National Aeronautics and Space Administration

Integrated Cultural Resources Management Plan for Santa Susana Field Laboratory, Ventura County, California, 2017–2022

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Executive Summary

This Integrated Cultural Resources Management Plan (ICRMP) for Santa Susana Field Laboratory (SSFL) is National Aeronautics and Space Administration's (NASA's) mechanism for complying with historic preservation requirements set forth in Sections 106 and 110 of the National Historic Preservation Act (NHPA) of 1966, as amended, and with the obligations set out in the Programmatic Agreement (PA) executed in April 2014, which was the culmination of the Section 106 consultation process for the demolition, cleanup, and remediation activities evaluated in the *Environmental Impact Statement for Proposed Demolition and Environmental Activities at Santa Susana Field Laboratory, Ventura County, California* (NASA, 2014). Many laws, regulations, and policies guide NASA in its management of cultural resources. Compliance with National Environmental Policy Act (NEPA) and NHPA is central to any actions affecting cultural resources; Public Law PL89-655, as amended through 2014, 16 United States Code 470 et seq. NEPA, among its other goals, states that the federal government will "preserve important historic, cultural, and natural aspects of our national heritage…" (NEPA Section 101[b] [4], 2014). NHPA requires that NASA consider the effect of its actions on cultural resources that are eligible for listing in the National Register of Historic Places (NRHP).

This ICRMP focuses on actions NASA must take to comply with applicable cultural resources protection laws and regulations and the 2014 PA, as well as on actions NASA must take to gain and maintain compliance. This document outlines specific steps and procedures NASA must follow to minimize effects on identified historic properties.

Archeological and historical surveys have been completed for the NASA-administered portions of SSFL. These investigations recorded and evaluated cultural resources for NRHP eligibility. Cultural resources at SSFL include NRHP-listed and -eligible archeological sites, buildings, structures, and districts.

NASA has developed this ICRMP as an internal compliance and management tool. This document supports activities at NASA-administered portions of SSFL and meets the legal compliance requirements of federal historic preservation laws and regulations in a manner consistent with the sound principles of cultural resources stewardship.

This ICRMP establishes priorities and standards for the identification, evaluation, preservation, and mitigation of cultural resources.

Implementation of this ICRMP will help ensure that applicable laws, regulations, Presidential Memoranda, and Executive Orders; the 2014 PA; and other directives are followed in properly implementing NASA's cultural resource management responsibilities. This ICRMP includes a series of policies and standard operating procedures and identifies various public and tribal consultation requirements and how to incorporate them into SSFL activities.

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1. Introduction

The National Aeronautics and Space Administration (NASA) developed this Integrated Cultural Resources Management Plan (ICRMP) to provide decision makers with the necessary information to make appropriate choices for the management of the significant cultural resources in federally-owned and NASA-administered areas of Santa Susana Field Laboratory (SSFL) in Ventura County, California.

NASA initiated National Historic Preservation Act (NHPA) Section 106 consultation with the California State Historic Preservation Office (SHPO) and the Advisory Council on Historic Preservation (ACHP) on June 30, 2011, for cleanup, remediation, and demolition activities at SSFL, for which an Environmental Impact Statement (EIS) was prepared and a Record of Decision published in April 2014. The cleanup and remediation activities are being carried out in preparation for transfer of ownership of SSFL from NASA to the General Services Administration (GSA), who will prepare the property for deaccession from federal ownership. The Section 106 consultation resulted in measures to avoid, minimize, or mitigate adverse effects on historic properties which were codified in the 2014 SSFL Programmatic Agreement (PA). This ICRMP includes the measures stipulated in the PA.

The objectives of the NASA SSFL ICRMP are:

- Integrating historic preservation requirements with NASA decisions that may affect historic properties within SSFL, including facility demolition and other real property or land-use decisions.
- Establishing a compliance procedure with the ACHP and the California SHPO as stipulated in NASA's 2014 PA.
- Providing for the protection and treatment of archeological resources, including establishing:
  - Guidelines for visitors to the identified archeological sites.
  - Requirements for unanticipated discovery of archeological resources.
  - Guidelines for security and protection of the sites.

This ICRMP is designed to assist NASA in identifying procedures to comply with appropriate federal laws and implementing regulations. Among these laws are National Environmental Policy Act of 1969 (NEPA), the NHPA of 1966, and the Archaeological Resources Protection Act (ARPA) of 1979. While these laws are separate and distinct legal mandates, they each have procedural and penalty elements that can be used to halt or delay projects.

This ICRMP applies only to NASA while NASA has administrative authority of federal land at SSFL. The federal real property at SSFL eventually will be transferred out of federal ownership. Disposition of the NASA-administered property at SSFL will be the GSA's responsibility. The GSA, in accordance with federal regulations, will evaluate and mitigate adverse impacts to historic and archeological resources from the property disposition.

1.1 Plan Organization

The Introduction (Part 1) includes information regarding NASA policies, goals of the ICRMP, and information about how to use this document. Preservation Laws and Regulations (Part 2) includes brief summaries of relevant laws, implementing regulations, Executive Orders (EOs), and memoranda regarding cultural resources preservation. The Planning

Level Survey (Part 3) summarizes the facility's history and defines its current activities. It also identifies the range of undertakings at SSFL that can affect cultural resources. Current procedures for managing cultural resources also are reviewed in Part 3. For context, the overview provides brief narratives of the current natural environment, the prehistory and history of SSFL, and the surrounding communities. The Cultural Resources Inventory (Part 4) includes a summary of identified cultural resources on NASA-administered portions of SSFL. In this section, cultural resources are organized by type (that is, archeological sites and historic, architectural, and other resources). This section includes the criteria for establishing significance by which properties are evaluated for the National Register of Historic Places (NRHP). The Management Plan (Part 5) defines cultural resource management responsibilities of the SSFL Cultural Resources Manager (CRM) and provides a set of Standard Operating Procedures (SOPs) that are designed to address routine matters of cultural resources compliance.

A 5-year management plan identifies key objectives and specifies the resources and schedule needed to accomplish these objectives. Finally, there are seven appendices containing relevant information that consist of:

- Acronym List (Appendix A)
- Glossary (Appendix B)
- Curation of Federally Owned and Administered Archaeological Collections (Appendix C)
- National Aeronautics and Space Administration's 2014 Programmatic Agreement (Appendix D)
- NASA Procedural Requirements (Appendix E)
- Worker Environmental Awareness Training (Appendix F)
- Environmentally Sensitive Areas Action Plan (Appendix G)

This ICRMP is designed to be a "living" document of contemporary and practical use to SSFL personnel. As the objectives of this 5-year plan are accomplished, new information about SSFL's cultural resources will be obtained and recorded. The entire ICRMP should be reviewed at the end of a 5-year cycle to evaluate whether revisions or corrections are needed. Additional updates to this ICRMP are required as a part of the 2014 PA, which may occur prior to the end of the 5-year cycle.

2. Laws and Regulations

2.1 Introduction

Cultural resources are regulated by various federal laws and regulations, which are implemented through NASA Policy Directives (NPDs) and NASA Procedural Requirements (NPRs) and in accordance with the 2014 PA signed by NASA, SHPO, and ACHP. This section provides an overview of federal statutes and regulations that are applicable to the management of cultural resources.

2.2 Federal Laws and Regulations

2.2.1 National Environmental Policy Act of 1969

NEPA (Public Law 91-190, 42 United States Code (U.S.C.) 4371 et seq.), requires federal agencies to consider the environmental effects of their proposed programs, projects, and actions prior to initiation. Pursuant to NEPA and the Council on Environmental Quality regulations (40 Code of Federal Regulations [CFR]1500–1508), the Proponents of NASA actions will ensure that cultural resources are fully considered when preparing NEPA documents. NEPA documents will include a comprehensive assessment of the impacts of proposed NASA actions or activities on cultural resources. However, compliance with NEPA for a specific action does not relieve NASA of the independent compliance procedures associated with applicable cultural resources requirements. Information and findings obtained through compliance with cultural resources statutes, regulations, EOs, and Presidential Memoranda should be integrated into the concurrent NEPA compliance process and documentation.

Impact assessments under NEPA must consider the effects of proposed federal actions on cultural resources and the effects on Native American tribes, Native Hawaiian Organizations, Native Alaskans, and other ethnic and social communities to whom the cultural resources may have importance. The information needed to make such impact assessments may be acquired from information developed as a result of compliance with cultural resources statutes, regulations, and EOs.

2.2.2 National Historic Preservation Act of 1966

NHPA (PL 89-655, as amended, 16 U.S.C. 470 et seq.) establishes the federal government's policy to provide leadership in the preservation of historic properties and to administer federally owned or controlled historic properties in a spirit of stewardship. Under Section 106 of NHPA, NASA will manage and treat historic properties affected by undertakings.

Section 101 of NHPA prescribes how state, local, and Indian tribal governments participate in the National Historic Preservation Program; establishes how the NRHP is maintained and expanded; and directs the Department of the Interior to promulgate various standards and guidelines, including regulations requiring federal agencies to place recovered artifacts and any records in institutions that have adequate long-term curatorial capabilities.

Section 106 of NHPA requires federal agencies to take into account the effects of their activities on historic properties. 36 CFR Part 800, Protection of Historic Properties, implements Section 106 of the NHPA. This regulation requires compliance through a process of identification; consultation; and execution and implementation of agreements about how adverse effects will be addressed. The Section 106 process must be followed in planning any activity and in the ongoing management of installations. NASA should consult the SHPO, the Tribal Historic Preservation Officers, and, if necessary, the

ACHP before beginning any undertaking that might affect historic properties. Consulted parties must be afforded a reasonable opportunity to comment.

Section 110 requires federal agencies to designate qualified federal preservation officers (FPOs); to locate and inventory historic properties; to give preference to the use of historic properties for mission purposes; and to establish and implement a historic preservation program that includes identification of historic properties, planned management of such properties, and specific procedures for compliance with Section 106.

Section 111 requires federal agencies to "establish and implement alternatives for historic properties, including adaptive use" before leasing or exchanging historic property. The intent of this section is to "ensure the preservation of the historic property."

Section 112 requires a federal agency's employees or contractors to meet professional qualification standards published by the Secretary of the Interior.

Section 304 allows federal agencies, in consultation with the Secretary of the Interior, to withhold from disclosure to the public information relating to the location or character of historic resources when it is determined that such information would result in a significant violation of privacy, endanger the ability of a Native American group to exercise its religion, or create a substantial risk of harm, theft, or destruction. This section most frequently applies to archeological sites and places of traditional religious value to Native Americans; however, locations are not universally withheld, and the need to withhold them must be balanced against the need of regulatory agencies and the public to know such locations to participate in project review under Section 106, NEPA, and other authorities.

2.2.3 Antiquities Act of 1906

The Antiquities Act of 1906 (PL 59-209; 16 U.S.C. 431, 432, and 433) allows the President of the United States (U.S.) to set aside federal lands as historic landmarks. It also allows the federal government to acquire private land for historic preservation. The Act requires that qualified individuals conduct excavation of archeological sites on federal land under federally issued permits and requires permanent preservation of artifacts and objects recovered from these excavations in museums.

The Act establishes penalties for any person who excavates, injures, or destroys any historic property on federal land without permission from the appropriate federal agency. Instructions for seizure of illegally acquired archeological objects are provided in implementing regulation 43 CFR Part 3. The procedure for issuing federal permits has largely been given over the permits issued under the ARPA (Section 2.2.5).

2.2.4 Archaeological and Historic Preservation Act of 1974

The Archaeological Historic Preservation Act (AHPA) (also known as the Moss-Bennett Act, or the Archaeological Data Preservation Act) (PL 85-532, 16 U.S.C. 469-469c) was passed as a revision and amendment to the Reservoir Salvage Act of 1960. The AHPA specifically provides for the survey and recovery of scientifically significant data that may be irreparably lost as a result of any alteration of the terrain from any federal construction projects or federally licensed project, activity, or program.

When a federal agency finds (or is notified in writing by an appropriate authority) that its activities may cause irreparable loss or destruction of significant scientific, archeological, or historical resources, the agency is required to notify the Secretary of the Interior in writing and is to provide information concerning the activity, in accordance with the

AHPA. Upon this notification, the Secretary of the Interior will, if he or she determines that such data are significant, and after reasonable notice to the installation responsible for the activity, conduct or cause to be conducted a survey and other investigation of the affected area and recover and preserve such data.

The AHPA provides federal agencies with the authority to assist the Secretary of the Interior with funds for surveys or other activities to recover significant scientific data, but such financial assistance is not required. Likewise, federal agencies may choose to undertake such professional survey and recovery activities themselves with funds appropriated for the project, program, or activity.

2.2.5 Archaeological Resources Protection Act of 1979

Like the 1906 Antiquities Act, the ARPA (PL 96-95, 16 U.S.C. 470aa-470mm) prohibits the excavation, collection, removal, and disturbance of archeological resources (as defined by the ARPA) and objects of antiquity (as referenced in the Antiquities Act) on federally owned property without a permit issued by the appropriate federal agency. Those permitted must be qualified individuals, and the proposed recovery of archeological resources must be undertaken strictly for the purpose of furthering archeological knowledge. Permits also must require that the excavated archeological artifact collection and associated records permanently be curated in a facility that meets the requirements of 36 CFR Part 79. Permits are not necessary for archeological work conducted in support of mission requirements (in compliance with NHPA Section 106).

Violation of the ARPA may result in the assessment of civil or criminal penalties and forfeiture of vehicles and equipment that were used in connection with the violation.

Federal agencies may withhold any information pertaining to the location of archeological sites if the agency determines that disclosing such information would put the resource at risk. The ARPA specifically excludes such information against a Freedom of Information Act filing that includes all archeological resources, not just those that are NRHP listed or eligible. Federal agencies must develop plans for surveying lands not scheduled for specific undertakings, record and report archeological violations, and develop public awareness programs.

ARPA regulations (43 CFR Part 7) for the ultimate disposition of materials recovered as a result of permitted activities state that archeological resources excavated on public lands remain the property of the U.S. However, under the Native American Graves Protection and Repatriation Act (NAGPRA) (Section 2.2.6), materials may be the property of a culturally affiliated tribe and those materials excavated from Indian lands remain the property of the Indian or Indian tribe having rights of ownership of such resources.

2.2.6 Native American Graves Protection and Repatriation Act of 1990

NAGPRA (PL 101-601, 25 U.S.C. 3001-3013) sets forth rules for intentional excavation and removal of Native American cultural items including human remains, sacred objects, or items of cultural patrimony, and for inadvertent discovery of such items. The intent of NAGPRA is to identify proper ownership and to ensure the rightful disposition of human remains and specific cultural items (defined in Section 2 of NAGPRA) that are in federal possession or control.

The act requires federal agencies to inventory collections of human remains and funerary objects and to provide the culturally affiliated tribes with a collection inventory, requires repatriation on request to the culturally affiliated tribe, and makes illegal the sale or purchase of Native American human remains found on federal or Native American lands. Under

NAGPRA, Section 3(d), an agency must wait a mandatory 30 days before resuming a project even if the items found are minor or insignificant.

2.2.7 American Indian Religious Freedom Act of 1978

Under the American Indian Religious Freedom Act (AIRFA) (PL 95-341, amended 1994 as PL 103-344; 42 U.S.C. 1996 et seq.), NASA will develop and implement procedures to protect and preserve the American Indian, Eskimo, Aleut, and Native Hawaiian right of freedom to believe, express, and exercise their traditional religions, including, but not limited to, access to sacred sites, use and possession of sacred objects, and freedom to worship through ceremonials and traditional rites. Federal agencies also will establish procedures to facilitate consultation with federally recognized Indian tribes and Native Hawaiian organizations, as appropriate.

2.2.8 Curation of Federally Owned and Administered Archaeological Collections (36 CFR Part 79)

The effective and efficient care of archeological collections generated by public projects is a responsibility of many federal and other public agencies. These regulations, found in 36 CFR Part 79, establish the definitions, standards, procedures, and guidelines to follow in preserving collections of prehistoric and historic remains. The federal agency will ensure that all "collections," as defined in 36 CFR Part 79.4(a), are processed, maintained, and curated in accordance with the requirements of 36 CFR Part 79. However, as noted previously, NAGPRA cultural items and human remains in the possession and control of a federal agency will be disposed of in a manner consistent with the requirements of NAGPRA and 43 CFR Part 10.

NASA archeological collections may be processed, maintained, and curated on and by NASA; by another federal agency, state agency, or other outside institution or nongovernmental organization, in cooperative repositories maintained by or on behalf of multiple agencies; or in other facilities, under contract, cooperative agreement, or other formal funding and administrative arrangement provided that the standards of 36 CFR Part 79 are met. Generally, NASA should not establish archeological curation facilities at individual Centers due to the permanent recurring costs and personnel requirements to maintain such repositories to the minimum standards in 36 CFR Part 79 in perpetuity. Prior to NASA's approval of the establishment of an on-post archeological curation facility, a cost analysis will be conducted and included as a primary factor in the decision. The cost analysis will include factors such as professional curatorial personnel costs for the installation, initial installation infrastructure startup costs to establish the facility, and installation costs for annual operation, materials, maintenance, and repair. These installation cost factors should be compared with similar costs associated with curating the materials in an outside facility such as at a state museum, other federal or state agency, or with a nongovernmental organization.

NASA Center directors will establish procedures to minimize the amount of archeological "material remains," as defined in 36 CFR Section 79.4(a)(1), that are collected during archeological inventory and site excavation and that are permanently curated. Such procedures will be integrated into any SOPs and contracts or cooperative agreements for such activities and will serve to reduce the long-term costs associated with archeological materials curation requirements. Such procedures will recognize that all archeological material remains recovered from fieldwork need not be accessioned into the Center collection and permanently curated. Archeological material remains recovered during field inventory and site identification efforts should be analyzed and recorded, but should be

evaluated prior to accessioning into the permanent Center archeological collection. For artifacts recovered from more extensive excavations (such as site evaluation for NRHP eligibility and data recovery excavations and mitigation), some classes of material remains may be analyzed and recorded, but not permanently accessioned into the Center collection. Permanent curation should be reserved for diagnostic artifacts and other significant and environmentally sensitive material that will add important information to site interpretation. Evaluation of materials for curation should be carried out in consultation with the SHPO.

2.3 Executive Orders and Presidential Memoranda

2.3.1 Executive Order 11593

EO 11593 Protection and Enhancement of the Cultural Environment, dated May 13, 1971, establishes a national policy to preserve and maintain the historic and cultural environment of the U.S. The EO directs federal agencies to administer historic properties under their control to preserve the resources for future generations. This EO essentially was incorporated into the 1980 amendments to NHPA as Section 110 and was further revised during the 1992 amendment to NHPA. Federal agencies must locate, inventory, and nominate all potentially eligible sites, buildings, districts, and objects under their control to the Secretary of the Interior for listing on the NRHP. The federal agencies also must take precautions to prevent the sale, transfer, or demolition of historic properties. Any property that will be damaged as a result of a federal undertaking must be fully assessed and documented before it is affected. The agencies must report their efforts to the Secretary of the Interior.

2.3.2 Executive Order 13007

EO 13007 Indian Sacred Sites, dated May 24, 1996, requires federal agencies to allow access to and ceremonial use of sacred Indian sites by Indian religious practitioners of federally recognized tribes. Agencies will maintain confidentiality regarding the location of such sacred sites and will avoid adversely affecting their integrity.

