and unrecorded buildings and structures are within the operational APE.
- Identification efforts focused on properties greater than 45 years of age, in areas not surveyed within the last 10 years.
- Identification focused on historic properties and potential historic properties that may reasonably be affected by SSH launch and landing activities (i.e., possess character defining features that may be affected by auditory and vibratory events \geq Lmax level of 130 dB or \geq 2 psf sonic boom overpressure).



Architectural History Methods

- Desktop analysis of previously recorded historic properties (NRHP-listed, eligible, or unevaluated).
- Intensive field survey and windshield survey of NRHP-listed, eligible, and unevaluated resources, FMSF resources within existing Resource Group Boundaries recommended as potentially contributing to an NRHP district, and cemeteries and Resource Groups lacking SHPO determinations to identify character defining features that may be affected.
- Windshield survey for unrecorded resources with characteristics similar to the potentially affected historic properties, focusing on areas where high concentrations of unrecorded resources of historic age were possible based on GIS analysis.
- Resources on Cape Canaveral Space Force Station and NASA KSC were omitted from the study (information on historic properties included in recent ICRMP updates).



Archaeological Desktop Analysis Methods

- FMSF research to identify archaeological sites with character defining features that could be affected by auditory and vibratory effects:
 - Clear aboveground components (precontact mounds, building remains, and/or structures).
 - Sites documented in FMSF as potentially containing human remains.
- Archaeological sites previously evaluated ineligible for NRHP listing by SHPO were excluded.



Architectural History Results Summary: Previously Recorded Resources

- Survey of 92 previously recorded resources, Resource Groups, and cemeteries.
 - 7 no longer extant.
 - 18 NRHP-listed resources/Resource Groups retain integrity.
 - 59 resources eligible for NRHP inclusion, 1 resource eligible as Resource Group contributor, 6 are not eligible for NRHP inclusion, and 1 remains unevaluated (no access).
- Windshield survey of 142 previously recorded resources.
 - 2 no longer extant.
 - 122 eligible as Resource Group Contributors, and 9 eligible for NRHP inclusion.
 - 6 not eligible for NRHP inclusion.
 - 2 cemeteries and 1 Resource Group remain unevaluated (no access).



Architectural History Results Summary: Unrecorded Resources

- Purpose of the windshield survey for unrecorded resources was to identify architectural styles, distinguishing characteristics, and general development patterns, and to reasonably assess potential effects.
- Three areas of historic unrecorded structure concentrations were identified: Titusville North, Titusville South, and Merritt Island.
- Individual structures and Resource Groups were not recorded, but general trends (supported by examples in the report) were documented to inform the potential for adverse effects.



Architectural History Results Summary: Observed General Trends

Titusville North

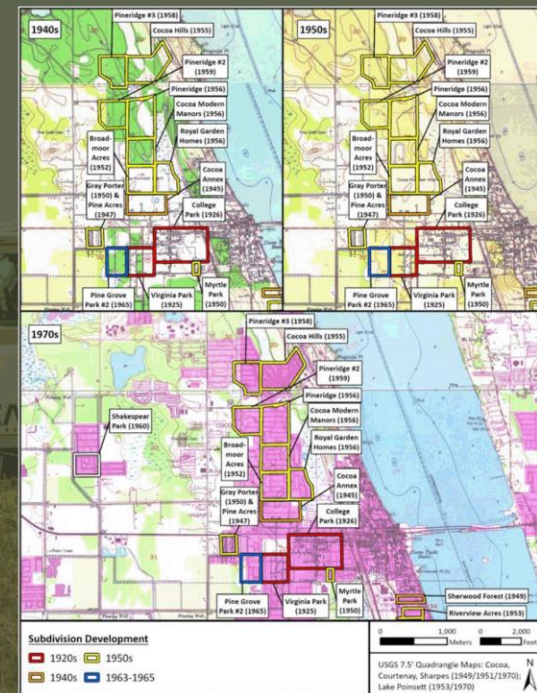
- Heavy post-WWII residential construction beginning in late 1950s.
- Primarily contemporary ranch-style construction, often with changes to fenestration and other features.

Titusville South

- Heavy post-WWII residential construction along US-1
- Less stylistic cohesion than Titusville North.
- Observations include some late 19th- and early 20th-century craftsman style homes, wood frame vernacular homes, and one Spanish Revival residence.
- Most buildings have reduced integrity due to changes to character defining features.

Merritt Island

- Heavy post-WWII residential, commercial, and recreational development.
- Significant post-1950 residential development associated with the growth of the space program.



Archaeological Desktop Analysis Results Summary

- 438 previously recorded sites within APE.
- 347 do not retain above ground components, were determined ineligible for NRHP, or are not suspected to contain human remains.
- 34 sites documented as containing mounds, middens, or site names are suggestive of such.
 - 2 mound sites are NRHP eligible (8BR00086 and 8BR01673). 1 mound site is evaluated as ineligible, but the FMSF indicates may contain human remains (8BR00064).
- 32 sites documented in FMSF as potentially containing human remains.
- 54 sites with confirmed or possible historic-era aboveground components.
 - 33 appear no longer extant based on examination of aerial imagery.
 - 1 site (8BR01872) is NRHP-eligible for foundation remains. 3 other sites are eligible, but for subsurface components.
 - Several other sites contribute to NRHP-listed districts associated with NASA KSC.