2.3.3 Executive Order 13287

EO 13287 Preserve America, dated March 3, 2003, establishes a national policy for federal government leadership in preserving America's heritage through active advancement of the protection, enhancement, and contemporary use of the historic properties owned by the federal government. This EO also promotes intergovernmental cooperation and partnerships for the preservation and use of historic properties. Through specific steps and deadlines, the EO reemphasizes current requirements for assessment of the status of agency-controlled historic properties (under Section 110 of NHPA) and management needs and suitability of these historic properties for contributing to community economic development initiatives, including heritage tourism.

2.3.4 Presidential Memorandum, Government-to-Government Relations with Native American Tribal Governments

Presidential Memorandum, Government-to-Government Relations with Native American Tribal Governments, dated April 29, 1994, requires that the consultation occur between a federal agency and federally recognized Indian tribes on a government-to-government basis and in an open and candid manner. Consultation with federally recognized Indian tribes on a government-to-government basis occurs formally and directly between NASA and heads of federally recognized tribal governments. Center directors establish government-to-government relations with federally recognized Indian tribes by means of formal, written letters to the heads of tribal governments. Such letters should designate a NASA Center Coordinator for Native American Affairs who is authorized

to conduct follow-on consultations with designated representatives of the tribal government. Any final decisions regarding installation plans, projects, programs, or activities that have been the subject of government-to-government consultation will be formally transmitted from the NASA Center Director to the head of the tribal government. This Presidential Memorandum also requires that the NASA Center directors assess the impact of their plans, projects, programs, and activities on tribal trust resources and ensure that tribal government rights and concerns are considered during the development of such plans, projects, programs, and activities.

2.4 NASA Procedural Requirements

This section summarizes the NPRs, which are also included in Appendix E.

2.4.1 NASA Procedural Requirements 4310.1: Identification and Disposition of NASA Artifacts

Under NPR 4310.1, the National Air and Space Museum (NASM), which is administered by the Smithsonian Institution, is responsible for the custody, protection, preservation, exhibition, and loan of artifacts received from government agencies. Repositories for NASA artifacts are identified with the assistance of the NASM to most effectively inform the public regarding NASA's endeavors. Artifacts are offered to the NASM when programmatic utility to NASA has been exhausted.

2.4.2 NASA Procedural Requirements 8580.1: Implementing the National Environmental Policy Act and Executive Order 12114

The preface of NPR 8580.11 (effective November 26, 2001, expiration November 26, 2010) states:

"In support and promotion of NASA's Strategic Plan, NASA's Strategy for Environmental Excellence in the Twenty-First Century, and NPD 8500.1, NASA Environmental Management, and consistent with the requirements of the (NEPA)…, The Council on Environmental Quality Regulations for Implementing the Procedural Provisions of NEPA (40 CFR Parts 1500-1508), and NASA's regulations (14 CFR Part 1216 Subpart 1216.3), this NASA Procedures and Guidelines (NPR) establishes standard procedures for implementing NEPA and NASA's overall environmental planning process."

The Preface further states: "This NPR establishes responsibilities, procedures, and guidelines for carrying out the requirements of NEPA, its implementing regulations, and EO 12114, Environmental Effects Abroad of Major Federal Actions. The requirements of NEPA, its implementing regulations, and, if applicable, EO 12114 must be satisfied before an action can be taken that would: (a) have an adverse environmental impact or (b) limit the choice of reasonable alternatives."

2.4.3 NASA Policy Directive 8500.1A: NASA Environmental Management

NPD 8500.1B (NPD 8500.1A, effective April 6, 2000, expiration April 6, 2009, new NPD 8500.1B expiration April 2012) states that "NASA's Environmental Management Division is responsible for enabling the success of Agency missions, services, and activities, as defined in the NASA Strategic Plan, while maintaining environmental stewardship of assets, controls over environmental responsibilities, and compliance with applicable law."

2.4.4 1989 Programmatic Agreement

In 1989, a PA was signed among NASA, the National Conference of State Historic Preservation Officers, and the ACHP regarding the management of NASA's National Historic Landmarks (NHLs). The Agreement stipulates that NASA will consult with and obtain approval from the SHPO prior to dismantling or

significantly affecting designated NHLs. Currently, there are no NHLs at SSFL.

2.4.5 2014 Programmatic Agreement

In April 2014, NASA entered into a PA with the California SHPO and the ACHP to codify the appropriate measures to mitigate the adverse effects from the remediation of NASA property at SSFL. The PA stipulates actions that must be taken during, prior to and after the undertaking to address the adverse effects on historic properties from the cleanup and remediation activities. Table 1 lists the PA stipulations. For more information on the specific stipulations, the PA is provided in Appendix D.

Table 1. PA Stipulations

Stipulation	Stipulation Text Summary
I.A.1	Immediate Demolition. Upon completion of the EIS, NASA will demolish all non-historic properties, including all non-contributing historic structures within the NASA SSFL historic districts and NASA will demolish the entirety of the Coca Test Stand Historic District.
I.A.2	Items for Display. Prior to demolition of any test stands, NASA will consult with NASA's artifacts officer and the Signatories and Invited Signatories to identify several special or representative pieces of the test stands for display in local museums or through the NASA artifacts module.
I.A.3	Monitoring. NASA's archeologist in consultation with SYBCI will identify locations where demolition activities may require monitoring by Native American and archeological monitors. NASA will use Native American and archeological monitors to oversee ground-disturbing work in areas of archeological concern.
I.B.1	Retention. NASA will retain and preserve one of the remaining test stands and control houses and possibly other contributing elements within the related historic district.
I.B.2	Consultation. NASA will consult with SYBCI, DTSC, and SHPO to choose which test stand and control house and contributing elements will remain, based on the following criteria: a. Meeting the 2010 AOC conditions; or b. Abatement, operations, and maintenance costs; or c. NASA, SYBCI, or SHPO provides input that identifies concerns related to impacts to the TCP.
I.B.3	Hazardous Materials Identification. Within one (1) year of the execution of this PA, NASA will conduct a cost estimate for the abatement (including full abatement and/or encapsulation) for the Alfa and Bravo historic districts.
I.B.4	Retained Property Identification. NASA will identify one test stand and associated control house at a minimum and other contributing historic properties if feasible to preserve/retain. NASA will notify the Consulting Parties which facilities will be retained.
I.B.5	Proviso: If NASA's efforts fail to retain a test stand and control house due to constraints posed by execution of the AOC or reasons outside of NASA's control, NASA will retain several representative pieces of demolished test stands for display in local museums or through the NASA artifacts module.
I.B.6	Fencing. Upon completion of soil cleanup and demolition activities, NASA will provide and maintain a fenced enclosure around any test stand(s) not demolished until the property is transferred.
I.C.1	Structural Documentation. Within six (6) months of the execution of this PA, NASA will engage the NPS to complete HAER Level I documentation of all test stands in Alfa, Bravo, and Coca Test Area Historic Districts and will complete HAER Level II documentation for control houses within each district, and HAER Level III for all remaining contributing structures.

Table 1. PA Stipulations

Stipulation	Stipulation Text Summary
I.C.2	Photography and Narrative. NASA will post on the NASA website within two (2) years a collection of historic photos and the historic narrative and will provide the same in an appropriate format that will be available upon written request to NASA for five (5) years.
I.C.3	NRHP Determination of Eligibility. NASA will update the NRHP Determination of Eligibility for the retained test stand and control house and any other facilities retained upon completion of all demolition activities within 12 months of finalization of the decision to retain structures.
I.C.4	Video Documentation. Within twenty-four (24) months of the execution of the PA, NASA will produce a video documenting the history of the construction and use of NASA's SSFL test stands; the video will be posted on NASA's website for three (3) years minimum and available on CD by request for up to three (3) years.
I.C.5	Oral Histories. Within twenty-four (24) months of the execution of the PA, NASA will conduct twelve (12) oral history interviews of personnel who formerly worked at NASA SSFL and will include the transcripts on NASA's oral history website http://www.jsc.nasa.gov/history/nasa_history.htm with links to other NASA websites, including SSFL.
II.A.	Native American Advisory Board. Within six (6) months of execution of this PA, NASA will establish a Native American Advisory Board (NAAB) comprising volunteer representatives from federally recognized Indian tribes and state-listed tribes with an interest in the sites on NASA SSFL to advise NASA on matters of interest to Native Americans on NASA SSFL.
II.B	Ethnographic History. Within thirty-six (36) months of execution of this PA, NASA will conduct an ethnographic history, which will include in-depth research of archeological investigations in the area, interviews, and other research methods to provide a greater understanding of the historic use and associations of the area.
II.C	TCP Nomination. In consultation with SHPO, Boeing, DOE, NAAB, SYBCI, and NPS, NASA will produce and submit a NRHP nomination to the California State Historic Resources Commission and the NRHP within eighteen (18) months of the completion of the ethnographic history.
II.D	Access. In accordance with Executive Order 13007, Indian Sacred Sites, NASA will continue to provide access to ceremonial sites for Native Americans. Written requests for access will be processed by NASA until the land is transferred to the next owner
II.E	Reseeding. NASA will backfill a portion of the removed soil and reseed areas affected by cleanup and demolition activities using a native seed mix similar to the seed mix being used on the adjacent Boeing property.
III.A	Boundary Determination: Prior to any cleanup excavation activities on the NASA Property, NASA will consult with SHPO to identify a testing plan to conduct archeological investigations within NASA's boundary to confirm the Burro Flats boundary on NASA land. NRHP Nomination. Within twelve (12) months of publishing the final report, NASA will develop an updated NRHP nomination form to be submitted to the SHPO and NRHP.
III.B	Monitoring. NASA will use archeological and Native American monitors to oversee field sampling, vegetation clearing, and ground disturbing activities within Burro Flats site and the buffer area defined by NASA in 2008 for management purposes, as well as within any other known archeological sites.
III.C	Environmentally Sensitive Areas Action Plan. NASA will develop an Environmentally Sensitive Areas Action Plan (ESAAP) for use by NASA and its contractors for sensitive cultural areas such as archeological sites. The ESAAP will delineate areas to be protected, document protective measures required, identify responsible parties and their appropriate tasks, and outline an anticipated schedule and process.

Table 1. PA Stipulations

Stipulation	Stipulation Text Summary
III.D	AOC Exception Consideration. Prior to commencing the soil cleanup activities in and around Burro Flats, NASA will submit to DTSC the revised Burro Flats site boundary that lies within NASA's APE and request that any cleanup required to meet DTSC standards within the Burro Flats site be considered part of the "Native American Artifacts" exceptions clause identified in the AIP of the AOC and be exempted from the cleanup requirement.
III.E	Exemption Override. If DTSC determines that there is an unacceptable health risk that requires environmental cleanup within the Burro Flats site, even in view of an exception otherwise available, NASA and DTSC will identify which areas will require cleanup to meet the prescribed health risk identified by DTSC. NASA will determine the most effective cleanup methodology to achieve the goals while being as sensitive as possible to the site, and promptly inform the SYBCI and SHPO of their determination in writing.
III.F	Data Recovery Consideration. If the cleanup requires excavation within the Burro Flats site, NASA will promptly notify the NAAB, SHPO, and SYBCI that it intends to develop a Research Design for a Phase III data recovery plan.
III.F.1	Research Design: NASA will consult with the NAAB, SHPO, and SYBCI to develop a Research Design for a Phase III data recovery plan, which will include a provision for Native American monitors.
III.G	Documentation and Curation. NASA shall ensure that records from excavation of NRHP-eligible archeological site(s) are curated by an institution meeting the standards in 36 CFR 79, and that artifacts and other material resulting from the same excavation are maintained in accordance with 36 CFR 79 and curated with previous federal collections associated with SSFL within California.
III.H	Protection. NASA will update its Standard Operating Procedures (SOP) for Archeological Resource Protection Act Compliance Review and Preventing Vandalism to Archeological Sites in its ICRMP to include protection during demolition and cleanup activities, and the update will be submitted by NASA to SYBCI and SHPO.
IV.A	Field Sampling. NASA will provide archeological and Native American monitors for field sampling conducted to identify soil contaminants within NASA SSFL.
IV.B	Further Archeological Investigation. Within six (6) months of the completion of the final environmental field sampling or testing, NASA will commence Extended Phase I archeological investigations in those footprints of cleanup areas where NASA plans to excavate soil to achieve cleanup goals.
IV.C	Archeological Site Discovery and Evaluation. Any newly identified archeological sites within the Extended Phase I investigations will be evaluated by NASA in accordance with 36 CFR 63 and bulletins, guidance, and documents produced by the NPS, in consultation with NAAB, SHPO, and SYBCI, to determine if they are historic properties. NASA will submit the report for review to SHPO, NAAB, DTSC, and SYBCI.
IV.D	In the event the final cleanup footprint includes a portion of the Sparse Lithic Scatter (CA-VEN-1803) or an archeological site is found meeting the NRHP eligibility criteria within the final footprint of other cleanup areas, or NASA determines the site eligible for the NRHP for the purposes of this Undertaking, NASA will consult with DTSC and request that the site be considered part of the "Native American Artifacts" exceptions clauses identified in the AIP of the AOC and be exempted from the cleanup requirement.
IV.E	ICRMP Updates. NASA will update its SSFL ICRMP to include the NRHP-eligible site(s), should they exist, and to include in the ICRMP protection measures during demolition and cleanup for newly identified sites. The updated ICRMP will be submitted by NASA to SYBCI and SHPO.

Table 1. PA Stipulations

Stipulation	Stipulation Text Summary
IV.F	Protection Measures. If active protection measures are needed such as fencing to protect a newly found site during demolition and/or cleanup activities and NASA's Qualified Personnel determine that certain protection measures can be installed without adverse effects to the NRHP-eligible archeological site(s), then NASA will proceed with installation using Native American and archeological monitors. Such protection activities will be summarized by NASA in writing, and submitted to SHPO, SYBCI, and the NAAB, for their information, prior to installation.
IV.G	Training Module. NASA will develop a training module within six (6) months of the signing of this PA for all demolition and cleanup personnel coming on site to perform cleanup activities that includes the procedures identified in NASA's ICRMP for inadvertent discoveries and human remains.
V.	Consultation. NASA will consult with SHPO, DTSC, SYBCI, and the NAAB as required by the stipulations within this PA.
V.A	Consultation and Review. NASA will submit reports and requests to SHPO and SYBCI for review. Respondents will have thirty (30) calendar days to review submissions, after which NASA will respond, in writing, to written comments within thirty (30) calendar days and provide a (15) day final review opportunity for written comments.
VII.A	Unanticipated Discoveries. In the event management, demolition, or cleanup activities uncover any unanticipated discoveries, NASA will proceed in accordance with the procedures outlined in the NASA SSFL ICRMP. All work within 30 meters of the location will be suspended and the procedures outlined in the ICRMP will be followed.
VII.B	Human Remains. In the event of the discovery of human remains and/or cultural items (funerary objects, sacred objects, objects of cultural patrimony) which are subject to the NAGPRA and ARPA; NASA will implement the procedures outlined in the ICRMP regarding the Treatment of Human Remains and Funerary/Sacred Objects until such time as a Plan of Action is developed in accordance with NAGPRA.
VIII.	Annual Reporting. Each year NASA shall provide all parties to this PA a summary report detailing work carried out pursuant to its terms. Such report shall include any proposed scheduling changes, any problems encountered, and any disputes and objections received in NASA's efforts to carry out the terms of this PA.

3. Planning Level Survey

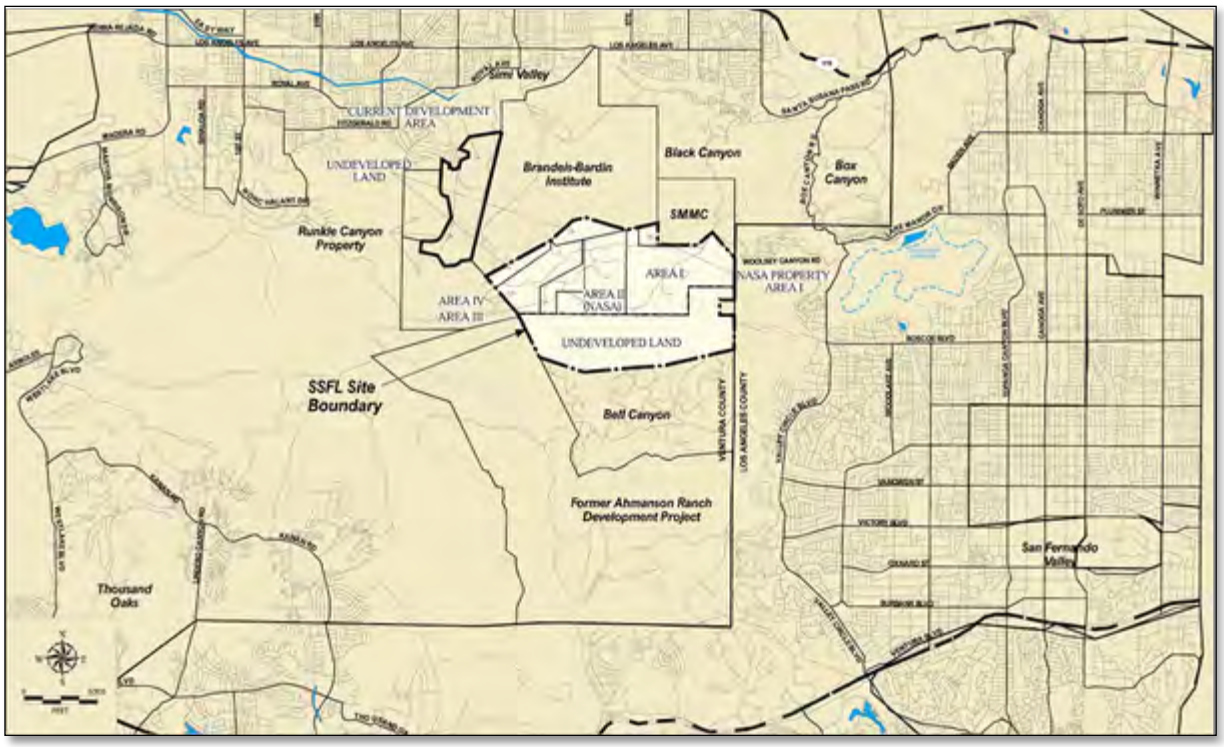
This section provides an overview of SSFL, including a description of the physical environment, a cultural overview, and a brief history of the installation, and concluding with statements regarding NASA's activities at SSFL and its organizational structure.

3.1 Location, Authority, and Physical Environment

SSFL occupies 2,850 acres (1,153 hectares) and is approximately 29 miles northwest of Los Angeles, California, in the Santa Susana Mountain Range. The site sits near the crest of the Simi Hills between the Simi and San Fernando Valleys in southeastern Ventura County, as shown in Figure 1. The property is bounded by Canoga Park in Los Angeles County on the east, Bell Canyon on the south, the Brandeis-Barden Institute on the north, and Meier and Runkle Canyons to the northwest. The site is divided into four areas (Areas I to IV) and an undeveloped area. Areas I, III, IV, and the undeveloped area are owned by Boeing. NASA administers 409 acres (165 hectares) designated as Area II and a 42-acre (17-hectare) portion of Area I. This ICRMP defines the subject area as the NASA-administered areas of the SSFL.

Vegetation includes coastal sage scrub, chaparral, annual grasses, coast live oak, and abundant poison oak. The banks of ephemeral streams also are lined with sycamores. Native animals include mule deer, bobcats, mountain lions, coyotes, gray foxes, reptiles and ring-tailed cats.

Figure 1. Santa Susana Field Laboratory Regional Map.



3.1.1 Topography

The hilly terrain of SSFL, located near the crest of the Simi Hills between the Simi and San Fernando Valleys, has approximately 700 feet (ft) (213 meters [m]) of topographic relief. The Simi Hills are part of the Santa Monica Mountains, which run east-west across southern California and form part of the California Coast Range of the Pacific Mountain System physiographic region. The elevation ranges from 1,650 to 2,175 ft (503 to 663 m) above mean sea level and consists of diverse terrain of ridges, canyons, and sandstone rock outcrops (NASA, 2007).

3.1.2 Geology and Soils

SSFL is part of the Chatsworth Formation, which is composed of poorly to well-cemented massive sandstone bedrock to clay, shale, and crushed sandstone, with interbeds of siltstone and claystone. The mountains consist mainly of late-middle to early Tertiary sedimentary rocks (8 to 70 million years old). It is situated on rocky terrain and occupies an upland area known as Burro Flats, which sits at the crest of the Simi Hills, near their eastern end (U.S. Department of Energy [DOE], 2003). Overlying soils consist of weathered bedrock and alluvium (unconsolidated sand, silt, and clay materials that have been eroded primarily from the surrounding Chatsworth and Martinez Formations). Several geologic faults traverse the site (NASA, 2007).

3.1.3 Vegetation and Land Cover

Ecological resources, including terrestrial, aquatic, and wetland features of SSFL, are described in this subsection. These resource descriptions include lists of species compiled from regional studies conducted by state and federal agencies. The undeveloped areas within SSFL, both in open space and in the natural areas surrounding the developed site areas, consist of a large area of diverse habitats, primarily characterized as chaparral/oak woodland. This diversity is reflected in a wide variety of plants and animals at the site. The habitat and species diversity associated with the SSFL property, the physical attributes of the facility, and its geographic location make the area a potentially important route for effective movement of species. The open space at the site may play an important role as a habitat linkage between the Santa Susana Mountains, the Simi Hills, and possibly the Santa Monica Mountains (NASA, 2007).

Sixteen different vegetation habitat types are found at SSFL including freshwater marsh, open water, unvegetated drainage channels, coast live oak woodland, southern coast live oak riparian forest, southern willow scrub, mulefat scrub, baccharis scrub, Venturan coastal sage scrub, chaparral, native grassland, non-native grassland, ruderal, rock outcrop, eucalyptus woodland, and developed. Rock outcrops occur throughout SSFL and may be found in any of the vegetation types. The banks of the ephemeral streams also are lined with sycamore trees (NASA, 2007). Four sensitive plant species have been documented on SSFL. Braunton's milk vetch (*Astragalus brauntonii*) is a federally endangered plant that is present in the far western portions of SSFL. Santa Susana tarplant (*Deinandra minthornii*) is a California state rare plant that can be found on rocky outcrops throughout the facility. California black walnut and Mariposa lily also have been documented at SSFL (NASA, 2007).

Six plants and five animals were identified by the Santa Ynez Band of Chumash Indians (SYBCI) as having known cultural uses by the tribe. Table 2 lists these species, along with the noted cultural uses.

Table 2. Species with Known Cultural Uses as SSFL

Species Name	Common Name	Cultural Use
Flora Species		
Asclepias eriocarpa	Broad leaved Milkweed, Jumete sp.	Culturally recognized for material culture use and ceremonial use; currently used
Asclepias fascicularis	Narrow leaved Milkweed, Jumete sp.	Culturally recognized for material culture use and ceremonial use; currently used
Amsinckia menziesii	Common Fiddleneck	Culturally recognized as a food source and ceremonial use
Marah macrocarpus	Wild cucumber, Manroot, Chilicote sp.	Culturally recognized for material culture use, medicinal, edible and ceremonial use; currently used
Quercus agrifolia	Coast Live Oak, Encino sp.	Culturally recognized as a staple food source and ceremonial use; currently used
Salvia columbariae	Chia Sage, Chia sp.	Culturally recognized as a food source and ceremonial use; currently used
Faunal Species		
Phrynosoma blainvillii, Anota coronatum	Coast Horned Lizard	Culturally recognized in song and ceremony
Melanderpes formicivorus	Acorn woodpecker	Culturally recognized in oral tradition and ceremonially recognized
Corvus brachyrhynchos	American Crow	Culturally recognized in oral tradition, song, and ceremony
Corvus corax	Common Raven	Culturally recognized in oral tradition and ceremonially recognized
Geococcyzus californianus	Greater Roadrunner	Culturally recognized in oral tradition and ceremonially recognized

Source: Santa Ynez Band of Chumash Mission Indians 2011 (NASA, 2014)

3.1.4 Wildlife and Aquatic Resources

Wildlife surveys performed at SSFL and published in the *Resource Conservation and Recovery Act (RCRA) Facility Investigation Program Report, Surficial Media Operable Unit* (MWH, 2004) provide a basis for wildlife descriptions for SSFL. The wildlife surveys identified 13 mammal species, including bobcat (*Lynx rufus*) and mule deer (*Odocoileus hemionus*). Sixty-nine bird species have been identified at SSFL. The most frequently observed birds are scrub jay (*Aphelocoma californica*), yellow rumped warbler (*Dendroica coronata*), turkey vulture (*Cathartes aura*), red-shouldered hawk (*Buteo lineatus*), northern flicker (*Colaptes auratus*), California quail (*Callipepla californica*), red-winged blackbird (*Agelaius phoeniceus*), and great blue heron (*Ardea herodias*). Raptors found on SSFL include the sharp-shinned hawk (*Accipiter striatus*), Cooper's hawk (*Accipiter cooperii*), red-tailed hawk (*Buteo jamaicensis*), and great-horned owl (*Bubo virginianus*). Ten reptile species and three amphibian species have been observed on SSFL. Western whiptail (*Aspidoscelis tigris*), side-blotched lizard (*Uta stansburiana*), California slender salamander (*Batrachoseps attenuatus*), Pacific tree frog (*Hyla regilla*), and California toad (*Bufo boreas halophilus*) are among the reptiles and amphibians found on SSFL (NASA, 2007). Two fish species have been noted on SSFL including catfish and goldfish (MWH, 2004).

No federally listed wildlife species occur on SSFL. California state wildlife species of concern found on SSFL include San Diego black-tailed jackrabbit (*Lepus californicus melanotis*), loggerhead shrike (*Lanius ludovicianus*), southern California rufous-crowned sparrow (*Aimophila ruficeps canescens*), two-striped garter snakes (*Thamnophis hammondii*), and coast horned lizard (*Phrynosoma coronatum*) (NASA, 2007).

3.2 Cultural Overview

The following chronology is based on Byrd and Raab's updated synthesis of the southern bight cultures, a region that encompasses the California coast from Point Conception in the north to the U.S./Mexican border in the south and that includes SSFL (2007).

The Early Holocene dates between 9600 B.C. and 5600 B.C. and describes the first groups to inhabit California (for which there is significant evidence). These people are described as hunters and gatherers with specialized bifacial projectile points, well-made scrapers, knives, and many other tools designed for subsistence-related tasks (food processing). They adapted to a number of environments and developed a variety of secondary subsistence strategies that enabled them to live in a changing environment (Pleistocene to Holocene). No sites within the SSFL are known to date to this period.

At the start of the Middle Holocene, which dates from approximately 6000 B.C. to A.D. 500, millingstone cultures appeared throughout central and southern California. The Millingstone Horizon represents an adaptive subsistence shift indicated by the first occurrence of millingstones (mano and metate), which were used to process hard seeds like *Salvia* sp. (sages) and *Eriogonum fasciculatum* (wild buckwheat). Sites from this period are characterized by the majority of artifacts being manos and metates, suggesting the importance of vegetal resources. Most of these sites are located in grassland and sagebrush communities where these hard seeds could support small populations on a yearly basis. Late fall and winter were difficult seasons when vegetal foods were scarce and diets had to be supplemented with deer and small mammal hunting and shellfish collecting (Tartaglia, 1976).

Recent analysis of the artifact assemblage recovered from the excavation investigations has provided occupation dates that now state occupation of the Burro Flats site within the SSFL has been ongoing for approximately 7,000 years (King, 2012). Site CA-LAN-357, a village or ranchería, located along lower Bell Creek, may have had a Middle Holocene occupation component, as well (Romani, 1981). Middle Holocene cultures were quite diverse. Large middle Holocene sites have been well documented along the coast, as well as inland. By the Middle Holocene, evidence for extensive trade has been identified in the archeological record in the Southern Bight. Long distance trading is reflected in artifacts recovered from the American Southwest (pottery) in California sites, while steatite objects and Pacific Coast seashells occur in American Southwest sites. Excavations on the southern Channel Islands indicate that a trade network for *Olivella* grooved rectangle beads, manufactured from a rare purple marine shell, was extant by 5,000 years before present. The beads have been identified as far distant as Oregon (Byrd and Raab, 2007).

Temporary settlements for a few nuclear families (10 to 25 individuals) have been recorded that date to the Middle Holocene. These sites were seasonal campsites for exploiting acorns from April through September. The seasonal pattern has been documented as a regional variation in the Millingstone Horizon sites in southern California (King, 1967). These sites are characterized by plant processing tools (scraper planes, millingstones, and an absence of hunting implements). People intensively exploited their

environment, with reliance on no particular food resource. Characteristic features of this period included crude chopping tools, large projectile points, manos and metates, *Olivella* shell beads, quartz crystals and cog stones, few ornaments, earth roasting pits, extended posture burials, reburials (secondary interment), and rock cairns (Wallace, 1955:219-221). The first evidence of cemeteries is recorded during this period, and based on the relative absence of non-utilitarian artifacts, an egalitarian social system was likely to have been in operation (Tartaglia, 1976). Recent evidence indicates that the first permanent villages may have been erected during the Middle Holocene on San Clemente Island (Byrd and Raab, 2007). The presence of daub at Middle Holocene coastal sites indicates that at least some of the villages along the coast may have had permanent structures.

The Late Holocene, which dates from A.D. 500 to historic contact, is characterized by a larger number of more specialized and diversified sites. Population increased substantially and is reflected in a greater number of sites recorded during this time. This period is characterized (Wallace, 1955:223-226) by large village sites, tightly flexed burials, bow and arrow, arrowshaft straighteners, *ollas* (jars) and *comals* (cooking flats), personal ornaments, pottery vessels, circular shell fishhooks, an extensive trade network, a wide variety of ritual objects, and large stone bowls. Elaborate mortuary artifacts are recovered from sites of this period.

SSFL and its vicinity have been associated with the Ventureño Chumash of Simi Valley and Simi Hills and the Fernandeño of the San Fernando Valley through oral histories (Harrington, 1986: Reel 106; Emmick and Bard, 2008; King, 2012; Knight, 2012; NASA, 2009). Chester King proposed new ethnolinguistic boundaries that would revise the ethnicity of Momonga, near SSFL, to Tataviam (NEA and King, 2004). Because territorial borders remain under debate, short summaries of each of these groups are provided in the following subsections. The approximate location of tribal lands are shown in Figure 2.

3.2.1 Fernandeño/Gabrieleño

Prior to the establishment of the mission in southern California, the area in and around Los Angeles primarily was occupied by several villages whose residents spoke a Cupan language that belonged to the Takic sub-family of the Uto-Aztecan language stock. Overall, the language was eventually referred to as Gabrieleño, so named after the Mission San Gabriel. This language actually was represented by several sub-groups, and likely by several dialects between different villages. Kroeber groups the Fernandeño language with the Gabrieleño and San Nicoleño languages (Kroeber, 1925). The Fernandeño are named after the Mission San Fernando del Rey, where area tribes were relocated shortly after European control was established. The Fernandeño referred to the Gabrieleño as *komítáhat,* which translates to the people of San Gabriel (Harrington, 1986: Reel, 106). Thus, Fernandeño appear to be distinct, albeit related to the Gabrieleño. Harrington's informant, Juan Menendez, noted that although there are differences in the Fernandeño and Gabrieleño language, the two languages were quite similar (Harrington, 1986).

Figure 2. Approximate location of Tribal Lands (from Heizer, 1978).

The territory of the Fernandeño included inland valleys and coastal plains. According to Menedez, the Fernandeño held the Tujunga and Mujunga mountains (Harrington, 1986: Reel, 106). Pre-European contact population numbers are difficult to assess due to discrepancies in the record. In 1852, a Scottish-born Los Angeleno, Hugo Reid, who had married a Gabrieleño woman, published a series of letters about the Gabrieleño. Reid believed there were as many as 68 villages. Twenty-eight of these were in Los Angeles County (McCawley, 1996:25) and some of these villages were likely Fernandeño villages. Each village was reported to have contained an average of 100 people and McCawley (1996) offers an estimate of more than 5,000 Gabrieleños at the time of contact. Kroeber offers the estimate of approximately 5,000 Gabrieleños in 1770, including the Fernandeño and the San Nicoleño (1925).

Kroeber, writing in the early 1900s, did not distinguish between customs and lifeways of the Gabrieleño and the Fernandeño (1925). The pre-contact Gabrieleño practiced a patrilinear lineage system. Members of the lineage were given access to diverse resources held by the families within their lineage, allowing the Gabrieleño to exploit multiple ecologies. The heavily hierarchical Gabrieleño social system included elites, commoners, middle-class, poor, and slaves. The elites were the only ones to possess access to religious items and the middle-class supported the elites.

Within Gabrieleño territory, which was composed of coastal areas, islands, valleys, and foothills, there was a patterning to larger settlements; the archeological record provides data regarding large village site distribution and function. Villages were placed where there was access to varying types of environments and resources, and a system of satellite camps stemming from main villages was then established for the specific procurement of resources. The level of use of these satellite campsites was in direct response to population and village size, as well as distance from the main village to the campsite (Earle and O'Neal, 1994).

Subsistence strategies, incorporated seasonal procurement of resources, both terrestrial and marine. Throughout the year, individual families would move to temporary encampments for hunting, harvesting, and collecting; depending on the season and resources that could be harvested, travel would occur through various ecological zones. In the interior, where primary habitation was thought to take place in the summers, deer and rabbit were significant resources amongst the Gabrieleño, who were expert hunters (McCawley, 1996). In spring and summer, temporary camps would be established to gather roots, seeds, and bulbs; in the fall, acorns and other wild seeds were gathered as staples in the diet. In coastal areas that were less exposed to the elements, wintertime villages were occupied; satellite or temporary campsites would be erected near the shore to collect shellfish and other marine resources.

3.2.2 Chumash

The Chumash people occupied the territory between Point Conception and Malibu, including three of the Channel Islands, and ranged from the coasts and islands to the interior and mountains. More specifically, their territory boundaries are north to Atascadero/Paso Robles, south as far as Malibu, and inland from the coast to Bakersfield. Chumash economic activities produced great wealth and possibly allowed for population increase; the largest villages of the pre-contact Chumash reportedly contained a thousand members (Moratto, 1984:119). Several Chumash languages were spoken in the region, and although these languages were related to each other, they were not related to any of the surrounding language groups. Chumash villages near SSFL spoke a dialect commonly referred to as Ventureño.

The Chumash had a strict socioeconomic hierarchy made up of elites and non-elites; only

the chief could have multiple wives (Fages, 1775; McCawley, 1996). It is theorized that there was an interdependent relationship between those who specialized in craft production and the elites, who managed the distribution of goods (Arnold, 2004). Chester King (1971) reported that the Chumash economy was a market economy in which shell beads were the exchange medium. Reciprocal ceremonial exchange also was employed during feasts and celebrations. Open intervillage exchange also was likely (Gamble, 2008). In 1769, Pedro Fages accompanied the Gaspar de Portola expedition, which crossed through California. Fages made some of the first written observations of the Chumash, and although colored by the prejudices of the Spanish at the time, did note the artistry and richness of Chumash wares. Fages (1775) noted the Chumash manufactured wares of great artistry, including stone mortars with inlaid mother-of-pearl, baskets of white, black, and red, and cloaks with shells and small stones. Headgear was often embroidered. Women's skirts were decorated with small shells and stones, as well. Shell bracelets, necklaces, and hair ornaments also were noted by the Spaniards (Fages, 1775).

Coastal Chumash marine resource procurement was heavily dependent on the seaworthiness of fishing vessels; the Chumash were master plank canoe, or *tomol,* builders (Gamble, 2002). Plank canoe building is credited with establishing the sociopolitical power the Chumash held amongst their neighbors, with the exception of the Gabrieleño, a neighboring, largely maritime, culture who seems to have been the sociopolitical equal to the Chumash (Gamble, 2002; McCawley, 1996). The Chumash also constructed a tule reed balsa, a lighter weight watercraft used along the coastline or in calm waters. Explorers and settlers in the area noted the Chumash also used a dugout canoe in the late 1800s, but there is no clear evidence that they employed the dugout before the arrival of the Europeans (Gamble, 2008). Along with marine resource procurement, control of waterways provided the Chumash with a command of transportation and goods distribution to the interior, resulting in the Chumash controlling various trade networks (Gamble, 2002). Plank canoe ownership appears to have been limited to the wealthy Chumash elite. Building a plank canoe was an expensive endeavor, both in time and in materials. The owners of the canoes, in part, controlled trade between the mainland and the islands, likely acting as middlemen between goods manufacturers and tribal chiefs, or *wots* (Gamble, 2008).

Like most hunter-gatherers, the Chumash moved seasonally, primarily in the summer, to optimize their resources. It is reported that they kept permanent winter villages, confining the seasonal camps to temporary occupancy during resource procurement, harvesting, and hunting (Arnold, 2004; King, 1971). These villages consisted of family houses, shaped like half globes with doors on the east and west sides and an opening in the ceiling at the middle of the structure. Four or five related families resided in each house (Fages, 1775). Villages were well populated. Fages estimated at least one village contained about 600 men considered able to bear arms. The village chief appeared to function primarily as a military commander to the Spanish (Fages, 1775).

Large Chumash villages had an *'*antap society, a prestigious organization, of 12 members, which oversaw religious, ceremonial, and other business of the village. Chiefs and their families were required to join this group. Other members of the *'*antap included the *'altip'atishwi*, which was the village herbalist, specifically, the keeper of the poisons; the *'alchuklash*, which was the village shaman, who also practiced astrology and studied astronomy; and the *shan* or *san*, who were assistants. Members of these *'*antap societies used deer tibia whistles during their religious ceremonies (Gamble, 2008:57). Later Chumash society recognized categories of specialists, some of whom did not participate in

food gathering and preparation or in other subsistence activities.

At the time of missionization, baptismal records indicate an average population of 90 members per village, and reports by Fages and Anza estimate a total of 3,000 Chumash at the time of contact. However, a Chumash village survey by Kroeber documented 41 villages on the coast and 25 villages in the interior; the survey results yielded population estimates at more than 10,000 members (Cook, 1976).

By 1810, the land surrounding the Missions had been completely stripped of their indigenous populations, and by 1817, only a handful of Chumash lived outside the Mission system and within their native towns. European diseases exacerbated by poor living conditions within the Missions lead to the precipitous decline in Chumash populations. After secularization of the Missions in 1834, the neophytes were left to fend for themselves, becoming laborers for local ranchos or fleeing into the interior. By 1880, Chumash population may have been as low as 336 individuals (Heizer, 1978).

3.2.3 Tataviam

Tataviam is identified as a Takic branch of Uto-Aztecan stock, closely related to the Serrano (Johnson and Earle, 1990; Solis, 2008). The "People Who Face the Sun" likely migrated into the Santa Clara River area approximately 1,500 years ago and were possibly an offshoot of the Serrano, although there is some debate on this point (Solis, 2008). The extent of Tataviam territory is under debate. Their core area was identified in the early 1900s as stretching from Piru to Soledad Canyon, over much of the upper Santa Clara Valley (Bright, 1975). Johnson and Earle (1990) tentatively identify Tataviam speakers as far north as modern day Quail Lake, near the intersection of Interstate-5 and Highway 138, on the western end of the Antelope Valley. Generally, Tataviam territory included areas from the Santa Clara River to Piru Creek, from the Liebre Mountains to the Santa Susanna Mountains and into the westernmost parts of the Antelope Valley (Higgins, 1996; Johnson and Earle, 1990).