Archaeological/Architectural Example: Site 8BR01872 (Sam's Site)

- 11.7 miles southwest of LC-39A.
- Contains 19th-century foundation remnants, and precontact components (Sam's Mound, 8BR0063).
- Site also contains some of the oldest historic structures in Brevard County, and one of the oldest farmsteads/homesteads on Merritt Island, ca. 1875-1883 (8BR0889, 8BR01973).
- Location is county-owned and may be a suitable candidate for a monitoring program.

An aerial map of Merritt Island, Florida, showing the coastline and various land parcels. A red arrow points from the text '8BR01872' to a specific location on the map, marked with a red circle and a red exclamation mark. The map shows a mix of green fields, brown areas, and blue water. A semi-transparent box with the word 'SEARCH' is visible over the map.

8BR01872



Effects Analysis Summary

Archaeology

- Any visual, auditory, or vibratory interruptions to historic setting or feeling are temporary.
- Physical adverse effects to sites within the APE are unlikely, based on available current literature.
- Subsurface components, including burials, are likely protected by the surrounding soil matrix. However, the longitudinal effects of repeated exposure to vibratory events is understudied.
- Sites with significant above-ground components (standing, structural elements) were not identified within the APE, and it is unlikely that features such as foundation remains would be affected.

Architectural History

- Adverse effects to previously recorded structures are possible, though unlikely.
- Adverse effects may include impacts such as broken windows, damage to plaster walls, and other masonry adornments.
- Structural damage to maintained buildings is unlikely.
- Many character defining features of previously recorded and unrecorded structures, resource groups, and neighborhoods have been removed or diminished over time, resulting in integrity loss.



Conclusion and Recommendations

- No adverse effects within construction APE.
- Within operational APE, adverse effects are not likely, but possible.

Because a final determination of how SSH launch and landing activities will affect historic properties is not possible at this time, the development of a Programmatic Agreement to monitor for and mitigate any potential adverse effects is recommended.



From: [Tim Parsons](#)
To: [Chase, Kelly L.](#); [Edwards, Scott](#); [Lotane, Alissa Slade](#)
Cc: [Akstulewicz, Kevin D. \[US-US\]](#); [Zeringue, Katherine S. \(KSC-SIE30\)](#); [Long, Eva \(FAA\)](#); [Bill Werner](#)
Subject: EXTERNAL: SpaceX SSH Section 106 Report DRAFT - Submittal for Comments
Date: Monday, February 17, 2025 9:32:49 AM
Attachments: [Outlook-0ud2c1ti.png](#)
[Outlook-0zr4dxo3.png](#)
[Outlook-l0v0vbad.png](#)
[Outlook-fsvrg3j4.png](#)
[Outlook-vn40wkr.png](#)
[Outlook-afi5bwng.png](#)

CAUTION: This email originated from outside of Leidos. Be cautious when clicking or opening content.

Good morning,

As we discussed last Thursday, the draft SpaceX SSH Section 106 report is available for download and your review. You can access the documents at this link:



If you have any problems accessing the shared folder, please let me know. I have included an Excel comment table for convenience. You should be able to edit the table directly, but again, if you encounter any issues send me a message and I will resolve it.

Thank you again for your initial comments and questions, last week. We look forward to your response, and hope you enjoyed the holiday weekend!

Tim

Timothy Parsons, PhD, RPA
Director
SEARCH Florida - Tallahassee
tim.parsons@searchinc.com 850-766-4088

SEARCH - SEARCH20 Harness the Power of the Past
Archaeology – Maritime Archaeology – Architectural History – Cultural Heritage



From: [Chase, Kelly L.](#)
To: [Zeringue, Katherine S. \(KSC-SIE30\)](#)
Cc: [Akstulewicz, Kevin D. \[US-US\]](#); [Long, Eva \(FAA\)](#); [Bill Werner](#); [Tim Parsons](#); [Edwards, Scott](#); [Lotane, Alissa Slade](#)
Subject: EXTERNAL: Re: [EXTERNAL] Re: SpaceX SSH Section 106 Report DRAFT - Submittal for Comments
Date: Friday, February 28, 2025 4:29:13 PM
Attachments: [image001.png](#)
[image002.png](#)
[image003.png](#)
[image004.png](#)
[image005.png](#)
[image006.png](#)
[image007.png](#)
[image008.png](#)
[SSH Section 106 DRAFT Comment Table_DHR Comments.xlsx](#)

Katherine,

Attached please find our comments regarding the SpaceX Starship Superheavy draft identification, evaluation and assessment of effects report. Please let us know if you have any questions or need clarification.

[Kelly L. Chase](#)

Compliance and Review Supervisor | Deputy State Historic Preservation Officer
Division of Historical Resources | Florida Department of State
Office: 850.245.6344 | Cell: 850.274.9121 (cannot receive text messages)
500 South Bronough Street | Tallahassee, Florida 32399
dos.myflorida.com/historical

From: Zeringue, Katherine S. (KSC-SIE30) <katherine.s.zeringue@nasa.gov>
Sent: Wednesday, February 26, 2025 3:55 PM
To: Chase, Kelly L. <Kelly.Chase@dos.fl.gov>
Cc: Akstulewicz, Kevin D. [US-US] <KEVIN.D.AKSTULEWICZ@leidos.com>; Long, Eva (FAA) <Eva.Long@faa.gov>; Bill Werner <Bill.Werner@searchinc.com>; Tim Parsons <tim.parsons@searchinc.com>; Edwards, Scott <Scott.Edwards@dos.fl.gov>; Lotane, Alissa Slade <Alissa.Lotane@dos.fl.gov>
Subject: RE: [EXTERNAL] Re: SpaceX SSH Section 106 Report DRAFT - Submittal for Comments

EMAIL RECEIVED FROM EXTERNAL
SOURCE

The attachments/links in this message have been scanned by Proofpoint.