The Tataviam were hunter-gatherers who alternately occupied permanent villages in winter and temporary campsites used for resource gathering of plant foods such as acorns, seeds, berries, yucca, piñon nuts, and hunting deer and rabbit during the spring, summer, and fall months (Solis, 2008). Permanent villages consisted of familial dwellings, a *ki'j*, which was dome shaped and consisted of small saplings or branches affixed to a willow frame and covered with bulrush or cattails. Villages also had a sweat lodge, a *Sehé,* which consisted of a dug out area with a frame similar to the *ki'j*. Sweat lodges also were used as meeting places and dances (Solis, 2008). Johnson and Earle (1990) identified and confirmed several Tataviam villages through genealogical research and review of Harrington and Kroeber's early interviews with local Native Americans, including *Cuecchao, Piru, Tochonanga, Siutasegena*, and *Tochaborunga*.

Of the three groups who occupied what is now SSFL in pre-contact times, the Tataviam are the least known of all Native California groups (Johnson, 2006; Los Angeles County, 2008). The written information that survives references the Tataviam in generalizations and comparisons to their neighbors. Population estimates are at less than 3,000 at time of contact, but there is no feasible way to accurately verify that information. When it comes to population estimates at the time of contact by Europeans, these numbers are approximations and no reliable data exist (Johnson, 2006). Little was recorded about the Tataviam culture during Spanish exploration and later missionization in the 1770s; the Tataviam appeared to have intermarried with other groups and moved to new locations when Europeans settled near the Santa Clara River. Mission records and other historical documents often failed to distinguish the Tataviam as an

individual group when multiple tribes and languages were encountered; often, ethnic affiliation was not distinguished or commented upon. Many of the Tataviam were relocated to the San Fernando Mission during historic times and were assimilated with other groups into an indistinct neophyte culture. Despite missionization and European-introduced diseases, the Tataviam survived into the 20th century. The remnants of the native Tataviam language were documented by John Peabody Harrington in the early 1900s, because the last known native speaker died in 1916 (Native Languages of the Americas, 2009; Regents of the University of California, 2010).

3.3 Historic Context

3.3.1 Spanish/Mission Period (1769 to 1821)

The earliest accounts of Native American communities in the San Fernando Valley and Simi Hills date primarily to the Spanish and Mission Period, which began in 1769 with the founding of the El Presidio Real de San Diego. The Portola expedition passed into the San Fernando Valley in 1769 and the Spanish explorers wrote about a village or villages that exhibited similarities to Channel villages (Romani, 1981).

In the mid-1800s, Hugo Reid recorded what the Gabrieleños told him of the arrival of the first Spanish in Los Angeles County. The Native Americans were at first afraid of the Spaniards on their horses. The women hid and the men put out their fires. They were impressed with the Spaniards' ability to create fire with flint. They also observed one of the Spaniards shoot a bird and kill it and decided that the Spaniards were mortal like them because they killed as the Native Americans did. Any presents received from the Spaniards consisting of durable goods were used, but food was always buried and not consumed. For a time, any white child born among the Native Americans was strangled and buried (Taylor, 2015).

Military outposts were built as expeditions travelled north. During this period, 21 missions were built in California (San Buenaventura Mission, 2006). The Franciscans viewed the local populations as child-like individuals who would benefit from their European instruction and Christianization (We Are California, 2008). Forcibly removed from their villages, the indigenous peoples were brought to the missions. By recording information provided by older Native Americans who remembered life at the San Gabriel Mission, Hugo Reid preserved Native American accounts of the missions. In one notable event, soldiers from San Gabriel went out to Rancho del Chino, several miles inland, and captured an entire village and drove many of the captives back to the mission. When arriving back at the mission, the men were made to surrender their bows and arrows, the children were baptized, and the mothers were kept away from their children until they agreed to baptism. The men were kept away from their families until they also agreed to baptism (Taylor, 2015).

Native Americans were subdued physically. They were taught new trades that benefitted the mission, such as vaqueros, tanners, shoemakers, carpenters, blacksmiths, cooks, servants, fishermen, brick and tile-makers, tallow-melters, and saddle-makers. Industrial-sized soap works and large spinning and weaving rooms were built at the missions (Taylor, 2015). Many perished because of ill treatment and the introduction of European diseases (McCawley, 1996; We Are California, 2008). Mainland Chumash settlements started disappearing once the missions were established. Rapid migration of Chumash island communities appears to have occurred between 1814 and 1816, indicated by a large number of recorded baptisms of island Chumash, largely caused by depopulation, recruitment to the missions, the collapse of the trade routes between the mainland and the islands, and impacts to their resources. This collapse of society occurred even earlier on the mainland.

According to ethnohistoric accounts, rancherias near SSFL included the settlement of Huwam (Chumash), also known as Jucjauybit (Gabrieleño), and El Escorpión (Spanish), which was located in Bell Canyon at the western end of the San Fernando Valley. El Escorpión was also known as Hukxa'oynga (McLendon and Johnson, 1999). The village of Momonga is also near SSFL (Ciolek-Torello et al., 2006). The Santa Barbara Presidio journal recorded in September 1783 that "it was decided to postpone an attack on Conejo and Escorpión Rancherias, who have stolen cattle" (Bancroft, 1884: 566). Several Native American consultants indicated that a village site was likely located near the rock art at Burro Flats (Harrington, 1986; Knapp, 1977).

In 1784, Francisco Reyes applied to Pedro Fages, the Mexican governor, for a grant to El Encino in the San Fernando Valley. Although there is no record of this grant recorded, Reyes stayed in the area, built a house, and grew crops. When missionaries from San Buenaventura arrived in the San Fernando Valley in 1795, looking for a place in the 75 miles between San Buenaventura and San Gabriel to construct a new mission, they reportedly found Reyes. The new mission site was located near Reyes' rancho (Ciolek-Torello et al., 2006).

In notes from the original site reconnaissance for future Mission San Fernando in 1795, Friar Vicente de Santa Maria of Mission San Buenaventura observed many Native Americans at the Rancho San Jose of Francisco Reyes, the site eventually selected for the mission. They took care of the corn, beans, and melons, all belonging to Reyes. They also were the cattlemen, irrigators, bird-catchers, foremen, and horsemen (Engelhardt, 1927). Later that same year, Fr. Vicente de Santa Maria noted the 'pagans' in shoes, with sombreros and blankets, serving as muleteers to the settlers and rancheros (Engelhardt, 1927). As Johnson (1997) points out, by the time the Mission San Fernando had been founded, the Native Americans of the area had already had their lifestyle changed significantly. The traditional hunting and gathering economy was supplemented with crop growing.

The Mission San Fernando was officially founded on September 8, 1797, at the village site of Achoicominga (Engelhardt, 1927). The first 10 children baptized on the day the mission was established were from the Rancho San Jose of Francisco Reyes; subsequent mission registers indicate that these children were originally from other Rancherias and included speakers of several different languages. The Friars' own observations suggest that the people from Achoicominga were likely Chumash and Tataviam and native Valley residents. Three languages were noted as the primary language spoken at the mission: Gabrielino/Tongva, Tataviam, and Ventureño Chumash. A fourth language, Serrano, was noted as well.

Establishment of the missions resulted in the removal of many Native Americans from their traditional areas to the mission lands and the subjugation of the Native Americans. Families were broken up and communities were dissolved. For the first three decades of the Mission Period, the friars concentrated on the Native Americans who lived immediately around the missions, which included the communities that traditionally lived in the Simi Hills (Cook, 1978).

Native American groups located farther from the mission lands were able to retain their traditional lifeways longer than the Native American groups located within the boundaries of the missions. The Missions San Gabriel Arcangel, San Fernando Reyes, and Buenaventura created a sphere of influence that impacted the local cultures. An account from a Russian otter hunter who spent time captive at Mission San Fernando described Native Americans living in terrible conditions. The Russian crew and their fellow Aleuts, who had been captured with them, were made to work in

the fields alongside the Native American neophytes. One night, some of the Native Americans left the mission. Several soldiers arrived at the mission shortly thereafter and hunted down the runaway neophytes. The neophytes who had run away were punished in various ways: some were beaten with sticks and some were beaten with leather straps.

By the late 1700s, economic conditions at the missions were quite poor and the friars decided to supplement their agriculture with traditional Gabrieleño subsistence methods. Revolts and protests among the neophytes were common (Bean and Smith, 1978). By 1810, nearly all of the Tataviam had been removed to the Mission San Fernando and baptized (King and Blackburn, 1978). Disease remained the main cause of declining populations.

In the 1790s, the Spanish government awarded land grants to soldiers and other Spanish Californios (*Ventura Weekly*, 2005); vast tracts of land were used for livestock and farming. In 1795, the Pico family was granted 45,729.6 hectares (ha) (113,000 acres) in the area now known as Simi Valley, and the rancho was named El Rancho Simi (Simi History, n.d.). Like other parts of California, use of large areas of land for herds negatively impacted the local flora and fauna, and thus, the Native Americans who lived in the area. In the early 1800s, much of the Chatsworth area was abandoned, largely as the result of the rapid spread of smallpox among native populations (Knapp, 1977).

3.3.2 Rancho Period (1821 to 1848)

Mexico became independent of Spain in 1821. In 1824, the Mexican government passed the Colonization Act in an effort to raise much needed funds by selling unoccupied lands in California. This law invited immigrants to settle in Mexico (including California) (Texas State Historical Association, 2012). However, much of the land in California belonged to the 21 missions and could not be sold by the new Mexican government. Through the Secularization Act of 1834, the governor secularized the missions of California, and the Mission land was placed under civil jurisdiction to be sold as land grants. This Act relegated the missions to only enough acreage for the church and its associated buildings and for land to support those who lived on mission property. The Secularization Act of 1834 effectively ended the Mission Period in California. Native Americans who had lived at the missions were to receive their share of the land, gardens, and stock of the missions when they were secularized; however, rather than carrying out this edict, the Act was abolished and most Native Americans did not receive anything (Taylor, 2015).

The following years were marked by the proliferation of cattle ranching throughout the region, as the Mexican governor, Pio Pico, granted vast tracts of land to Mexican (and some American) settlers. In Ventura County, there were 19 ranchos, comprising thousands of acres of land each (Galvin Preservation Associates, 2011). The proliferation of Ranchos, and the grazing of horses, sheep, and cows on the traditional aboriginal lands, is largely credited with the destruction of native California flora and of traditional plants and native animal habitat (Douglass and Stanton, 2010). In 1842, Jose de la Guerra y Noriega acquired the Pico family's Rancho Simi (California State Military Museum, n.d.). De la Guerra y Noriega was one of the most prolific landowners and claimed more than 202,343 ha (500,000 acres), with ownership of land extending from the southern end of San Luis Obispo County to the southern end of Ventura County (California State Military Museum, n.d.).

Other ranchos located in the San Fernando Valley that were started in the same decade include El Escorpión, El Encino, Tujunga, Cahuenga, and La Providencia. El Escorpión consisted of approximately 1½ leagues and was located on the far west side of the valley, reaching into the Santa Susana Mountains.

Chijuya Odon, a former mission Native American, probably lived on the El Escorpión rancho from 1836 until his death in the 1880s. His daughter, Espiritu, and her son, Juan Menendez, lived in the Leonis Adobe in Calabasas (McLendon and Johnson, 1999). Rancho El Encino consisted of 4,460 acres and was originally granted to Native Americans, Ramon, Francisco, and Roque, who are noted as selling the rancho to Vicente de la Osa, the grantee of La Providencia, in 1849 (Ciolek-Torello et al., 2006). According to local recollection, Bell Canyon was often the headquarters of Spanish and later Mexican occupation of the western part of the San Fernando Valley. Even during droughts, Bell Canyon had water (Knapp, 1977), making it an ideal location.

3.3.3 American Period (1848 to Present)

Following the signing of the Treaty of Guadalupe Hidalgo in 1848, the U.S. took possession of California. The Land Act of 1851 established a board of Land Commissioners to review these records and adjudicate claims, and charged the Surveyor General with surveying confirmed land grants. To investigate and confirm titles of California, American officials acquired the provincial records of the Spanish and Mexican governments that were located in Monterey. Those records, most of which were transferred to the U.S. Surveyor General's Office in San Francisco, included land deeds and sketch maps (Gutierrez et al., 1998).

From the mid to the late 1800s, the U.S. Government did little to assist struggling Native Americans. The Bureau of Indian Affairs was largely corrupt, and although the government spent time and money moving many U.S. Native Americans to reservations, tribes in California were largely left alone and neglected. More than 10,000 Native Americans were captured and removed from their homes under the California indenture act in 1850 (Castillo, 1978).

Native Americans and gold miners frequently clashed over land. Three Indian agents were sent to California to attempt to negotiate peace between the miners and the native populations. The attempted treaties were not ratified by the U.S. Senate and the violent confrontations between miners and Native Americans continued, and the native populations were further reduced (Heizer, 1978).

From 1852 to 1856, the board of Land Commissioners established the validity of grant claims. The commissioners rejected many of the original rancho claims, which then became public domain and fair game for squatters. Although the claims of some owners eventually were substantiated, many of the original owners lost their land to the U.S. government. The squatters who occupied the land eventually came to own those plots through squatters' rights (Gutierrez et al., 1998).In April 1900, Charles A. Bell acquired a large tract of land near present-day SSFL. Bell was a rancher who hired local Native Americans to work for him. He built a house and stables, improving the land under the Land Patent Act. Into the 1940s, the area on which SSFL is located was still used for ranching (NASA, 2009).

Hollywood studios filmed many movies in the Chatsworth and Santa Susana areas, particularly the "B" Western variety. Burro Flats, within SSFL, was featured, specifically in a number of westerns, as well as television shows such as The Six Million Dollar Man, Bionic Woman, and Star Trek: Deep Space Nine (Bryne, 2012).

3.3.4 Santa Susana Field Laboratory History

Development of the land at what is now SSFL started in the early 1940s by North American Aviation, Inc. (NAA; a predecessor company of Boeing). NAA established the first test stands at the SSFL between 1948 and 1949, immediately following the company's construction of related facilities in 1947 at the Los Angeles International Airport and

Alamogordo Army Air Field (today's Holloman Air Force Base [AFB]) in New Mexico. Personnel from NAA worked at Holloman AFB until late 1949, when its rocket engine testing in New Mexico moved to the Bowl Area at Santa Susana. The test stands of the Bowl Area are often said to be derived from German design, as are NAA's test stands at Holloman AFB.

After a construction hiatus for rocket and missile engine test facilities in the U.S. during the Korean War in the early 1950s, major new test sites augmented programs across the service arms of the U.S. Department of Defense. At SSFL, expansion included the Alfa, Bravo, Coca, and Delta test stand enclaves, with the composite group initially known as the Hot Test Acceptance Facility of NAA's Rocket Engine Field Laboratory (in 1954).

In 1956, the Rocket Engine Field Laboratory transitioned in name to the Propulsion Field Laboratory (PFL). Under the direction, and as of 1958, ownership, of the Air Force, NAA's Rocket Engine Field Laboratory/PFL became Air Force Plant (AFP) 57 in 1957, coupled locally with AFP 56 in Canoga Park (where NAA manufactured rocket engines) and AFP 64 at Santa Susana (a liquid oxygen [LOX] manufacturing plant). Test stands in the Bowl Area complemented those of the Alfa-Delta group, as did NAA's Canyon Area test stands and its Component Test Laboratories (CTLs) to make the Santa Susana site a composite of Government-owned, contractor-operated facilities and corporate enterprise (NAA's contractor-owned, contractor-operated test stands, laboratories, and ancillary facilities at the location) (NASA 2007).

Nearly all rocket engine test and development in Area I (the Bowl and Canyon Areas) and Area II (AFP 57) in the second half of the 1950s derived from the earliest rocket engines tested at Santa Susana, the Navaho and Redstone engines—which NAA, in turn, had created from the V-2 engine. Rocketdyne engineers uprated the Navaho engine from 75,000 pounds thrust to 150,000 pounds thrust for the Thor and Atlas engines, conducting development, test, and evaluation tasks at Santa Susana's AFP 57 for the Air Force during the second half of the 1950s into the early 1960s. Rocketdyne engineers also developed and tested the Jupiter intermediate-range ballistic missile engine for the Army. Test stand allocations for the ballistic missile engine testing at AFP 57 from 1955 to 1961 were as follows:

- Alfa test stands: Atlas on Alfa I (1955–1957), Atlas flight engine and Navaho engine on Alfa II (1956–1957), and firings of Thor (1955–1958), Atlas (1956–1957), Navaho (1956–1957), and Jupiter (1957) engines on Alfa III
- Bravo test stands: Atlas (1956–1957) on Bravo I and II, developmental E-1 engine (1956–1959) on Bravo I, and static firing tests of the RS-2 on Bravo IIIB (1959)
- Coca test stands: Atlas engine on Coca I and II (1956–1957), Atlas engine on Coca II (1959), and a late version of the Navaho engine on Coca III (1956–1957)
- Delta test stands: Atlas on Delta III in 1957, static firings of the Jupiter engine on Delta I (1960–1963), and experimental Air Force rocket engines, including firings of the E-1 engine (1958–1960), the X-1 engine (1958–1961), and the X-4 engine (1960) on Delta II

As of the late 1950s, with the transition of the National Advisory Committee to Aeronautics to NASA, Air Force and Army missiles became the building blocks for propulsion systems to carry man into space. In 1958, a Jupiter C rocket, powered by a Redstone engine, carried the first American satellite, Explorer I, into orbit around the Earth. Late the same year, NASA initiated its Saturn I program. In 1961, NASA adapted a Redstone engine as a component of the propulsion system to launch the inaugural manned Mercury capsule. Beginning in 1961, NASA contracted with Rocketdyne for Large-

Rocket Engine Systems to support its newly established Saturn Apollo program. NASA described its mid-1960s mission at Santa Susana as "the developmental testing of the S-II stage of the Saturn V vehicle, development and testing of the H-1 and J-2 engines, and components testing of the F-1 engine" (NASA, 1965).

In 1964, NASA further summarized its facilities use as including the following:

- Two S-II stage test positions (on Coca I and IV)
- One F-1 components test stand (Bravo I)
- An F-1 components test laboratory (two modules at CTL V)
- An H-1 components test laboratory (two modules at CTL I)
- Three H-1 engine test stands (the Canyon Area)
- A J-2 components test laboratory (three modules at CTL III)
- Five J-2 engine test stands (VTS II and III in the Bowl Area; Delta I, II, and III) (NASA, 1965)

By 1966, MSFC, located in Huntsville, Alabama, had field operations in 20 buildings and structures at SSFL. At midyear, NASA had supervised the construction of four new buildings and structures in the Coca area and had made modifications to the Bravo I and II test stands, the Delta II test stand, and all five CTLs. NASA activities for Saturn (testing for the H-1 engine, and components of the F-1 and J-2 engines) at Santa Susana were most intense during 1964–1968 (see below). In 1968, about 90 percent of the "total contract administration activity…(at AFP 57)…pertain(ed) to support for the National Aeronautics and Space Administration" (NASA, 2007).