Hi Kelly,

Friday should be fine.

Thanks,

Katherine Zeringue
Cultural Resources Manager
Spaceport Integration and Services
Kennedy Space Center
Mail Code: SI-E3

From: [Zeringue, Katherine S. \(KSC-SJE30\)](#)
To: [Lotane, Alissa Slade](#); [Chase, Kelly L.](#); [Edwards, Scott](#); [CompliancePermits](#)
Cc: [Aksulewicz, Kevin D. \[US-US\]](#); [Hanson, Amy \(FAA\)](#); [Long, Eva \(FAA\)](#); [Zee, Stacey \(FAA\)](#); [Bill.Werner@searchinc.com](#); [tim.parsons@searchinc.com](#); [Schanel, Pam](#); [Sherman, Steven](#); [Ward, Carmen J. \[US-US\]](#); [Dankert, Donald J. \(KSC-SJE30\)](#); [Brooks, James T. \(KSC-SJE30\)](#); [Kim Tice](#); [Hall, Patrice \(KSC-SJE30\)](#); [Klein, Rebecca A \(HQ-LD020\)](#); [Thorpe, David B. \(KSC-SIA10\)](#); [Krouchick, Jennifer L. \(KSC-SIA10\)](#); [Tezel, Trevor O. \(KSC-CC000\)](#); [Griffin, Richard T. \(HQ-LD062\)](#); [Kneiff, Kristen R.](#); [PENDERS, THOMAS E NH-03 USSF SSC 45 CES/CEIE](#); [Kanaski, Richard](#); [Penn, Thomas R. \(KSC-USFWS\)\[US Fish and Wildlife\]](#); [Ramos, Keith \(KSC-USFWS\)\[US Fish and Wildlife\]](#)
Subject: EXTERNAL: Continuing Consultation, SpaceX Starship Super Heavy Launch and Reentry Vehicles at Launch Complex-39A, Kennedy Space Center
Date: Monday, March 17, 2025 11:04:00 AM
Attachments: [image001.png](#)
[image002.png](#)
[SpaceX Starship ID Eval Effects SHPO Final.pdf](#)

Dear Ms. Lotane,

The National Aeronautics and Space Administration's Kennedy Space Center (NASA KSC) is continuing consultation with your office pursuant to Section 106 of the National Historic Preservation Act (NHPA) of 1966 as part of the Federal Aviation Administration's (FAA) environmental review of the proposed action for the SpaceX Starship-Super Heavy launch and reentry vehicles at Launch Complex-39A (LC-39A). The undertaking involves issuance of a vehicle operator license by the FAA's Office of Commercial Space Transportation that will facilitate ground, launch, and reentry operations associated with the SpaceX Starship Super Heavy at LC-39A. Specifically, this would include up to 44 launches of Starship Super Heavy per year; return of the first stage booster to LC-39A; return of Starship to LC-39A; and construction of an air separation unit for liquid oxygen and liquid nitrogen, onsite natural gas liquefaction production and cryogenic liquid storage capability, roadway improvements, other associated infrastructure, and a catch tower. As noted in our initiation letter sent on December 20, 2024, NASA KSC is acting as the lead federal agency for compliance with Section 106 of the NHPA.

This letter addresses the identification, evaluation, and assessment of effects for this undertaking. Relevant information can be found in the following sections of the enclosed Cultural Resource Survey for the Starship-Super Heavy Project at LC-39A:

- Methods for the identification of historic properties can be found in Section 5.2. Identification efforts included the following resources:
 - Previously recorded historic resources including cemeteries; and
 - Unrecorded resources; and
 - Archaeological resources.
- Identification results and recommendations for determinations of eligibility can be found in Sections 4.2 and 6.
- A discussion of how historic properties may be affected by the undertaking can be found in Sections 1.1 and 5.1.
- Anticipated findings of effects can be found in Section 6.

NASA KSC agrees with the conclusions and recommendations in the Cultural Resource Survey, including SEARCH Inc.'s eligibility recommendations. However, at this time, NASA KSC cannot make a definitive effect finding of how SpaceX Starship-Super Heavy launch and landing activities will affect historic properties. Evidence suggests that adverse effects resulting from the undertaking are not likely but are possible. Because a final determination of effect is inconclusive, the development of a programmatic agreement to monitor for and resolve adverse effects is proposed pursuant to 36 CFR Part 800.14(b)(1)(ii). The development of this agreement will be done in consultation with your office, Consulting Parties, and federally-recognized Indian Tribes.

Please note:

- Consulting Parties, who accepted the invitation to consult on this undertaking, are identified in this correspondence. Your letter will act as their notification and invitation to review and provide comments on the Cultural Resources Survey (CRAS). Consulting Parties who are not federal agencies will be contacted in a separate email and provided a link to a redacted version of the CRAS. I will copy your office on this notification.
- NASA KSC also continues to consult with federally-recognized Indian Tribes directly.
- **SEARCH Inc. will send you a link to access the CRAS via their SharePoint site as the file is too large to send via email.** Additionally, your office will be mailed a hard copy of the CRAS.

NASA KSC requests your concurrence with our determinations of eligibility as well as the development of a Programmatic Agreement. **We respectfully request a response, and any comments, by April 18, 2025.** If you have any questions or need additional information, please contact me.

Sincerely,



Katherine Zeringue
Cultural Resources Manager
Spaceport Integration and Services
Kennedy Space Center
Mail Code: SI-E3
Kennedy Space Center, FL 32899
O: 321-867-8454
katherine.s.zeringue@nasa.gov

National Aeronautics and Space Administration

John F. Kennedy Space Center
Kennedy Space Center, FL 32899



March 17, 2025

Reply to Attn of: SI-E3

Alissa S. Lotane
Director and State Historic Preservation Officer
Florida Division of Historical Resources
R.A. Gray Building
500 S. Bronough Street
Tallahassee, Florida 32399-0250

Attn: Ms. Kelly Chase, Deputy SHPO
Mr. Scott Edwards, Historic Preservationist

Subject: Continuing Consultation, SpaceX Starship Super Heavy Launch and Reentry
Vehicles at Launch Complex (LC)-39A, Kennedy Space Center (KSC)

Dear Ms. Lotane:

The National Aeronautics and Space Administration's (NASA) KSC is continuing consultation with your office pursuant to Section 106 of the National Historic Preservation Act (NHPA) of 1966 as part of the Federal Aviation Administration's (FAA) environmental review of the proposed action for the SpaceX Starship-Super Heavy launch and reentry vehicles at LC-39A. The undertaking involves issuance of a vehicle operator license by the FAA's Office of Commercial Space Transportation that will facilitate ground, launch, and reentry operations associated with the SpaceX Starship Super Heavy at LC-39A. Specifically, this would include up to 44 launches of Starship Super Heavy per year; return of the first stage booster to LC-39A; return of Starship to LC-39A; and construction of an air separation unit for liquid oxygen and liquid nitrogen, onsite natural gas liquefaction production and cryogenic liquid storage capability, roadway improvements, other associated infrastructure, and a catch tower. As noted in our initiation letter sent on December 20, 2024, NASA KSC is acting as the lead Federal agency for compliance with Section 106 of the NHPA.

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- Anticipated findings of effects can be found in Section 6.

NASA KSC agrees with the conclusions and recommendations in the Cultural Resource Survey, including SEARCH Inc.'s eligibility recommendations. However, at this time, NASA KSC cannot make a definitive effect finding of how SpaceX Starship-Super Heavy launch and landing activities will affect historic properties. Evidence suggests that adverse effects resulting from the undertaking are not likely but are possible. Because a final determination of effect is inconclusive, the development of a programmatic agreement to monitor for and resolve adverse effects is proposed pursuant to 36 CFR Part 800.14(b)(1)(ii). The development of this agreement will be done in consultation with your office, Consulting Parties, and federally-recognized Indian Tribes.

Consulting Parties, who accepted the invitation to consult on this undertaking, are copied on this correspondence. This letter acts as their notification and invitation to review and provide comments on the enclosed materials. NASA KSC also continues to consult with federally-recognized Indian Tribes directly.

NASA KSC requests your concurrence with our determinations of eligibility as well as the development of a Programmatic Agreement. We respectfully request a response, and any comments, within 30 days of receipt. If you have any questions or need additional information, please contact me at 321-867-8454 or Katherine.s.zeringue@nasa.gov.

Sincerely,

Katherine Zeringue
Digitally signed by Katherine Zeringue
Date: 2025.03.17 09:07:28 -04'00'

Katherine Zeringue
NASA KSC Cultural Resources Manager

3

Enclosures:
Cultural Resource Survey for the Starship-Super Heavy Project at LC-39A

cc:
HQS FPO/R. Klein
KSC/SI-E3/D. Dankert
KSC/AD/D. Thorpe
KSD/AD/J. Krouchick
KSC/CC/T. Tezel
KSC/SI-C2/R. Griffin
FAA/E. Long
FAA/A. Hanson
FAA/S. Zee

Consulting Parties:
Canaveral National Seashore/K. Kneifl
Cape Canaveral Lighthouse Foundation/B. Zingarelli
Cape Canaveral Space Force Station/T. Penders
City of Titusville/B. Parrish
Historical Society of North Brevard/P. Alix
U.S. Fish and Wildlife Service/R. Kanaski
North Brevard Heritage Foundation/R. Foster

From: [Zeringue, Katherine S. \(KSC-SIE30\)](#)
To: [museumdirector@canaverallight.org](#); [Roz@callhenry.com](#); [titusvillehistory@gmail.com](#); [brad.parrish@titusville.com](#); [sue.williams@titusville.com](#); [tabitha.armstrong@titusville.com](#)
Cc: [CompliancePermits](#); [Chase, Kelly L.](#); [Edwards, Scott](#); [tim.parsons@searchinc.com](#); [Bill.Werner@searchinc.com](#); [Long, Eva \(FAA\)](#); [Hanson, Amy \(FAA\)](#); [Zee, Stacey \(FAA\)](#); [Akstulewicz, Kevin D. \(US-US\)](#); [Schanel, Pam](#); [Sherman, Steven](#); [Ward, Carmen J. \(US-US\)](#); [Dankert, Donald J. \(KSC-SIE30\)](#); [Brooks, James T. \(KSC-SIE30\)](#); [Hall, Patrice \(KSC-SIE30\)](#); [Kim Tice](#)
Subject: EXTERNAL: Continuing Consultation, SpaceX Starship Super Heavy Launch and Reentry
Date: Monday, March 17, 2025 11:15:05 AM
Attachments: [image001.png](#)
[image002.png](#)
[SpaceX Starship ID Eval Effects SHPO Final.pdf](#)