Rocketdyne's winning of Phases A and B contracts for tests of a space shuttle engine revitalized SSFL. The company first ran developmental ignition tests for a space shuttle engine at the Nevada Field Laboratory during late 1970 and early 1971. The Nevada Field Laboratory closed in March 1971 after 9 years of operation, but not before the completion of the space shuttle main engine (SSME) tests (Archeological Consultants, Inc. & Weitze Research [ACI and WR], 2009). Rocketdyne subsequently made major facility modifications at SSFL to accommodate SSME testing, particularly at the Coca site (ACI and WR, 2009). Use of the test site areas varied and changed from decade to decade; by the 1980s, NASA had begun to shut down testing activities and only a few active locations continued into the 2000s. The Alfa test area continued to test Atlas MA-5 engines until 2000 and the Delta RS-27 and RS-27 until 2006; the Bravo test area continued to test the Delta RS-27 and Atlas until 2005; the Coca test area continued to test the SSME until 1988; and the Delta test area continued to test engines until 1974, when it was deactivated.

Today, SSFL comprises government-owned, contractor-owned/contractor-operated, corporate enterprise facilities, and facilities operated by DOE on land it leases from Boeing. NASA has discontinued rocket testing, and in 2007 and 2010, orders were issued to conduct environmental cleanup of NASA-administered property in the former LOX Plant Area I and Area II.

3.4 Santa Susana Field Laboratory Current Operations

NASA's ongoing activities in Areas I and II include RCRA cleanup activities, property disposal activities, and cultural resources management.

4. Cultural Resources Inventory

SSFL has forty-four (44) known prehistoric archeological sites, including the Burro Flats Site (CA-VEN-1072). Burro Flats is listed on the NHRP. The remaining 43 archeological sites have not been evaluated for NRHP eligibility and are treated as eligible for listing on the NHRP.

In addition, three historic districts—Alfa Test Stand Area, Bravo Test Stand Area, and Coca Test Stand Area—were documented in 2007 and are eligible for listing on the NRHP.

A stipulation in the 2014 PA required NASA to conduct an Extended Phase I investigation in the footprint of the cleanup and remediation areas. Extended Phase I excavations were carried out for 13 archeological sites that may have been impacted by NASA's cleanup activities and resulted in the enlargement of seven (7) existing site boundaries (NASA, 2016a).

Concurrently, non-intrusive field testing was undertaken by NASA in 2015 in accordance with the Testing Plan (NASA, 2015a) to delineate the outer boundaries of the Burro Flats Site Complex (NASA, 2016b). Although the results of the non-intrusive testing were inconclusive, observations made during the removal of the vegetation in preparation for the testing made it possible not only to delineate the outer boundaries of the Burro Flats Site Complex, but also to refine the boundaries of sites within the complex (NASA, 2016a).

4.1 Significance Criteria

The NRHP is the official list of recognized cultural resources that are important reflections of our heritage. These resources represent the major patterns of our shared local, state (or commonwealth), and national experience (National Park Service [NPS], 1990). Cultural resources listed on, or determined eligible for listing on the NRHP, include historic and prehistoric archeological sites, buildings, structures, objects, districts, and traditional cultural properties. According to 36 CFR Part 60.4 (Criteria for NRHP Evaluation), cultural resources (referred to as properties in the regulations) can be defined as significant (eligible for the NRHP) if they "possess integrity of location, design, setting, materials, workmanship, feeling, and association," and if they satisfy at least one of the following criteria:

A. Are associated with events that have made a significant contribution to the broad pattern of history
B. Are associated with the lives of persons significant in the past
C. Embody distinctive characteristics of a type, period, or method of construction, or represent the work of a master, possess high artistic values, or represent a significant and distinguishable entity whose components may lack individual distinction
D. Have yielded, or may be likely to yield, information important in prehistory or history

The NPS provides technical information and guidelines for evaluating NRHP eligibility in several published bulletins. The initial qualification used for identifying potentially significant cultural resources is the 50-year minimum age necessary for inclusion in the NRHP (36 CFR Part 60.4). The process for evaluating a cultural resource for NRHP eligibility includes categorizing the resource as a district, a site, a building, a structure, an object, or a traditional cultural property (TCP); determining the appropriate context (prehistoric or historic) for the resource; determining whether the resource is significant under the NRHP criteria; and determining whether the

resource retains integrity. After a cultural resource has been assigned to a category, the researcher must identify the historic context represented by the resource. According to the NPS, "the significance of a historic property (cultural resource) can be judged and explained only when it is evaluated within its historic context" (NPS, 1990). Evaluating a cultural resource within its historical context involves several steps. These steps are defined by Savage and Pope (1998:7–8) and include the following:

- Identifying the themes, geographical limits, and chronological period that the resource represents
- Determining how these themes are significant in the history of the area, state, or nation
- Determining whether the particular resource type is important in illustrating these themes through historic associations, architectural or engineering values, or information potential
- Determining the features that the resource must have in order to reflect these themes (Savage and Pope, 1998:7–8) (NASA, 2007)

4.1.1 National Register Exceptions

The following cultural resources are not to be included on the NRHP:

- Archeological sites that do not retain sufficient integrity to contribute significant data
- Buildings and structures not in their original locations
- Properties that have been torn down and rebuilt
- Commemorative properties
- Properties that have only achieved significance within the last 50 years

Cemeteries and grave sites, religious properties, moved properties, birthplaces, reconstructed properties, commemorative properties, and properties achieving significance within the last 50 years must meet specific conditions before being considered eligible under the following criteria for NRHP evaluation:

- Criteria Consideration A: A religious property is eligible if it derives its primary significance from architectural or architectural distinction or historical importance.
- Criteria Consideration B: A property removed from its original or historically significant location may be eligible if it is significant primarily for architectural value or if it is the surviving structure most importantly associated with a historic person or event.
- Criteria Consideration C: A birthplace or grave of a historical figure is eligible if the person is of outstanding importance and if there is no other appropriate site or building directly associated with his or her productive life.

- Criteria Consideration G: The NRHP Criteria for Evaluation exclude properties that achieved significance within the last 50 years unless they are of exceptional importance.

4.2 Architectural Resources

In 2007, ACI and WR conducted an assessment of the built environment within NASA-administered former LOX Plant Area I and Area II of SSFL. This survey assessed 139 federally owned buildings, structures, and sites. ACI identified one structure, a well, in Area I, but there was also a truck scale with a small operators' shed in Area I, which were owned by Boeing (NASA, 2014). The remaining surveyed structures were in Area II. The survey results indicated that 60 of the structures within Area II are temporary; small storage sheds, roadways, pipelines, and objects such as light fixture poles that are generic in use.

The investigation identified three NRHP-eligible historic districts: Alfa Test Stand Area, Bravo Test Stand Area, and Coca Test Stand Area. The archival research and field survey found that six (6) test stands (Buildings 727, 729, 730, 731, 733, and 787) located in the Alfa, Bravo, and Coca Test Area Historic Districts, and three (3) associated control houses (Buildings 208, 213, and 218) (also within the district boundaries), are individually eligible for listing in the NRHP (ACI and WR, 2009). SHPO concurred with these findings in 2008.

The three historic districts (Alfa, Bravo, and Coca Test Stand Areas) meet NRHP eligibility Criterion A for their associations with engine testing and Criterion C for their distinctive design and engineering. In addition, because the buildings have achieved exceptional importance within the past 50 years, Criterion Consideration G applies (NASA, 2008). SHPO concurred with these findings in 2008.

The relevant historic contexts include Cold War defense and missile programs (Military) and Space Exploration from the mid-1950s to 1991 (from Gemini to Space Shuttle).

Table 3 shows the individually eligible properties and the contributing elements of each historic district.

Table 3. NASA SSFL National Register of Historic Places Architectural Resources and NRHP Status

Structure No.	Structure Name	Individually Eligible	Contributing Element
Alpha Test Stand Historic District			
208	Alfa Control House	X	X
209	Alfa Terminal House		X
727	Alfa 1 Test Stand	X	X
727A	Alfa 1 Electrical Control Station		X
2729	Alfa 3 Test Stand	X	X
729A	Alfa 3 Electrical Control Station		X
739	Stand Talker Shack		X
2X	Alfa Observation Structure (Pill Box)		X
2Y	Alfa Observation Structure (Pill Box)		X
N/A	Alfa spillway and landscape		X
Bravo Test Stand Historic District			
213	Bravo Control House	X	X
214	Bravo Terminal House		X
730	Bravo 1 Test Stand	X	X
730A	Bravo 1 Electrical Control Station		X
731	Bravo 2 Test Stand	X	X
731A	Bravo 2 Electrical Control Station		X
2Z	Observation Structure (Pill Box)		X
NA	Bravo spillway and landscape		X

Table 3. NASA SSFL National Register of Historic Places Architectural Resources and NRHP Status

Structure No.	Structure Name	Individually Eligible	Contributing Element
Coca Test Stand Historic District			
218	Coca Control Center	X	X
222	Coca Pre-Test Building		X
235	Coca Electrical Control Station (LOX)		X
236	Coca Electrical Control Station (LH_2)		X
237	Coca GH_2 Compressor Building		X
239	Coca GH_2 Compressor Building		X
241	Coca Pump House		X
520	Coca High Pressure GH_2 and GN_2 Vault		X
614	Coca 4 Observation Structure (Pill Box)		X
733	Coca 1 Test Stand	X	X
787	Coca 4 Test Stand	X	X
2A	Coca North Observation Structure (Pill Box)		X
2B	Coca Observation Structure (Pill Box)		X
V99	Coca GH_2 Vessel		X
V100	Coca LH_2 Vessel 1		X
V108	Coca LOX Vessel 1		X
N/A	Coca Cable Tunnel		X
N/A	Coca Landscape/Spillway		X

4.2.1 Alfa Test Area Historic District

The Alfa Test Area Historic District was recorded as part of the historic resource assessment survey conducted in August 2007 (ACI and WR, 2009). The Alfa Test Area Historic District is eligible for listing in the NRHP under Criterion A for its association with early rocket testing and development and under Criterion C for its engineering and design. The district contains 18 buildings, of which 10 are contributing resources. Constructed during 1954 and 1955, the Alfa test site featured the first cluster of static test stands operational for AFP 57 at SSFL. Beginning in the mid-1950s, the Alfa test site supported early rocket engine static testing and provided pivotal data for the development and improvement of many weapons and space vehicle booster systems (Criterion A). The Alfa Test Area Historic District also is eligible under Criterion C for the design and engineering of the test site. The district includes the test stands and blockhouse, ancillary buildings and structures, and elements of the natural and fabricated landscape.

Within the historic district, 3 of the 10 contributing structures also were determined individually eligible for the NRHP. The Alfa Control House (Building 208), Alfa I Test Stand, and Alfa II Test Stand were documented as individually meeting the NRHP criteria for eligibility in the context of the Cold War (Military) and Space Exploration, under Criterion A for their exceptionally important role in the development and testing of various rocket engines, and under Criterion C for their specialized engineering and design. Because they have achieved exceptional importance within the past 50 years, Criteria Consideration G applies, as well. SHPO concurred on May 15, 2008, with the eligibility of the historic district

and its contributing elements, as well as with the individual eligibility of the three structures.

4.2.2 Bravo Test Area Historic District

The Bravo Test Area Historic District was surveyed as part of the historic resource assessment conducted in August 2007 (ACI and WR, 2009). The Bravo Test Area Historic District contains 10 buildings, 8 of which are contributing resources. Constructed during 1955 and 1956, the Bravo test site featured the second cluster of static test stands operational for AFP 57 at SSFL. Under Criterion A, the district is eligible for listing in the NRHP for its associations with multiple static engine tests run between 1956 and 1991, beginning with tests of Atlas thrust chambers in 1956, and also supporting testing of F-1 components, Lunar Module Rocket Engine assemblies, and Atlas and Delta RS-27 vernier engines and turbopumps. The Bravo Test Area Historic District also is significant under Criterion C for the design and engineering of the test site. The district includes the test stands and blockhouse, ancillary buildings and structures, and elements of the natural and fabricated landscape.

Within the historic district, three of the eight contributing structures were determined individually eligible for the NRHP. The Bravo Control House (Building 213), Bravo I Test Stand, and Bravo II Test Stand were documented as each individually meeting the NRHP criteria for eligibility in the contexts of the Cold War (Military) and Space Exploration, under Criterion A for their exceptionally important role in the development and testing of various rocket engines, and under Criterion C for their specialized engineering and design. Because they have achieved exceptional importance within the past 50 years, Criterion G applies, as well. SHPO concurred on May 15, 2008, with the eligibility of the historic district and its contributing elements, as well as with the individual eligibility of the three structures.

4.2.3 Coca Test Area Historic District

The Coca Test Area Historic District was recorded as part of the historic resource assessment survey conducted in August 2007 (ACI and WR, 2009). The district contains 27 buildings, 18 of which are contributing resources. Constructed in 1955 and 1956, the Coca test site featured the third cluster of static test stands operational for AFP 57 at SSFL. Some of the facilities were modified or redesigned between 1962 and 1964; additional facilities were designed between 1972 and 1978. Under Criterion A, the Coca Test Area Historic District is eligible for listing in the NRHP for its associations with multiple static engine tests run between 1956 and 1988, beginning with tests of Atlas and Navaho engines in the late 1950s; the J-2 engine in the 1960s in support of Saturn and Apollo; and the SSME in the 1970s and 1980s in support of the Space Shuttle Program. The Coca Test Area Historic District is also significant under Criterion C for the design and engineering of the test site.

The district includes the test stands and blockhouse, ancillary buildings and structures, and elements of the natural and fabricated landscape. Within the historic district, 3 of the 18 contributing structures were determined individually eligible for the NRHP. The Coca Control Center (Building 218), Coca I Test Stand, and Coca IV Test Stand were documented as each individually meeting the NRHP criteria for eligibility in the contexts of the Cold War (Military) and Space Exploration, under Criterion A for their exceptionally important role in the development and testing of various rocket engines, and under Criterion C for their specialized engineering and design. Because the district and structures have achieved exceptional importance within the past 50 years, Criterion G applies, as well. SHPO concurred on May 15, 2008, with the eligibility of the historic district and its contributing elements, as well as with the individual eligibility of the three structures.

4.3 Archeological Resources

4.3.1 Burro Flats Site Complex

The original Burro Flats site was listed in the NRHP and the California Register of Historic Resources in May 1976. The NRHP-listed site was first recorded in 1959 and consisted of 10 loci (Rozaire, 1959). At that time, NRHP significance criteria had not been developed. The NRHP website indicates that the site is significant for its informational potential, which today would be Criterion D (NRHP, 2013).

The prehistoric archeological site consists of pictographs or rock art paintings; petroglyphs, which are rock art that has been scored or incised into the rock surface; mortars; tooling; and habitat. Researchers such as Romani and Larson (1985) and McCawley (1996) have described the site as an astronomical observatory and have associated it with the celebration of the winter solstice. This interpretation from an archeoastronomical context is well established and accepted in the archeological community (Gilreath, 2007). The Chumash of the Simi Valley and Simi Hills and the Gabrieleño of the San Fernando Valley, as well as the Tataviam, may have visited the Burro Flats Painted Cave area. The site encompasses approximately 17.3 acres (7 hectares) in the NASA-administered areas of SSFL. The period of significance of the cave is believed to be 1000 to 1499 A.D. However, recent analysis of the artifact assemblage recovered from excavation investigations has resulted in the assertion that occupation of this site has been ongoing for approximately 5,000 years (King, 2012).

The earliest documented investigations at the Burro Flats site began in 1953, with excavations carried out by the Archeological Survey Association of Southern California, which made five trips to the site between 1953 and 1954.

The Burro Flats Site Complex includes several panels of pictographs and petroglyphs in sandstone rock shelters. It also includes many bedrock milling features that would have been used for grinding acorns, and smaller cupules that may have been used for processing food or served an aesthetic function. Much of the site consists of midden, which is debris associated with human habitation. While documenting the middens at the site, Rozaire (1959; 1960) noted that they consisted of debitage, burned bone, and shell fragments. Rozaire also excavated a cremation burial that revealed a mortuary practice used by the Gabrieleño. The site had been documented under numerous separate listings, and some misidentifications of elements and some inconsistencies in function, assemblage, and design interpretations had been recorded.

In 1993, Albert Knight revised the fairly complicated series of site records and trinomials originally established by Rozaire in 1960. Instead of 10 separate site designations, Burro Flats now has the single official trinomial of CA-VEN-1072, with the previous 10 sites understood as loci—prehistoric activity areas and features—within a larger village. Knight's records describe the site as six panels of pictographs found in rock shelters of different sizes and a series of bedrock mortar locations, linked by a large and partly discontiguous archeological deposit, or midden (Whitley, 2007). The site was visited again in 2006 and 2007 by W-S Consultants, Inc. for the express purpose of cataloguing the condition of the rock art (Whitley, 2007). In 2007, NASA revisited the site during pedestrian surveys conducted for the Environmental Impact Statement (EIS) for Areas II and III (NASA, 2014). No new features were identified during the 2007 survey.

In 2014 CA-VEN-1072 was re-recorded by John Minch and Associates as part of an overall pedestrian Phase I survey of NASA's Area I LOX and Area II property. Five (5) new loci were recorded within the boundaries of CA-VEN-1072. After discussions with the South Central Coastal Information Center, it was decided that all of the sites originally subsumed

by CA-VEN-1072 (sites originally recorded by Rozaire in 1959 and Knight in 1991) would remain under the overarching trinomial; new loci within the site boundaries of CA-VEN-1072 would be captured under that trinomial.

4.3.2 Boundary Delineation for the Burro Flats Site Complex

PA stipulation III.A required NASA to confirm the extent of the Burro Flats Site Complex (CA-VEN-1072) and delineate the boundary of the site. The boundary confirmation work was a multi-step process that began in October 2015. After the study area had been cleared of brush, a team of land surveyors set up a grid of 30-foot squares within the Burro Flats area and used a variety of non-intrusive methods to collect geophysical data, including Munsell Soil Color Assay, ground-penetrating radar (GPR), electrical resistivity, and magnetometer technologies (NASA, 2016b). Based on the results of the non-intrusive methods, shovel test probes (STPs) were hand-excavated outside of surface site boundaries to look for the presence or absence of archeological material. Although a few isolated artifacts were found, no archeological features were observed within the STPs.

A boundary for the Burro Flats Site Complex was delineated based upon surface observations made possible by the brush clearance for the non-intrusive work and geophysical features (landscape). As a result, three (3) sites were added to the Burro Flats Site Complex based on surface observations and physiography. A list of sites included in the complex is shown in Table 4.

4.3.3 Archeological Sites Outside the Burro Flats Site Complex

A list of the thirty-two (32) resources located outside the Burro Flats Site Complex is shown in Table 5. These archeological sites can be generally described as either open air lithic scatters or rock shelters with associated sites consisting of either lithic scatters or middens (NASA, 2016b).

In compliance with its 2014 PA, NASA is treating all of its cultural resources as eligible for the NRHP for any undertakings.

4.4 Previous Archeological Research and Recorded Sites

Literature searches were conducted at the South Central Coastal Information Center at California State University−Fullerton for SSFL. Literature searches were conducted first in 2006. An updated literature search was conducted on July 12, 2011, for the NASA-administered portion of SSFL (Area I [former LOX Plant Area] and Area II); a 1-mile undeveloped area around the NASA-administered property at SSFL was included in this research. A subsequent records search was conducted at South Central Coastal Information Center in February 2013 for an additional 9 acres of land on Boeing property just north of the NASA-administered area. Table 4 lists previous studies conducted at SSFL. Multiple cultural resources studies have been conducted within the NASA-administered portion of SSFL.