Dear Consulting Party,

The National Aeronautics and Space Administration's Kennedy Space Center (NASA KSC) is continuing consultation with your organization pursuant to Section 106 of the National Historic Preservation Act (NHPA) of 1966 as part of the Federal Aviation Administration's (FAA) environmental review of the proposed action for the SpaceX Starship-Super Heavy launch and reentry vehicles at Launch Complex-39A (LC-39A). The undertaking involves issuance of a vehicle operator license by the FAA's Office of Commercial Space Transportation that will facilitate ground, launch, and reentry operations associated with the SpaceX Starship Super Heavy at LC-39A. Specifically, this would include up to 44 launches of Starship Super Heavy per year; return of the first stage booster to LC-39A; return of Starship to LC-39A; and construction of an air separation unit for liquid oxygen and liquid nitrogen, onsite natural gas liquefaction production and cryogenic liquid storage capability, roadway improvements, other associated infrastructure, and a catch tower. As noted in our initiation letter sent on December 20, 2024, NASA KSC is acting as the lead federal agency for compliance with Section 106 of the NHPA.

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 - Previously recorded historic resources including cemeteries; and
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- Anticipated findings of effects can be found in Section 6.

NASA KSC agrees with the conclusions and recommendations in the Cultural Resource Survey (CRAS), including SEARCH Inc.'s eligibility recommendations. However, at this time, NASA KSC cannot make a definitive effect finding of how SpaceX Starship-Super Heavy launch and landing activities will affect historic properties. Evidence suggests that adverse effects resulting from the undertaking are not likely but are possible. Because a final determination of effect is inconclusive, the development of a programmatic agreement to monitor for and resolve adverse effects is proposed pursuant to 36 CFR Part 800.14(b)(1)(ii). The development of this agreement will be done in consultation with SHPO, Consulting Parties, and federally-recognized Indian Tribes.

Please note:

- **SEARCH Inc. will send you a link to access the CRAS via their SharePoint site as the file is too large to send via email.**
- You will receive a redacted version of the CRAS in order to protect the location of archaeological sites.

NASA KSC requests comments by April 18, 2025. Please send comments directly to me via email and if you have any questions or need additional information, please contact me.

Sincerely,



Katherine Zeringue
Cultural Resources Manager
Spaceport Integration and Services
Kennedy Space Center
Mail Code: SI-E3
Kennedy Space Center, FL 32899
O: 321-867-8454
katherine.s.zeringue@nasa.gov

Akstulewicz, Kevin D. [US-US]

From: Zeringue, Katherine S. (KSC-SIE30) <katherine.s.zeringue@nasa.gov>
Sent: Thursday, March 20, 2025 9:56 AM
To: e106@achp.gov; Chris Daniel; Bill Marzella
Cc: CompliancePermits@dos.fl.gov; Chase, Kelly L.; Edwards, Scott; Lotane, Alissa Slade; Akstulewicz, Kevin D. [US-US]; Hanson, Amy (FAA); Brooks, James T. (KSC-SIE30); Long, Eva (FAA); Dankert, Donald J. (KSC-SIE30); Kim Tice; Ward, Carmen J. [US-US]; tim.parsons@searchinc.com; Bill Werner; Steven.Sherman@icf.com; Schanel, Pam
Subject: EXTERNAL: Case # 020937: SpaceX Starship Super Heavy Launch and Reentry Vehicles at Launch Complex-39A, Kennedy Space Center
Attachments: 1_15_25 Consulting Parties POC.xlsx; 1_23_25 SpaceX Superheavy SHPO Mtg.pdf; 2_13_25 SpaceX Starship Super Heavy SHPO Meeting.pdf; CapeCanaveral Lighthouse Foundation Inv Ltr.pdf; NASA FAA STOF Tribal Cons Pkg Final.pdf; SpaceX SH Launch.Reentry Final SHPO.pdf; SpaceX SSH KSC ACHP Notification.docx; SpaceX Starship ID Eval Effects SHPO Final.pdf; SpaceX Starship ID Eval Effects STOF Final.pdf; SSH LC-39A Section 106 Tribal Tracker.xlsx; SSH Section 106 DRAFT ID Eval_Comment Table_DHR Comments.xlsx
Categories: Admin Record

Hi Chris,

Attached is the eS106 form and supporting documentation for ACHP Case # 020937: SpaceX Starship Super Heavy Launch and Reentry Vehicles at Launch Complex-39A, Kennedy Space Center. NASA is the lead federal agency for Section 106 for this project. Please note that a link to access the associated Cultural Resource Survey which summarizes our identification, evaluation, and assessment of effects findings and determinations, will be sent to you by SEARCH, Inc. At this time, NASA KSC cannot make a definitive effect finding of how SpaceX Starship-Super Heavy launch and landing activities will affect historic properties. Evidence suggests that adverse effects resulting from the undertaking are not likely but are possible. Because a final determination of effect is inconclusive, the development of a programmatic agreement to monitor for and resolve adverse effects is proposed per 36 CFR Part 800.14(b)(1)(ii).

If you (or Bill) have any questions or need additional information to determine ACHP's participation in the development of the programmatic agreement, please let me know.

Sincerely,



Katherine Zeringue
Cultural Resources Manager
 Spaceport Integration and Services
 Kennedy Space Center
 Mail Code: SI-E3
 Kennedy Space Center, FL 32899
 O: 321-867-8454
katherine.s.zeringue@nasa.gov

Salutation	First	Last	Title	Organization	Street	City	State	Zip	Email
Ms.	Kristen	Kneft	Resource Manager	Canaveral National Seashore	212 S. Washington Ave.	Titusville	FL	32796	kristen_kneft@nps.gov
	Becky	Zingarelli	Museum Director	Cape Canaveral Lighthouse Foundation	PO Box 1978	Cape Canaveral	FL	32935	museumdirector@canaveral.lighthouse.org
Mr.	Tom	Penders	Cultural Resources Manager	Cape Canaveral Space Force Station					thomas.penders@spaceforce.mil
									brad.parrish@titusville.com ; sue.williams@titusville.com ; tabitha.armstrong@titusville.com
Mr.	Brad	Parrish	Community Development Director	City of Titusville	555 South Washington Ave.	Titusville	FL	32796	m
Mr.	Pierre	Alix	President	Historical Society of North Brevard	PO Box 5265	Titusville	FL	32783	titusvillehistory@gmail.com
Mr.	Rick	Kanaski	Regional HPO and Archaeologist	U.S. Fish and Wildlife Service	Merritt Island National Wildlife Refuge				richard_kanaski@fws.gov
Ms.	Roz	Foster	Founder & President	North Brevard Heritage Foundation	PO Box 653	Titusville	FL	32781	roz@calibenny.com

1/23/25 SpaceX Starship Superheavy SHPO Meeting Summary

Attendees:

- NASA – Katherine Zeringue
- FAA – Eva Long, Amy Hanson, Nick Baker
- SHPO – Alissa Lotane, Kelly Chase
- Consultant Team – Kevin Akstulewicz, Jay Austin, Tim Parsons, Bill Werner, Pam Schanel, Steve Sherman

APE

- SHPO is ok with the APE
- An overview explanation of the APE graphic and the different psf contours:
 - The APE does not depict vibration contours because the 2psf contour, associated with sonic booms, is larger. So the overpressure contour was used to define the APE.
 - There is progressively more overpressure/gradient pressure as you move in toward LC-39A (e.g. from 2 psf to 20 psf).
- What is the difference between overpressure and vibration?
 - Overpressure is considered one impulse/singular event that can affect a resource.
 - Vibration is a more prolonged force that can affect a resource.
 - Overpressure is more of a concern compared to vibration for this project.
 - Discussion of vibratory contours, and associated effects from vibration, will be included in the effects analysis.

Identification and Evaluation

- FAA stated that the identification and evaluation approach is consistent with the standard methodology that the agency uses when conducting Section 106 for airport projects or project with large APEs
- SEARCH provided a quick overview of Identification and Evaluation efforts:
 - Identification is not a 100% sampling survey. Survey efforts are following the methodology outlined in the tech report attached to the consultation package.
 - A heatmap of older neighborhoods based on age of construction was created in GIS
 - Older neighborhoods were prioritized
 - GIS and parcel data was used to identify older/historic areas and to identify specific structures of interest
 - Field verification for all previously recorded resources listed or eligible for NRHP is complete
 - Buildings of historic age that have not been recorded are being identified and will be reviewed within relevant historic contexts
 - Currently 30-40 resources with character-defining features that could be affected by the project have been identified
 - Most of the resources of concern are within the Titusville historic district
- Will SHPO be given an opportunity to comment on the areas identified for desktop or field survey?
 - Yes, NASA would welcome feedback.
 - SHPO indicated they would like to have id/eval materials and then follow up with questions/meetings.

- Will both interior and exterior character defining features be considered in the process?
 - Only exterior character-defining features and windows are being used to identify structures
 - Approach will also look at materials and construction – what features are more susceptible to effects? Wood more stable. Concrete and masonry can be affected more.

Effects and Cumulative Effects

- Built Environment
 - Are these studies taking into account cumulative effects/multiple launch and reentry? FAA has studies on the effects of multiple exposures to structures. This information is critical for and linked to FAA safety information. This information was summarized in the tech report included in the Section 106 package. For example, 1 in 10,000 windows are anticipated to be broken within the 2 psf.
 - FAA's studies provide general observations, but we must keep in mind that each property and its condition is unique. Effects will depend upon how a property is maintained or changed by a homeowner. Properties will also continue to change over time independent of the project.
 - A monitoring program will need to be instituted to address this.
 - There are insurance requirements for companies to address damages if they were to occur.
- SHPO requested a plain English version of an explanation of vibratory and overpressure reports and effects to structures.
- Archaeological Sites
 - Is there water movement that would create effects to archaeological sites along the shoreline?
 - Water is hard and noise/energy bounces off of water. So no waves or water movement would be created that would impact underwater sites or archaeological sites along the shoreline.
 - For terrestrial sites, recent publications cited in the tech study address how the soil matrix is affected by vibration and overpressure. The conclusion of that study is that surface scatters and stratigraphy are not affected. It would only be above ground features outside of a soil matrix that may pose archaeological concern.

Need for an Agreement Document

- We all agree that an agreement will be needed
- The survey team is still doing research but believes the potential for affects is very low. So far, only a handful of buildings has been identified with character defining features that may be affected.
- Affects would likely be to windows and fenestration and not result in structural failure.
- FL SHPO been in contact with TX SHPO regarding SpaceX activities in Texas. SHPO is interesting in a long-term monitoring program. They are concerned with long-term movement of the buildings over time.