Table 4. Sites and New Loci within the Burro Flats Site Complex

Field Site No. / Trinomial	Other Previous Locus Designation	Description
VEN-1072	VEN-152 and VEN-161	Rock shelters with a pictograph panels, hearth features, bedrock milling stations and associated midden and lithics
VEN-1072	VEN-159 and VEN-160	Two rock shelters with polychrome pictograph panels, cupules, and associated midden and lithics
VEN-1072	VEN-151 and VEN-157	Rock shelter with pictograph panels, dense midden, and bedrock features
VEN-1072	VEN-153 and VEN-156	Rock shelter with polychrome pictograph panels, cupule features, and associated midden and lithics
VEN-1072	VEN-154 and VEN-155	Cupule boulder/shadow rock with Bear paw bedrock mortars (BRMs) and associated midden
VEN-1072	VEN-158	Rock shelter with pictographs and a small associated lithic scatter
VEN-1072	VEN-1065	Two rock shelters (one above the other) with pictographs, petroglyphs/etchings, and associated midden with shell and lithics
VEN-1072	VEN-1066	Rock shelter with a pictograph panel and associated lithics
VEN-1072	VEN-1067	Possible trail
VEN-1072	VEN-1068	Rock shelter with BRMs and cupules
VEN-1072 locus 5*	5	Lithic scatter with formal artifacts
VEN-1072 locus 6*	6	Rock shelter with lithic scatter
VEN-1072 locus 12*	12	Two rock shelters with midden
VEN-1072 locus 15*	15	Rock shelter with pictographs and lithic scatter
VEN-1072 locus 20*	20	Lithic scatter with a rock shelter and two boulders with cupules
CA-VEN-1823+	23	Rock shelter with lithic scatter
CA-VEN-1824+	23	Rock shelter with pictographs and lithic scatter
VEN-1072 locus 23*	23	Lithic scatter
VEN-1072 locus 24*	24	Lithic scatter
CA-VEN-1825+	25	Lithic scatter
VEN-1072 locus 31*	31	Bedrock mortars

* - new loci incorporated into CA-VEN-1072

+ - new sites included into the Burro Flats site complex

Table 5. Archeological Sites outside the Burro Flats Site Complex

Trinomials	Found In	Site Type
CA-VEN-1468	Area II	Two rockshelters with associated midden
CA-VEN-1800	Area II	Rockshelter with associated lithics
CA-VEN-1809	Area II	Rockshelters with midden.
CA-VEN-1810	Area II	Open air lithic scatter
CA-VEN-1811	Area II	Rockshelter with midden
CA-VEN-1812	Area II	Rockshelter with midden
CA-VEN-1813	Area II	Two rockshelters with a lithic scatter
CA-VEN-1814	Area II	Rockshelter with associated artifacts
CA-VEN-1815	Area II	Rockshelter with associated artifact
CA-VEN-1816	Area II	Rockshelter with associated artifact
CA-VEN-1817	Area II	Rockshelter with associated artifact
CA-VEN-1818	Area II	Rockshelter with associated artifacts
CA-VEN-1819	Area II	Open air lithic scatter
CA-VEN-1820	Area II	Rockshelter with midden
CA-VEN-1821	Area II	Open air lithic scatter
CA-VEN-1822	Area II	Open air lithic scatter
CA-VEN-1826	Area II	Rockshelter with associated artifact
CA-VEN-1827	Area II	Rockshelter with associated artifacts
CA-VEN-1828	Area II	Rockshelter with associated artifact
CA-VEN-1829	Area II	Rockshelter with associated artifact
CA-VEN-1830	Area II	Rockshelter with associated artifact
CA-VEN-1831	LOX	Rockshelter with associated artifacts
CA-VEN-1832	LOX	Open air lithic scatter
CA-VEN-1833	LOX	Rockshelter with midden
CA-VEN-1834	LOX	Open air lithic scatter
CA-VEN-1835	Area II	Rockshelter with associated artifacts
CA-VEN-1836	Area II	Rockshelter with associated artifacts
CA-VEN-1837	LOX	Open air lithic scatter
CA-VEN-1838	Area II	Rockshelter with associated artifacts
CA-VEN-1839/H	LOX	Open air lithic scatter with Modern graffiti
CA-VEN-1840	Area II	Rockshelter with midden
CA-VEN-1841	Area II	Open air lithic scatter

Table 6. Cultural Resources Studies Previously Conducted within NASA-Administered Property of Santa Susana Field Laboratory

Author Name	Date	Report Number
Fenenga (1973)	1973	VN-00211
Romani, Larson, Romani and Benson	1988	VN-01027
Rozaire	1959	VN-01039
Edberg	n.d.	VN-01051
Romani, Romani and Larson	n.d.	VN-01052
Redtfeldt	1979	VN-01058
Atwood	1991	VN-01072
La Monk	n.d.	VN-01089
Knight	1993	VN-01406
Gutman, et al.	1970	VN-01446
King and Parsons	1999	VN-02239
Craft and Mustain	2007	VN-02607
Emmick and Bard	2008	VN-02711
Romani	2009	VN-02797
McClintock, Wilt and Emmick	2009	VN-02719
Knight	1999	VN-02888
ACI and WR	2009	N/A
Holland	2013	VN-03096
CH2M HILL	2012	VN-03056
Holland	2010	VN-02994
Corbett, et al.	2015	N/A
Corbett, et al.	2016	N/A
CH2M HILL	2016	N/A

Notes: CHRIS = California Historical Resources Information System; n.d. = no date made available; N/A = not applicable
Source: CHRIS South Central Coastal Information Center; NASA

4.5 Indian Sacred Site

In December 2012, NASA received notice from SYBCI of the tribe's designation of SSFL as an Indian Sacred Site, including NASA's portion, in accordance with EO 13007. This EO states that, for lands designated as sacred sites, agencies managing federal lands shall:

1. Accommodate access to and ceremonial use of Indian Sacred Sites by Indian religious practitioners and
2. Avoid adversely affecting the physical integrity of such sacred sites. Where appropriate, agencies shall maintain the confidentiality of sacred sites.

NASA is limited by the EO from disclosure of the Sacred Site boundaries. For the purposes of this document, the boundary for the Sacred Site encompasses all of NASA's portion of SSFL. NASA continues consultation with the SYBCI regarding the impacts to the designated Indian Sacred Site.

4.6 Traditional Cultural Property and Cultural Landscape

TCPs can include cultural use areas such as harvesting sites, cemeteries, or religious sites, and their significance is derived from the role the property plays in the community's historically rooted beliefs, customs, and practices; a TCP is synonymous with a place of traditional religious and cultural importance to Native Americans, as referenced in 36 CFR 800.

In 2013 NASA commissioned a TCP and cultural landscape assessment for SSFL and vicinity. The goal of the assessment was to investigate the existence and extent of a potential TCP and to assess the potential for a significant cultural landscape. This was a preliminary investigation, meaning that the majority of the historic context and ethnographic information came from existing documentation. The other element of the assessment was to conduct interviews with local individuals to ascertain the current and previous ethnohistoric uses of the region and the influence of flora and fauna in area development. The preliminary assessment identified a TCP. For the purposes of Section 106, and in consultation with SYBCI, NASA is treating the whole of the NASA-administered area of SSFL as a TCP, but additional research was not conducted at that time to finalize the TCP investigation. Investigations at that time found no 20th century cultural landscapes that would meet NRHP eligibility criteria

According to Stipulation II.C., NASA will prepare an NRHP nomination form for the TCP within 18 months of completion of the ethnographic study.

4.7 Ethnographic History

The 2014 PA stipulates that by April 2017, NASA will complete an ethnographic history (adding to and synthesizing the analyses from the 2013 TCP preliminary assessment and previous related ethnographic studies). The ethnographic history was started at the end of 2015 and interviews with consultants continued through January 2017. The ethnographic study includes a general overview of archeological investigations in the area, interviews, and other research methods based on consultation with federal, state, and local tribes, as well as local experts, to provide a greater understanding of the historic use and associations of the Burro Flats area specifically and SSFL in general. The study will be finalized in 2017. At that time, a public version of the document will be created, excluding any sensitive information, and will be posted on NASA's website, in accordance with the 2014 PA.

5. Management Plan

In April 2014, NASA entered into a PA with the California SHPO and the ACHP to address the adverse effect on historic properties from the demolition and remediation activities on NASA-administered property at SSFL. The PA establishes a process for consultation, review, and compliance during the remediation process. Remediation actions may include the demolition of existing buildings and structures, environmental testing, and the cleanup of soils and groundwater.

5.1 Demolition and Remediation at Santa Susana Field Laboratory

The purpose of the Undertaking (demolition and remediation) is to remediate the environment to a level that meets NASA's environmental cleanup responsibilities and to undertake the demolition actions necessary to support both remediation and property disposition of the NASA-administered portion of SSFL. Contamination is known to exist at the NASA-administered SSFL property because of previous mission activities, and NASA has declared the property excess to its mission needs. The GSA, will be responsible for the disposition of SSFL and compliance with Section 106 of the NHPA for a conveyance outside of federal ownership.

The structures that will be demolished or dismantled as a part of the remediation include some or all test stands, as well as ancillary structures, which have been used since the 1950s for rocket engine testing in the Alfa, Bravo, Coca, and Delta Test Areas. These could include the following:

- Aboveground and subsurface structures
- Building foundations
- Utility poles
- Piping
- Administrative and operations buildings
- Water tanks
- Aboveground and below ground storage tanks
- Observation lookouts, roadways, and drainage ways

Demolition will include the removal of soil under the structures up to 5 ft (1.5 meters) below grade. Demolition of structures in Area II is estimated to take up to 18 to 24 months to complete. Heavy equipment could include excavators, crawler cranes, all-terrain cranes, people-lifts, wheel loaders, 40-ton off-highway trucks, bulldozers, vacuum trucks, motor graders, and skid steer loaders.

Soil remediation will include the excavation, transportation, and disposal of contaminated surface and subsurface soil. In areas where sensitive resources occur, NASA would work with the appropriate regulatory agency to develop an acceptable soil removal process to mitigate impacts to sensitive resources or habitats. Excavation also might be used as a back-up approach to other technologies tried first in an attempt to avoid other environmental impacts, if the other technology did not achieve cleanup to back ground levels. The soil would be excavated to bedrock in some areas where the top of bedrock is shallow. Bedrock would not be excavated. Rock outcrops generally would be retained. The estimated volume of soil requiring excavation under the Proposed Action would be approximately 500,000 cubic yards.

Groundwater remediation may include the drilling of test and/or production wells to varying depths. It is also expected to consist of the operation of a groundwater extraction and treatment system and possible operation of other treatment technologies such as vapor extraction systems or in situ processes. Any of these

systems may be required to operate for a number of years.

5.2 Management Plan

NASA has defined the undertaking's Area of Potential Effects as the entirety of the NASA Property (Area I and Area II), which constitutes 451 acres, plus 39 acres within the Boeing Property that may require cleanup as a part of the undertaking (these 39 acres are not included in this ICRMP, as it is not managed or owned by NASA). Remediation actions may include the demolition of existing buildings and structures, environmental testing and the cleanup of soils and groundwater. Ultimately, the GSA will be responsible for the disposition of government administered portions of SSFL and for compliance with Section 106 of the NHPA for a conveyance outside of federal ownership. In accordance with its 2014 PA, NASA has developed a Worker Environmental Awareness Training (WEAT) module as well as an Environmentally Sensitive Areas Action Plan (ESAAP) to protect cultural resources during remediation, cleanup, and demolition activities at SSFL. These are discussed below.

5.2.1 Training Module

In accordance with the 2014 PA, NASA developed a WEAT module for demolition and cleanup personnel, including new personnel coming on site to perform cleanup and remediation activities (NASA, 2015b). To protect identified and unidentified cultural resources, all personnel who will be working at NASA SSFL will be required to take this training, which will help to identify inadvertent discoveries during ground-disturbing activities. The WEAT is included as Appendix F.

5.2.2 Environmentally Sensitive Areas Action Plan

The ESAAP has been prepared to guide the planning and execution of specific elements of cleanup and remediation with potential for ground disturbance within archeological sites at SSFL. This plan has been prepared in fulfillment of Stipulation III.C of NASA's Section 106 PA as part of compliance with Sections 106 and 110 of the NHPA.

Environmentally sensitive areas (ESAs) will be created around archeological sites and other historic properties where project activities have the potential for ground disturbance within 100 feet. ESA boundaries may be expanded or collapsed based on data from future testing programs, geological features, or inadvertent discoveries. Projects with the potential for ground disturbance within 100 feet of an ESA will be monitored by a qualified archeologist. A Native American monitor will also be invited to participate.

ESAs will be delineated using plastic fencing, construction tape, or surveyors line if necessary. The NASA onsite Project Manager, SSFL onsite Project Manager, and the SSFL Project Archeologist will be responsible for coordinating, planning, and execution of the ESAAP. The ESAAP must be followed by all NASA, contractor, and subcontractor personnel carrying out cleanup and remediation activities. The ESAAP is included as Appendix G.

5.2.3 Native American Graves Protection and Repatriation Act Compliance

In compliance with NAGPRA, the CRM must maintain an accurate and up-to-date inventory of Native American human remains, funerary objects, or sacred objects. It is the responsibility of the MSFC Center Director and the CRM to begin repatriation consultations on materials identified during inventories. If Native American human remains are found during project undertakings, further work in the vicinity will cease for 30 days to allow for consultation with the Tribal Historic Preservation Officers or federally recognized tribes, as required by NAGPRA.

5.2.4 Policies and Responsibilities

Federally owned or controlled installations having statutory and regulatory cultural resource management responsibilities must prepare and implement an ICRMP. Efficient ICRMP implementation at SSFL requires participation by NASA's Historic Preservation Officer and CRM. This section provides descriptions of their responsibilities.

After stating that "every NASA employee is responsible for complying with environmental regulations," NPR 8500.1A (NASA Environmental Management) provides lists of responsibilities for NASA organizational elements. Under NPR 8500.1A, MSFC Center Directors, SSFL Program Office, AS01 are responsible for the following:

- Ensuring that the Center and each component facility under their management cognizance have a designated environmental manager with a direct line of authority from the appropriate Center official.
- Providing sufficient qualified staff and resources required to perform environmental activities.
- Ensuring effective development and execution of environmental training and protocols, to professional development and education initiatives, that will promote the knowledge and proficiency of the NASA workforce in environmental conservation and efficiency management concepts and techniques.
- Establishing and coordinating with all departments and outside workforce, Native American sensitivity training, policies, and procedures for work environments in which Native American cultural material or remains may be present or discovered.
- Implementing Agency environmental functional leadership activities, policies, regulations, and procedural requirements.
- Reviewing and overseeing all environmental activities.
- In collaboration with the NASA Headquarters Office of Institutional and Corporate Management, establishing oversight and evaluating Center operations through functional reviews, performance metrics, or other means to ascertain that appropriate environmental compliance and management techniques are used for the identification, documentation, evaluation, and disposition of all environmental requirements for programs, projects, facilities, systems, and operations.

In addition, according to NPD 8500.1 (Section 5e), the SSFL CRM is responsible for the following:

- Advocating, managing, and allocating assigned environmental program resources, both for Environmental Compliance and Restoration and Center resources.
- Serving as the local source of expertise on environmental policies, procedures, requirements, and processes.
- Supporting functional reviews as necessary to ensure that Center programs, projects, facilities, systems, and operations comply with all environmental requirements.
- Coordinating with all internal organizations to ensure compliance with the law and effective implementation of environmental policies, procedures, and processes.
- Establishing and coordinating with all departments and outside workforces, Native American sensitivity training, policies, and procedures in which Native American cultural material or remains may be present or discovered.

5.3 Compliance with Laws and Regulations

NASA complies with all laws and regulations pertaining to the identification, management, and preservation of cultural resources. All activities, including the issuance of leases and licenses, that conform to these laws and

regulations, among which are NEPA; NHPA; AIRFA; ARPA; NAGPRA; EOs 11593, 13007, and 13287; 36 CFR Part 800; and 36 CFR Part 79. NPR 8580.1 directs NASA to include cultural resources considerations as part of the NEPA documentation process.

The SOPs in this ICRMP were developed to guide the day-to-day activities at NASA SSFL.

6. Standard Operating Procedures

Each of the following SOPs is a set of instructions that outline responsibilities and identify specific actions NASA must take to ensure compliance with one or more federal laws or regulations, as well as the 2014 PA (attached in Appendix D).

NASA will ensure that the following measures are carried out by or under the direct supervision of a person or persons who meet the pertinent qualifications in the Secretary of the Interior's Professional Qualification Standards in those areas in which the qualifications are applicable for the specific work performed.

The seven SOPs for the remediation and demolition undertaking are as follows:

- Standard Operating Procedure 1-1 Treatment of Test Stands and Associated Support Facilities
- Standard Operating Procedure 1-2 Treatment of Known Archeological Sites
- Standard Operating Procedure 1-3 Responding to Inadvertent Discovery of Archeological Deposits
- Standard Operating Procedure 1-4 Treatment of Human Remains and Funerary/Sacred Objects
- Standard Operating Procedure 1-5 Treatment of Other Archeological Properties
- Standard Operating Procedure 1-6 Consultation and Review
- Standard Operating Procedure 1-7 Curation of Archeological Materials

6.1.1 SOP 1-1Treatment of Test Stands and Associated Support Facilities

NASA SSFL contains three NRHP-eligible historic districts: Alfa, Bravo, and Coca Test Area Historic Districts. Each historic district includes two test stands and a control house, which are also individually NRHP-eligible. See Table 3 for a listing of contributing elements to each district.

Applicable Laws/Regulations/Procedural Requirements

- National Historic Preservation Act
- National Environmental Policy Act
- Native American Graves Protection and Repatriation Act
- American Indian Religious Freedom Act
- ARPA
- 2014 Programmatic Agreement

Procedure

1. Demolition Actions:
   a. Immediate Demolition. After completion of the EIS, NASA will demolish non-historic properties, including non-contributing historic structures within the NASA SSFL historic districts, and NASA will demolish the entirety of the Coca Test Stand Historic District.
   b. Items for Display. Prior to demolition of any test stands, NASA will consult with NASA's artifacts officer and the PA Signatories to identify several special or representative pieces of the test stands for display in local museums or through the NASA artifacts module at http://gsaxcess.gov/nasawe1.htm.

2. NASA's archeologist will identify locations where demolition activities may require monitoring by Native American and archeological monitors. NASA will use Native American and archeological monitors, as appropriate, to oversee ground disturbing work in areas of archeological concern.

3. Retention of Historic Test Stands and Facilities
   c. NASA will retain and preserve at least one test stand and control house from Alfa or Bravo Historic Districts and

possibly other contributing elements within the related historic district.

d. NASA will consult with SYBCI, the State of California Department of Toxic Substances Control (DTSC), and SHPO to choose which test stand and control house and contributing elements will remain based on the following criteria:
   i. Meeting the 2010 Administrative Order on Consent (AOC) for Remedial Action conditions; and
   ii. Abatement, operations, and maintenance costs; and
   iii. NASA, SYBCI, or SHPO provides input that identifies concerns related to impacts to the TCP or any newly identified cultural deposits.

4. NASA will conduct a cost estimate for the abatement (including full abatement and/or encapsulation) for the Alfa and Bravo historic districts.

5. NASA will identify one test stand and associated control house at a minimum and other contributing historic properties, if feasible, to preserve/retain. The other historic district will be demolished upon completion of the selection process.

6. If NASA's efforts fail to retain a test stand and control house due to constraints posed by execution of the AOC or reasons outside of NASA's control, NASA will retain several representative pieces of demolished test stands for display in local museums or through the NASA artifacts module at http://gsaxcess.gov/nasawe1.htm.

7. Upon completion of soil cleanup and demolition activities, based on consultation with the SHPO, NASA will provide and maintain a fenced enclosure around any retained test stand(s) until the property is transferred.