Consulting Parties

- SHPO felt we had contacted the appropriate consulting parties.
- Titusville CLG – SHPO will reach out to them and check in. They have accepted Consulting Party status.

National Aeronautics and Space Administration

John F. Kennedy Space Center
Kennedy Space Center, FL 32899



Reply to Attn of: SI-E3

Becky Zingarelli
Cape Canaveral Lighthouse Foundation
P.O. Box 1978
Cape Canaveral, FL 32935

Subject: SpaceX Starship Super Heavy Launch and Reentry Vehicles at Launch
Complex-39A, Kennedy Space Center

Dear Ms. Zingarelli:

The National Aeronautics and Space Administration's Kennedy Space Center (NASA KSC) is inviting your organization to participate as a Consulting Party, pursuant to Section 106 of the National Historic Preservation Act of 1966, for the Federal Aviation Administration's (FAA) environmental review for the proposed action for the SpaceX Starship Super Heavy launch and reentry vehicles at Launch Complex-39A (LC-39A). Under the supervision of the FAA's Office of Commercial Space Transportation, SpaceX is preparing an Environmental Impact Statement (EIS) to evaluate the potential impacts of proposed infrastructure construction, and ground, launch, and reentry operations associated with the Starship Super Heavy launch and reentry vehicles at LC-39A. Because SpaceX plans to apply to the FAA's Office of Commercial Space Transportation for a vehicle operator license for Starship Super Heavy, the EIS will conform to the FAA's National Environmental Policy Act (NEPA) implementing policy, FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*, regarding the potential infrastructure construction, ground operations, launch, and reentry-related impacts. NASA KSC is acting as the lead federal agency for compliance with Section 106 of the NHPA. As such, Section 106 will be conducted pursuant to the 2009 *Programmatic Agreement Among the National Aeronautics and Space Administration, John F. Kennedy Space Center, Advisory Council on Historic Preservation, and the Florida State Historic Preservation Officer: Regarding Management of Historic Properties at the Kennedy Space Center*, or any subsequent version thereof.

If you are unfamiliar with the Section 106 consultation process or the role of a Consulting Party, please review the Advisory Council on Historic Preservation's *Protecting Historic Properties: A Citizen's Guide to Section 106 Review* which can be found at: <https://>

www.achp.gov/protecting-historic-properties.

Description of the Undertaking

The undertaking involves issuance of a vehicle operator license by the FAA's Office of Commercial Space Transportation that will facilitate ground, launch, and reentry operations associated with the SpaceX Starship Super Heavy at LC-39A. Specifically, this would include up to 44 launches of Starship Super Heavy per year; return of the first stage booster to LC-39A; return of Starship to LC-39A; and construction of an air separation unit for liquid oxygen and liquid nitrogen, on-site natural gas liquefaction production and cryogenic liquid storage capability, roadway improvements, other associated infrastructure, and a catch tower (see **Enclosure 1**).

Area of Potential Effects

The area of potential effects (APE) considers any physical, visual, or auditory effects that the project may have on historic properties⁽¹⁾. As such, the APE has been developed to consider both a construction APE and an operational APE. The construction APE is limited within the existing boundaries of LC-39A. Additionally, it is anticipated that proposed new construction associated with the operation of the Starship Super Heavy will be compatible with the characteristic of other launch complex infrastructure and will not pose view shed effects to historic properties. The operational APE considers the auditory effects of the Starship Super Heavy launch activity as well as the overpressure effects of the sonic boom generated during atmospheric reentry. FAA guidance stipulates consideration of a 130 decibel (dB) threshold for launch effects and a 2.0 pounds per square foot (psf) threshold for effects from the sonic boom. Based on this information, and previous research regarding rocket engine noise and vibration effects to structures, the APE was established as any area subjected to greater than or equal to 2.0 psf sonic booms (see **Enclosure 2, Figure 2**). This area also encompasses the 130 dB threshold for launch effects, as well as the construction APE.

**Historic property means any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places maintained by the Secretary of the Interior. This term includes artifacts, records, and remains that are related to and located within such properties. The term includes properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization and that meet the National Register criteria. 36 CFR 800.16(l)*

Initial Identification of Historic Properties and Proposed Identification Efforts

The proposed identification approach is designed to make a reasonable and good faith effort to identify historic properties within the APE that may be affected by the undertaking. Effects related to construction will be limited within the footprint of LC-39A. This area has already been subject to survey and evaluation and will not require additional studies. The fieldwork and analysis will therefore focus on historic properties subject to the potential effects of elevated noise and vibrations associated with the undertaking.

The undertaking has the potential to affect historic properties from increased vibratory impacts. According to data provided by SpaceX, launch and reentry events are estimated to result in Lmax levels of 130 dB and/or sonic boom impacts of 2 psf or higher within the APE.

Archaeological resources consisting solely of either surface scatters or subsurface deposits are not likely to be affected by the vibratory effects of increased sonic boom exposure due to the protective qualities of the surrounding soil matrix. Similarly, underwater archaeological sites are unlikely to be affected. However, vibratory effects may be greater on historic age resources within the built environment. Architectural elements most susceptible to damage from launch and reentry vehicle noise include windows and, infrequently, plastered walls and ceilings. Vibration effects may be greatest to non-structural elements such as fragile glass and loose plaster/stone ornamentation. The enclosed memorandum provides additional information on this summation of the potential for vibratory effects on cultural resources (see **Enclosure 2**).