6.1.2 SOP 1-2 Treatment of Known Archeological Sites

There are forty-four (44) recorded archeological sites within the NASA-Administered area of SSFL. CA-VEN-1072 (Burro Flats Site Complex) was listed in the NRHP and the California Register of Historic Resources in 1976.

Applicable Laws/Regulations/Procedural Requirements

- National Historic Preservation Act
- National Environmental Policy Act
- Native American Graves Protection and Repatriation Act
- American Indian Religious Freedom Act
- ARPA
- 2014 Programmatic Agreement

Procedure

1. In consultation with the SHPO, SYBCI and Boeing (or its consultants), NASA will develop an updated NRHP nomination form for the Burro Flats Site Complex to be submitted to the SHPO and NRHP.

2. Monitoring: NASA will use archeological and Native American monitors to oversee field sampling, vegetation clearing, and ground-disturbing activities within Burro Flats Site Complex and the ESAAP buffer area defined by NASA, as well as within any other known archeological sites or their ESAAP buffer areas.

3. ESAAP: NASA has developed an ESAAP that will be followed by NASA and its contractors when working within 100 feet of a known cultural resource to prevent inadvertent damage. The ESAAP was developed to delineate areas to be protected, document protective measures required, identify responsible parties and their appropriate tasks, and outline an anticipated schedule and process. The ESAAP has been developed in coordination with the Implementation Plan required by the AOC

to ensure coordination of the cleanup activities. The ESAAP is included as Appendix G.

NASA will ensure that records resulting from excavation of any NRHP-eligible archeological site(s) are curated by an institution meeting the standards set forth in 36 CFR 79, and that artifacts and other material resulting from the same excavation are maintained in accordance with 36 CFR 79 and curated with previous federal collections associated with SSFL within the State of California.

6.1.3 SOP 1-3: Inadvertent Discovery of Archeological Deposits

Regardless of whether an archeological inventory has been completed and regardless of whether a planned undertaking has been assessed for its effect on known historic properties, every undertaking that disturbs the ground surface has the potential to discover buried and previously unknown archeological deposits. This SOP outlines the policies and procedures to be followed in such cases.

Applicable Laws/Regulations/Procedural Requirements

- National Historic Preservation Act
- National Environmental Policy Act
- AHPA
- Archaeological Resource Protection Act
- Native American Graves Protection and Repatriation Act
- NASA Procedural Requirements 8580.1
- 2014 Programmatic Agreement

Policy

Archeological deposits that are newly discovered during any undertaking will be evaluated for their NRHP eligibility. Until NASA has determined in consultation with California SHPO that an archeological site is ineligible for listing in the NRHP, all known sites will be treated as potentially eligible and will be avoided insofar as is possible. In the event that an archeological deposit is inadvertently discovered, work must cease within a 30-m radius; the CRM, the NASA Federal Preservation Officer, the ACHP, and the SHPO must be notified within two working days (for example, letter or email notification); and a professional archeologist (meeting the Secretary of Interior's Professional Qualifications) must be consulted.

If the professional archeologist recommends that the archeological deposit is potentially eligible, the CRM will consult with the California SHPO and federally recognized Native American tribes on the need for further testing and/or data recovery for those sites eligible under Criterion D. If the undertaking may affect properties having historic value to any federally recognized Indian tribes with which NASA consults, the CRM will consult with the tribes and give them an opportunity to participate as interested persons during the consultation process. In the event that human remains are inadvertently discovered, work must cease in the area of the discovery and the CRM must be notified. If remains are determined to be Native American, federally recognized American Indian tribes will be notified.

Procedure

1. Workers will notify the CRM immediately upon the discovery of possible archeological deposits. (Standard language will be placed in contracts requiring contractors to notify the CRM immediately upon discovery of possible archeological deposits.) When notified of the possible discovery of unexpected buried archeological material, the CRM will arrange to have a professional archeologist evaluate the site. Work will cease and the site will be protected pending the results of the evaluation.
    a. If fossils, natural stones, concretions, or other such items that are sometimes mistaken for archeological materials are recovered, then the CRM may allow the excavation to proceed without further action.

b. If possible, that portion of the undertaking will be relocated to avoid the resource. The CRM will have the site recorded and forms submitted to the appropriate California Historical Resources Information System (CHRIS) in a routine manner, having avoided adverse impact through relocation of the proposed undertaking.
c. If the location of that portion of the undertaking cannot be changed, the CRM will contact the California SHPO by telephone or email within 48 hours, report the discovery, and initiate emergency consultation.

2. If the deposits are evaluated as ineligible for the NRHP by a professional archeologist in consultation with SHPO, then NASA will prepare a memorandum for record, to be included in the site record. NASA may allow the excavations to proceed and will advise the excavation foreperson(s) of the possibility and nature of additional discoveries that would require immediate notification of the CRM.

3. If, in the opinion of the professional archeologist, the existing information is deemed insufficient to make a determination of eligibility, then an emergency testing plan will be developed by NASA in coordination with SHPO and SYBCI. Further excavation in the vicinity of the site will be suspended until an agreed testing procedure has been carried out and sufficient data has been gathered to allow a determination of eligibility.
   a. If the California SHPO and CRM agree after testing that the site is ineligible for the NRHP, then work on that portion of the undertaking may resume.
   a. If the site appears to be eligible for the NRHP, or if NASA and SHPO cannot agree on the question of eligibility, then NASA will implement the following alternative actions, depending on the urgency of the action being delayed by the discovery of cultural material.
      1) NASA may relocate that portion of the undertaking to avoid adverse effects.
      2) NASA may request that the site be exempted from cleanup activities if applicable to DTSC as a Native American Artifact in accordance with the AOC.
      3) NASA may seek the opinion of the Keeper of the NRHP.
      4) NASA may request comments from the ACHP and may develop and implement actions that take into account the effects of the undertaking and the comments of SHPO, SYBCI, and the ACHP. Interim comments must be provided to NASA within 48 hours and formal comments within 30 days.
   b. If examination by a professional osteologist indicates the materials are of human origin, an archeologist must make a field evaluation of the primary context of the deposit and its probable age and significance, record the findings in writing, and document the materials.
      1) If at any time human remains, funerary objects, or Native American sacred objects are discovered, the CRM will ensure that the provisions of NAGPRA, ARPA, and/or AIRFA are implemented.
      2) The CRM will begin consultation with federally-recognized tribes.

6.1.4 SOP 1-4 Treatment of Human Remains and Funerary/Sacred Objects

The NAGPRA requires the inventory of human remains and funerary and sacred objects recovered from federal lands that may be subject to claim by Native American tribal groups. The NAGPRA also requires active consultation with such groups to determine the disposition of such remains and objects. No

Native American human remains or sacred/funerary objects are currently known to exist on the SSFL; however, previously undocumented excavations may have encountered human remains and/or sacred/funerary objects and future undertakings may inadvertently encounter these materials.

This SOP outlines the policies and procedures to be followed to ensure future compliance with NAGPRA.

Applicable Laws/Regulations

- Native American Graves Protection and Repatriation Act
- American Indian Religious Freedom Act
- 2014 Programmatic Agreement

Policy

No Native American human remains, funerary objects, or sacred objects from the SSFL will be knowingly kept in Government possession without preparation of an inventory and initiating consultation. Consultation regarding the disposition of Native American human remains, funerary objects, or sacred objects will be initiated as soon as feasible.

Procedure

The CRM will ensure that NASA complies with NAGPRA requirements and the implementing regulations (43 CFR Part 10).

1. The CRM will review all records and collections to determine whether any human remains, funerary objects, or sacred objects originating from the SSFL are known to exist.
    a. If no such objects are found, no consultation is required.
    b. If any such objects are found to be uninventoried, the CRM will prepare an inventory of all such objects and will initiate consultation procedures with the Archaeological Assistance Division NPS (Post Office Box 37127, Washington, D.C. 20013; telephone 202-343-4101; facsimile 202-523-1547) and federally recognized tribes to determine appropriate disposition.
    c. If human remains are discovered during the course of any undertaking, the following procedures will apply:
        A. Work will immediately cease in the vicinity of the human remains.
        B. The site supervisor will immediately notify SSFL MSFC Law Enforcement/ Center Protective Services, the CRM and the NASA Federal Preservation Officer.

2. SSFL Law Enforcement/Center Protective Services officers will notify the County Coroner within 48 hours, the State Health and Safety Code Section 7050.5 states that no further disturbance will occur until the County Coroner has made a determination of origin and disposition pursuant to Public Resources Code Section 5097.98.
    a. If the Coroner determines the human remains to be Native American, the Coroner is responsible for contacting the NAHC within 24 hours after the determination is made. The NAHC, pursuant to Section 5097.98, immediately will notify those persons it believes to be most likely descended from the deceased Native American so they can inspect the burial site and make recommendations for treatment or disposal. After the Coroner has established whether the remains are archeological or modern, NASA will follow the California state requirements. If the remains are prehistoric, NASA will initiate the proper procedures under the ARPA and/or the NAGPRA to decide the disposition of the materials. If the remains are found to be Native American, the steps outlined in NAGPRA, 43 CFR 10.6 (Inadvertent Discoveries) must be followed.
    b. If the remains are not of Native American origin, then the site will be

treated as the discovery of emergency archeology deposits. However, it should be noted that not all human remains, cemeteries, and similar, are NRHP-eligible properties.

c. If the remains are of Native American origin, then further work in the vicinity will be suspended for 30 days to allow for consultation, as required by the NAGPRA. If photographs are taken of the undertaking, only general photographs of the site area are to be taken. Prior to removal of any remains, the CRM will prepare an inventory of the remains and will immediately initiate emergency consultation procedures with the Archaeological Assistance Division, NPS, and tribes.
   A. If consultation allows the remains to be removed, the CRM will cause the remains to be treated and disposed in accordance with the consultation.
   B. Notwithstanding the results of consultation, the CRM will ensure that Section 106 procedures are adhered to with regards to evaluating sites.

6.1.5 SOP 1-5 Treatment of Other Archeological Properties

Regardless of whether an archeological inventory has been completed or whether a planned undertaking has been assessed for its effect on known historic properties, every undertaking that disturbs the ground surface has the potential to discover buried and previously unknown archeological deposits. This SOP outlines the policies and procedures to be followed in such cases.

Applicable Laws/Regulations/Procedural Requirements

- National Historic Preservation Act
- National Environmental Policy Act
- AHPA
- Archaeological Resource Protection Act
- Native American Graves Protection and Repatriation Act
- NASA Procedural Requirements 8580.1
- 2014 Programmatic Agreement

Procedure

1. NASA will provide archeological and Native American monitors for field sampling conducted to identify soil contaminants within NASA SSFL.

2. In the event an archeological site is found meeting NRHP eligibility criteria within the final footprint of other cleanup areas, or NASA determines the site eligible for the NRHP, NASA will consult with DTSC and request that the site be considered part of the "Native American Artifacts" exceptions clauses identified in the AOC and be exempted from the cleanup requirement.

3. If the DTSC decides that the AOC Exception Consideration does not apply and

4. NASA is required to conduct cleanup that will adversely affect the archeological site,

5. NASA will proceed in the same manner as PA Stipulations III D through III G.

6. If active protection measures are needed such as fencing to protect a newly found site during demolition and/or cleanup activities, and NASA's Qualified Personnel determine that protection measures can be installed without adverse effects to the NRHP-eligible archeological site(s), then NASA will proceed with installation using Native American and archeological monitors. If NASA in consultation with SHPO and SYBCI determines the protection measure is likely to cause an adverse effect, NASA will identify ways to avoid, minimize, or mitigate the effects prior to installation.

6.1.6 SOP 1-6 Consultation and Review

NASA will consult with SHPO, DTSC, SYBCI, and the SSFL Sacred Sites Council, and consulting parties as required by the stipulations in the 2014 PA.

Procedure

1. NASA will submit reports and requests to SHPO and SYBCI for review. Respondents will have 30 calendar days to review submissions, after which NASA will respond, in writing, to written comments within 30 calendar days and provide a 15 day final review opportunity for written comments.

2. In the event of disagreement between NASA and DTSC regarding issues related to the PA, the matter will be referred to the dispute process outlined in the 2010 AOC or 2007 Consent Order, as appropriate.

6.1.7 SOP 1-7 Curation of Archeological Materials

NASA is responsible for preservation of archeological collections and associated documents and photographs recovered on the NASA-Administered portion of SSFL. Archeological materials recovered are to be curated at the Autry Museum's Southwest Museum of the American Indian in Los Angeles, California. This SOP outlines guidelines and instructions to be followed by private consulting firms for the preparation of archeological materials and associated documents, maps, and photographs before they are sent to the Southwest Museum of the American Indian for curation. See Appendix C for additional information on curation procedures.

Applicable Laws/Regulations/Procedural Requirements

- National Historic Preservation Act
- Curation of Federally Owned and Administered Archaeological Collections (36 CFR 79)
- 2014 Programmatic Agreement

Procedure

1. All artifacts should be cleaned and stabilized prior to shipment to the repository, except in instances where an unclean condition may facilitate a particular form of analysis (for example, charcoal for C14). In such cases, appropriate documentation of the artifact's condition and the proposed analysis should be included in the artifact inventory and lab methods section of the final report.
   a. Cleaning:
      1) For material collected on the SSFL, use a plain water rinse with a little soft brushing as necessary.
      2) Pottery sherds should be treated with particular care during brushing to prevent any abrasion of the surface by the brush.
      3) Sherds should not be cleaned at all if any soot-like material remains on the exterior or interior surfaces.
      4) Metal artifacts should not be washed but merely dry brushed as needed.
   b. Stabilization: Items requiring specialized conservation measures should be stabilized on a case-by-case basis and further documented in the artifact inventory and lab methods section of the report.
   c. Sorting:
      1) For Phase I Surveys, the collections are to be sorted by site number, project name, provenience, and number of artifacts.
      2) If there are 100 or more artifacts such as in Phase II or Phase III testing, sort artifacts by artifact category (for example, lithic, prehistoric ceramic, historic ceramic, metal, glass, other historic, ethno-botanical, or faunal).
      3) All artifacts are put in 4-mil re-sealable plastic bags.
      4) All bags are to be labeled with permanent ink, with the site number,

project name, provenience, a count of the artifacts, and the field specimen number. Metal artifacts, prehistoric pottery, and any faunal material will be separated into separate individual smaller bags and placed inside the larger artifact bag.

5) Place acid-free tags labeled with the same information in the bags.
6) Place bagged material that has been organized by site and provenience in cardboard artifact boxes.
7) Make a catalog of the content of each box. On a sheet of paper, list the field specimen numbers for each bag.
8) Number each box (see D below) and enclose a box catalog (packing list or inventory control document) in the box.
9) Store all field and lab documentation in acid- free file folders.
10) Label all photographic material with acid-free permanent ink and place in archival quality polypropylene sleeves.
11) Make a master box catalog that will list the project name, all artifacts recovered, their site number and provenience, and the contents of each bag in the box.

d. Boxes:
   1) Site bags will be placed in numeric order in a standard, acid-free storage box (l0-in high, 12.5-in wide and 15-in long).
   2) Box labels must be placed on the "width" end (below handle hole) of each sealed box.
      A. Labels include the site numbers and/or other relevant additional information.
      B. Labels should be typed or hand written in large font and bold letters for easy reading.
      C. Box labels must be self-adhesive or securely attached to boxes with adhesive tape.
      D. The minimum label size for the standard storage box is 3 × 5 in.
      E. Multiple boxes for each site or project collection should be marked on the label with sequential box numbers (Box 1 of 4, Box 2 of 4, etc.). Such numbers must be applied to all boxes, containers, or other packaged artifacts, samples, documents, records, and similar, and cross-referenced to packing lists or similar inventory control documents.

e. Special Packaging
   1) Particularly delicate items, such as ethnobotanical and faunal samples, should be wrapped in aluminum foil and placed in a solid-side container such as a small acid-free box or plastic film canister before packaging with the rest of the site collection.
   2) Oversized artifacts must be securely tagged with appropriate information on acid-free poster board. Mylar or Tyvek tags.
   3) Soil samples should be completely dry before sealing in a 4-mil thick bag and packed separately from the site collection.

f. Shipping
   1) To pack artifacts for shipping, place Styrofoam peanuts at the bottom of the box to act as a buffer and reduce excess volume. Do not use newspaper.
   2) Place materials in position, then fill the remaining volume with Styrofoam peanuts to keep the materials in an upright or stable position within the exterior storage box. The weight of boxed collections

should be distributed as evenly as possible.

3) Standard acid-free storage boxes are suitable for shipping if the contents are appropriately packed.
4) Ship the boxes to the Southwest Museum of the American Indian and pay the Repository in accordance with their current collection management services fees.

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Appendix A. Acronym List

ACHP	Advisory Council on Historic Preservation
ACI	Archeological Consultants, Inc.
AFB	Air Force Base
AFP	Air Force Plant
AHPA	Archaeological Historic Preservation Act
AIRFA	American Indian Religious Freedom Act
AOC	Administrative Order on Consent
APE	area of potential effects
ARPA	Archaeological Resources Protection Act
BRM	bedrock mortar
CA SHPO	California State Historic Preservation Office
CEQ	Council on Environmental Quality
CFR	*Code of Federal Regulations*
CHRIS	California Historical Resources Information System
CRM	Cultural Resources Manager
CTL	Component Test Laboratory
DOE	U.S. Department of EnergyDPR Depart of Parks and Recreation
DTSC	State of California Department of Toxic Substances Control
EIS	environmental impact statement
EO	Executive Order
ESAAP	Environmentally Sensitive Areas Action Plan
ESA	environmentally sensitive area
FPO	Federal Preservation Officer
ft	foot (feet)
GH_2	gaseous hydrogen
GPR	ground-penetrating radar
GSA	General Services Administration
ha	hectare(s)
HAER	Historic American Engineering Record
ICRMP	Integrated Cultural Resources Management Plan
LH_2	liquid hydrogen
LOX	liquid oxygen
m	meter(s)
MSFC	Marshall Space Flight Center
N/A	not applicable
NAA	North American Aviation, Inc.
NAAB	Native American Advisory Board
NAGPRA	Native American Graves Protection and Repatriation Act
NASA	National Aeronautics and Space Administration
NASM	National Air and Space Museum
n.d.	not dated
NEPA	National Environmental Policy Act of 1969, as amended
NHL	National Historic Landmark
NHPA	National Historic Preservation Act of 1966
NPD	NASA Policy Directive
NPR	NASA Procedural Requirements
NPS	National Park Service
NRHP	National Register of Historic Places
PA	Programmatic Agreement
RCRA	Resource Conservation and Recovery Act
SCCIC	South Central Coastal Information Center
SHPO	State Historic Preservation Office
SOP	standard operating procedure

SSC	Sacred Sites Council
SSFL	Santa Susana Field Laboratory
SSME	space shuttle main engine
STP	shovel test probe
SYBCI	Santa Ynez Band of Chumash Indians
TCP	Traditional Cultural Property
U.S.	United States
U.S.C	United States Code
USGS	United State Geological Survey
UTM	Transverse Mercators
WEAT	Worker Environmental Awareness Training
WR	Weitze Research

Appendix B. Glossary

Advisory Council on Historic Preservation (ACHP): The Council was established by Title 11 of the National Historic Preservation Act of 1966 (NHPA) to advise the President and Congress, to encourage private and public interest in historic preservation, and to comment on federal agency action under Section 106 of the NHPA.

American Indian Religious Freedom Act (AIRFA): This act states that the policy of the U.S. is to protect and preserve for American Indians their inherent rights of freedom to believe, express, and exercise the traditional religions of the American Indian, Eskimo, Aleut, and Native Hawaiians. These rights include, but are not limited to, access to sites, use, and possession of sacred objects, and the freedom to worship through ceremony and traditional rites.