Previously Recorded Resources Within the APE

Historic properties within the construction APE include the Launch Complex 39 Pad A Historic District (**8BR1686**) which is listed in the National Register of Historic Places (NRHP). The historic district is the first of two launch pads constructed by NASA in the 1960s to accommodate the Saturn V launch vehicle for Apollo missions and modified in the 1970s to accommodate the Space Shuttle Program. The historic district contains 23 extant contributing resources all used to support launch operations. One contributing resource, Launch Complex 39 Pad A (**8BR1995**), is also individually listed in the NRHP. No archaeological sites have been recorded or documented within LC-39A.

A preliminary assessment of the operational APE, using data contained in the Florida Master Site File (FMSF), identified 2,964 previously recorded resources, including 2,315 structures, 31 bridges, 465 archaeological sites, 31 cemeteries, and 122 resource groups. Of these, 35 properties are listed in the NRHP and 353 have been evaluated as eligible (see **Enclosure 2**).

Approach for the Identification of Historic Properties

In 2010, NASA KSC completed HAER documentation of the LC-39A historic district and its associated contributing resources. As such, LC-39A is well documented and no further identification or evaluation of LC-39A is proposed.

Identification efforts will focus on historic properties that may be subject to physical damage from elevated noise and vibrations as well as cultural resources whose setting and feeling may be affected by audible and acoustic effects during launch and reentry activities. This will include buildings and structures within the APE that were not specifically designed to withstand the concussive forces of launching and landing spacecraft. Additionally, there are specific types of cultural resources for which aspects of setting and feeling are more likely to represent important components of historic integrity. These types of cultural resources potentially include:

- Designed historic landscapes such as parks and gardens
- Rural historic landscapes with continuity in their traditional use(farming, hunting/

- fishing, sports/recreation)
- Historic districts
- Historic sites that feature outdoor spaces such as yards and plazas
- Cemeteries

Since the universe of properties in the APE will include many thousands of buildings and structures, identification efforts will focus on properties greater than 45 years of age, in areas that have not been surveyed within the last 10 years, and limited to historic properties and potential historic properties that may reasonably be affected by the undertaking. Previously recorded resources that were determined ineligible for listing in the NRHP will be excluded from further identification and evaluation efforts.

Historic properties will be identified in two ways. First, NASA KSC, supported by SEARCH, will compile an inventory of previously recorded cultural resources within the APE that are listed, eligible for listing, potentially eligible for listing, and unevaluated for listing in the NRHP. NASA KSC will use the FMSF database as well as the Integrated Cultural Resource Management Plans from both KSC and the Cape Canaveral Space Force Station. Additionally, county property appraiser databases will be queried to identify unrecorded historic aboveground resources within the APE. Parcel data contains built year information, which can be cross-referenced with recorded resources to identify parcels that contain structures 45 years old or older without recorded resources. Historic maps and aerial photographs will be used to examine land use and development changes over time, and a historic context will be developed for the APE. Data will be further supplemented with information on unrecorded cultural resources provided by consulting parties and the public. The cumulative data will be used to develop a Geographic Information System heat map within the APE to identify areas with high concentrations of unrecorded structures that are 45 years old or older. These data sets will be used to identify and create a list of properties that will be subject to survey fieldwork. The preliminary inventory data are provided in Enclosure 2.

Second, fieldwork will be conducted with three primary objectives:

- 1) Conduct a windshield survey guided by the heat map discussed above, in order to identify potential historic properties.
- 2) Complete FMSF documentation for potential historic properties identified during the windshield survey that have a reasonable possibility to be adversely affected by the undertaking. The architectural historians will identify and photograph potential historic properties that appear to embody historic significance established in the historic context. They will also identify and document the character-defining features that are indicative of NRHP eligibility and that may be susceptible to adverse effects, as discussed in Section 1.2. All newly recorded resources will be assumed NRHP-

eligible, for the purposes of Section 106 consultation.

- 3) Revisit NRHP-listed or eligible historic properties that are individually eligible for the NRHP and that have with a reasonable possibility to be adversely affected to reassess their integrity.

NASA KSC has two requests. First, please provide NASA KSC with any information your organization has about cultural resources within the APE that may need to be a part of the identification effort and/or for which you have concerns regarding project effects. Second, **please respond in writing to confirm your participation as a Consulting Party for this project by January 24, 2025.** If you decline to be a Consulting Party or do not respond by the deadline, no further Section 106 consultation materials will be forwarded to your organization. However, your organization will still have the opportunity to review and comment on materials available to the public on FAA's project website at:

https://www.faa.gov/space/stakeholder_engagement/spacex_starship_ksc/.

Cultural resource information and/or Consulting Party participation responses should be emailed to Katherine.s.zeringue@nasa.gov. If you have any questions or require further assistance, please contact me at 321-867-8454.

Sincerely,

Katherine Zeringue Digitally signed by Katherine
Zeringue
Date: 2025.01.06 12:49:52 -05'00'

Katherine Zeringue
KSC Cultural Resource Manager
Environmental Planning

Enclosures:

1. LC-39A Infrastructure Figure
2. Supplemental Background Information for the SpaceX Starship Super Heavy Launch and Reentry Vehicles Proposed Action at Launch Complex-39A, Kennedy Space Center

cc:

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