Antiquities Act of 1906: This act provides for the protection of historic and prehistoric ruins and objects of antiquity on federal lands and authorizes scientific investigation of antiquities on federal lands, subject to permits and other regulatory requirements.

Archeological Artifact: An object, a component of an object, a fragment or sherd of an object that was made or used by humans, or a soil, botanical, or other sample of archeological interest.

Archeological Records: Notes, drawings, photographs, plans, computer databases, reports, and any other audio-visual records related to the archeological investigation of a site.

Archeological Resource: Any material of human life or activities that is at least 100 years of age and is of archeological interest (32 CFR Section 229.3(a)).

Archaeological Resources Protection Act (ARPA) of 1979: This act prohibits the removal, sale, receipt, and interstate transportation of archeological resources obtained illegally (without permits), from federal or Indian lands and authorizes agency permit procedures for investigations of archeological resources on lands under the agency's control.

Area of Potential Effects (APE): The geographical area within which the undertaking may cause changes in the character of, or use of historic properties, if any such properties exist. The APE may change according to the regulation under which it is being applied.

***Code of Federal Regulations* (CFR):** Includes the Government-wide regulations that all federal agencies must follow, and have the force of law.

Cultural Items: As defined by Native American Graves Protection and Repatriation Act (NAGPRA), human remains and associated funerary objects, unassociated funerary objects (at one time associated with human remains as part of a death rite or ceremony, but no longer in possession or control of the federal agency or museum), sacred objects (ceremonial objects needed by traditional Native American religious leaders for practicing traditional Native American religions), or objects of cultural patrimony (having ongoing historical, traditional, or cultural importance central to a Native American tribe or group, rather than property owned by an individual Native American, and which, therefore, cannot be alienated, appropriated, or conveyed by any individual of the tribe or group).

Cultural Resources: Historic properties as defined by the NHPA, cultural items as defined by NAGPRA, archeological resources as defined by ARPA, sites and sacred objects to which access is afforded under AIRFA, and collections and associated records as defined in 36 CFR 79.

Curation of Federally Owned and Administered Archaeological Collections (36 CFR 79): A ruling issued by the National Park Service (NPS) that establishes definitions, standards, procedures, and guidelines to be followed by federal agencies in the preservation and maintenance of collections of prehistoric and historic material remains and records in their care that are recovered from federal or federally assisted programs.

Executive Order (EO) 11593 of 1971: This directs federal agencies to provide leadership in preserving, restoring, and maintaining the historic and cultural environment of the nation; to ensure the preservation of cultural resources; to locate, inventory, and nominate to the National Register all properties under their control that meet the criteria for nomination; and to ensure that cultural resources are not inadvertently damaged, destroyed, or transferred before the completion of inventories and evaluation for the National Register of Historic Places (NRHP).

Executive Order (EO) 13007 of 1996 on Indian Sacred Sites: This provides additional direction to federal agencies regarding Indian sacred sites. f ederal agencies are, "within the constraints of their missions," required to accommodate Indian tribes' requirements for access to and ceremonial use of sacred sites on public lands and avoid damaging the physical integrity of such sites.

Executive Order (EO) 13287 Preserve America: This establishes a national policy for federal government leadership in preserving America's heritage through active advancement of the protection, enhancement, and contemporary use of the historic properties owned by the Federal Government. This order also promotes intergovernmental cooperation and partnerships for the preservation and use of historic properties. Through specific steps and dead- lines, the Executive Order reemphasizes current requirements for assessment of the status of agency-controlled historic properties (under Section 110 of the NHPA) and management needs and suitability of these historic properties for contributing to community economic development initiatives, including heritage tourism.

Indian Tribe: Any tribe, band, nation, or other organized Indian group or community of Indians, including any Alaska Native village or corporation as defined in or established by the Alaska Native Claims Settlement Act (43 U.S.C. 1601 *et seq.*) that is recognized as eligible for special programs and services provided by the U.S. to Indians because of their status as Indians. Such acknowledged or "federally recognized" Indian tribes exist as unique political entities in a government-to-government relationship with the U.S. The Bureau of Indian Affairs maintains the listing of federally recognized Indian tribes.

Integrated Cultural Resources Management Plan (ICRMP): A 5-year plan developed and implemented by an installation commander to provide for the management of cultural resources in a way that maximizes beneficial effects on such resources and minimizes adverse effects and impacts without impeding the mission of the installation and its tenants. ICRMPs are required in accordance with AR 200-4.

Memorandum for Heads of Executive Departments and Agencies Dated April 29, 1994: Government-to-Government Relations with Native American Tribal Governments: This directs that consultation between the Army and federally recognized Indian tribes shall occur on a government-to-government basis in accordance with this memorandum. Installation commanders shall treat designated representatives of federally recognized Indian tribal governments as the representatives of government. Consultation with federally recognized Indian tribes on a government-to-government basis occurs formally and directly between installation commanders and heads of federally recognized tribal governments. Installation and tribal staff-to-staff communications do not constitute government-to-government consultation.

National Environmental Policy Act of 1969 (NEPA): (P.L. 91-90; 42 U.S.C. 4321-4347). This Act requires federal agencies to prepare an environmental impact statement for every major federal action that affects the quality of the human environment. This includes both natural and cultural resources. It is implemented by regulations issued by the Council on Environmental Quality (40 CFR 1500-08), which are incorporated into AR 200-2, "Environmental Effects of Army Actions." NEPA states that the policy of the Federal Government is to preserve important historic, cultural, and natural aspects of our national heritage and requires consideration of environmental concerns during project planning and execution.

National Historic Landmark (NHL): NHLs are buildings, historic districts, structures, sites, and objects that possess exceptional value in commemorating or illustrating the history of the U.S. They are designated by the Secretary of the Interior after identification by NPS professionals and evaluation by the NPS Advisory Board, a committee of scholars, and other citizens.

National Historic Preservation Act (NHPA) of 1966: (as amended [P.L. 89-665; 16 U.S.C. 470-470w-6]), establishes historic preservation as a national policy and defines it as the protection, rehabilitation, restoration, and reconstruction of districts, sites, buildings, structures, and objects significant in American history, architecture, archeology, or engineering. Section 106 of the NHPA requires that federal agencies take into consideration the effects of their actions on properties listed on or eligible for listing on the NRHP. It is implemented by regulations (36 CFR 800) issued by the ACHP. Section 110 requires federal agencies to locate, inventory, and nominate all properties on their lands that may qualify for the NRHP.

National Park Service (NPS): The bureau of the Department of the Interior to which the Secretary has delegated the authority and responsibility for administering the National Historic Preservation Program.

National Register Criteria: The criteria established by the Secretary of the Interior for use in evaluating the eligibility of properties for the NRHP (36 CFR Part 60).

National Register of Historic Places (NRHP): A nationwide listing of districts, sites, buildings, structures, and objects of national, state, or local significance in American history, architecture, archeology, or culture that is maintained by the Secretary of the Interior. National Register listings must meet the eligibility criteria found in 36 CFR Section 60.4.

Native American Graves Protection and Repatriation Act (NAGPRA) of 1990: (P.L. 101-601), requires federal agencies to establish Native procedures for identifying Native American groups associated with cultural items on federal lands, to inventory human remains and associated funerary objects in federal possession, and to return such items upon request to the affiliated groups. The law also requires that any discoveries of cultural items covered by the Act shall be

reported to the head of the federal entity who shall notify the appropriate Native American tribe or organization and cease activity in the area of the discovery for at least 30 days.

Paleontological Resources: Scientifically significant fossilized remains, specimens, deposits, and other such data from prehistoric, nonhuman life.

Predictive Model: Modeling used to determine areas of high-, medium-, and low-archeological potential.

Programmatic Agreement (PA): A formal agreement between agencies to modify and/or replace the Section 106 process for numerous undertakings in a program.

Sacred Sites Council (SSC): The name of the Native American Advisory Board stipulated to be created as part of the PA. The SSC provides expertise and input on documentation and advises NASA on matters relating to historic properties of interest to the Native Americans on SSFL.

Section 106: Under the NHPA, Section 106 requires that federal agencies take into consideration the effects of their actions on properties listed on or eligible for listing on the NRHP. It is implemented by regulations (36 CFR Part 800) issued by the ACHP.

Section 110: Under the NHPA, Section 110 outlines agencies' responsibilities with respect to historic properties and requires federal agencies to locate, inventory, and nominate all properties that may qualify for the NRHP.

Section 111: Under the NHPA, Section 111 addresses, leases, and exchanges of historic properties. It allows the proceeds of any lease to be retained by the agency for use in defraying the costs of administration, maintenance, repair, and related expenses of historic properties.

Site Locational Models: A model, through past examples, used to predict locations of archeological sites.

State Historic Preservation Officer (SHPO): The person who has been designated in each state, in accordance with the NHPA (101[b][1][A]), to administer the State Historic Preservation Program, including identifying and nominating eligible properties to the NRHP and otherwise administering applications for listing historic properties in the NRHP.

Survey: A scientific sampling of the extent and nature of archeological resources within a specific area.

Undertaking: Any project, activity, or program that can result in changes in the character or use of historic properties as defined by the NHPA. A project, activity, or program under the direct or indirect juris- diction of the installation commander, including those projects, activities, or programs carried out or on behalf of the agency; those carried out with federal financial assistance; those requiring a federal permit, license, or approval; and those subject to state or local regulation administered pursuant to a delegation or approval by a federal agency. Undertakings include new and continuing projects, activities, or programs and any of their elements not previously considered under Section 106 of the NHPA.

Appendix C. Curation of Federally Owned and Administered Archaeological Collections

National Park Service
U.S. Department of the Interior National Center for Cultural Resources NAGPRA

36 CFR Part 79: Curation of Federally Owned and Administered Archaeological Collections

Authorities

Antiquities Act (16 U.S.C. 431- 433), the Reservoir Salvage Act (16 U.S.C. 469-469c), section 110 of the National Historic Preservation Act (16 U.S.C. 470h-2), and the Archaeological Resources Protection Act (16 U.S.C. 470aa-mm).

What does 36 CFR Part 79 cover?

Responsibility for federal collections; procedures and guidelines to manage and preserve collections; terms and conditions for federal agencies to include in contracts, memoranda, agreements, or other written instruments with repositories for curatorial services; standards to determine when a repository has the capability to provide long-term curatorial services; and guidelines for collections access, loan, and use.

What is a "collection?"

A collection is material remains that are excavated or removed during a survey, excavation, or other study of a prehistoric or historic resource, and associated records that are prepared or assembled in connection with the survey, excavation, or other study. Section 79.4 provides detailed definitions of the kinds of material remains that fall under the regulation.

Who is responsible for ensuring that federally owned and administered collections receive proper care?

The federal agency official is responsible for ensuring proper care of federally owned and administered collections. The federal agency official is "any officer, employee, or agent officially representing the secretary of the department or the head of any other agency or instrumentality of the United States having primary management authority over a collection that is subject to this part" (36 CFR Section 79.4(c)).

What constitutes proper care of federally owned and administered collections?

Repositories, whether they are federal, state, local, or tribal, must be able to provide professional, systematic, and accountable curatorial services on a long-term basis. Among their responsibilities, repositories must perform the following:

- Provide a catalog list of the collection contents to the responsible party (i.e., federal agency official, Indian landowner, or tribal official).
- Periodically inspect the physical plant to monitor physical security and environmental conditions.
- Periodically inspect the collection and associated records to monitor their condition.
- Periodically inventory the collection and associated records.
- Provide a written report of the results of inspections and inventories to the responsible party.
- Make the collection available for inspection by the responsible party.

Are there special requirements for archeological collections from Indian lands?

Yes. Because Indian tribes are sovereign nations, archeological collections from Indian lands are treated differently under 36 CFR 79. The Indian land-owner or tribal official retains jurisdiction over the collections,

including the right to determine access, use (including religious use), and disposition. Federal agency and repository officials are encouraged to document their agreements with Indian landowners or tribal official regarding the care and use of archeological collections from Indian lands.

What kinds of uses are encouraged for federally owned or administered collections?

36 CFR Section 79.10 addresses the scientific, educational, and religious use of such collections. Appropriate educational and scientific uses of collections include in-house and traveling exhibits, teaching, public interpretation, scientific analysis, and scholarly research. Section 79.10 also describes the requirements that must be met when loaning a collection and provides guidance for allowing destructive analysis under certain circumstances.

Are there special requirements for the use of religious remains in collections?

Yes. Religious remains are "material remains that the federal agency official has determined are of traditional religious or sacred importance to an Indian tribe or other group because of customary use in religious rituals or spiritual activities. The federal agency official makes this determination in consultation with appropriate Indian tribes or other groups" (36 CFR Section 79.4(i)). Note that the definition of "religious remains" is broader than the Native American Graves Protection and Repatriation Act (NAGPRA) definition of "sacred object." Under Section 79.10, religious remains in a collection must be made available to persons for use in religious rituals or spiritual activities. If the religious remains are from Indian lands, the Indian landowner or tribal official must give consent prior to such use. Under Section 79.11, religious leaders, tribal officials, and official representatives of other groups for which the remains have religious or sacred importance have the right to periodically inspect the religious remains.

May a repository repatriate NAGPRA items that are part of a federally owned or administered collection?

No. The repository official must "redirect any request for transfer or repatriation of a federally owned collection (or any part thereof) to the federal agency official, and redirect any request for transfer or repatriation of a federally administered collection (or any part thereof) to the federal agency official and the owner" (36 CFR Section 79.8(n)). Further, "the Repository Official shall not transfer, repatriate, or discard a federally owned collection (or any part thereof) without the written permission of the federal agency official, and not transfer, repatriate, or discard a federally administered collection (or any part thereof) without the written permission of the federal agency official and the owner" (36 CFR Section 79.8(o)).

Are NAGPRA cultural items excavated or removed from federal or tribal lands after November 16, 1990, considered to be "collections" under 36 CFR 79?

No. However, federal agencies should adhere to the standards of 36 CFR 79 in providing care for such cultural items prior to their disposition.

Where can I learn more about 36 CFR 79?

The complete text of the regulation is available at http://www.nps.gov/nagpra/TRAINING/36-CFR-79_Overview.pdf. Information about managing archeological collections, including the requirements of 36 CFR 79, is available at http://www.nps.gov/archeology/collections/laws_04.htm.

Appendix D. National Aeronautics and Space Administration's 2014 Programmatic Agreement

PROGRAMMATIC AGREEMENT
AMONG
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION,
THE CALIFORNIA STATE HISTORIC PRESERVATION OFFICER,
AND
THE ADVISORY COUNCIL ON HISTORIC PRESERVATION
REGARDING DEMOLITION AND
SOIL AND GROUNDWATER CLEANUP AT
SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA

WHEREAS, This Programmatic Agreement ("PA") is made among the National Aeronautics and Space Administration ("NASA"), the California State Historic Preservation Officer ("SHPO"), and the Advisory Council on Historic Preservation ("ACHP") (referred collectively herein as the "Signatories" or individually as a "Signatory"), pursuant to Section 106 of the National Historic Preservation Act of 1966, as amended ("NHPA"), 16 United States Code ("U.S.C.") § 470f and its implementing regulations, 36 Code of Federal Regulations ("CFR") Part 800.

WHEREAS, NASA notified the SHPO, the ACHP, and the public that it would follow 36 CFR 800.8 and used the process and documentation required for the preparation of an Environmental Impact Statement ("EIS") to comply with Section 106 in lieu of the procedures set forth in 36 CFR 800.3 through 800.6, and the National Environmental Policy Act ("NEPA"); and

WHEREAS, in accordance with the Administrative Order on Consent ("AOC") (See Attachment 1) signed by NASA and the Department of Toxic Substances Control for the State of California on December 6, 2010, and the Consent Order for Corrective Action ("Consent Order") signed by NASA in August 2007 (See Attachment 1), NASA plans to (a) remediate the environment at the NASA-administered portion of the Santa Susana Field Laboratory ("NASA SSFL" or "NASA Property") which includes ongoing environmental testing, soil, and groundwater cleanup, and (b) to demolish the majority of extant structures (hereinafter defined as "Undertaking") necessary to support remediation of the NASA property; and

WHEREAS, NASA is the agency responsible for the Undertaking, including demolition, cleanup actions, and mitigation measures and compliance with Section 106 of the NHPA and the implementing regulations with respect to the Undertaking; and

WHEREAS, the United States General Services Administration ("GSA"), is responsible for the disposition of the NASA SSFL and compliance with Section 106 of the NHPA for a conveyance outside of federal ownership; and

WHEREAS, GSA will conduct its own Section 106 process for the separate disposition undertaking; and

WHEREAS, the NASA SSFL is 451 acres located in Ventura County, California, within the Simi Hills, south of Simi Valley, west of West Hills, and north of Bell Canyon. NASA SSFL is part of a larger complex also known as the Santa Susana Field Laboratory the remainder of which is owned by The Boeing Company ("Boeing" and "Boeing SSFL" or "Boeing Property"), which owns a portion of Area I, and all of Areas III and IV, as well as buffer areas to the north and south of NASA's Property. NASA SSFL comprises all of Area II and a portion of Area I (See Attachments 2

and 3). The Department of Energy ("DOE") leases land in Area IV from Boeing. NASA SSFL includes multiple buildings and facilities that supported the testing of rocket engines from the 1950s until 2006, including laboratory buildings, offices, test stands, control houses, support facilities, and associated roads and utilities; and

WHEREAS, in consultation, NASA defined the Undertaking's Area of Potential Effects ("APE") as the entirety of the NASA Property (Area I and Area II), which constitutes 451 acres, plus 39 acres within the Boeing Property that may require soil cleanup as a part of the Undertaking (Attachment 3, Area of Potential Effects); and

WHEREAS, in consultation with SHPO, on May 15, 2008, NASA determined that the NASA SSFL contains three (3) National Register of Historic Places ("NRHP" or "National Register")-eligible historic districts: Alfa, Bravo, and Coca Test Area Historic Districts. Each historic district includes two test stands and a control house, all of which are also individually NRHP-eligible under Criteria A and C and Criteria Consideration G. These historic properties ("NASA Historic Properties") are from the Cold War (Military) and Space Exploration period of significance, circa mid-1950s to 1991 (Attachment 4); and

WHEREAS, there are three (3) recorded archeological sites within the APE, which was surveyed by NASA and other entities to include "Burro Flats Site" (CA-VEN-1072), a "Rock Shelter" (CA-VEN-1800), and a "Sparse Lithic Scatter" (CA-VEN-1803). The Burro Flats Site (CA-VEN-1072) was listed in the NRHP and the California Register of Historic Resources in 1976. It has since been updated to include 16 separate loci. The Burro Flats Site (CA-VEN-1072) and Sparse Lithic Scatter (CA-VEN-1803) have the potential to be adversely affected by the Undertaking.

WHEREAS, NASA conducted a preliminary Traditional Cultural Property ("TCP") investigation and, in consultation with the Santa Ynez Band of Chumash Indians ("SYBCI"), a federally-recognized Indian tribe, determined that a TCP exists within the APE that likely meets National Register Criterion A in addition to Criterion D for TCPs and has determined that these qualifying characteristics will be adversely affected by NASA's Undertaking; and

WHEREAS, the locations of the archeological sites noted above and the TCP are sensitive information and must remain confidential; and

WHEREAS, the SYBCI has designated the NASA Property part of a larger Indian Sacred Site under Executive Order 13007 and has been invited by NASA to sign this PA as an invited signatory ("Invited Signatory"); and

WHEREAS, the DTSC, having a major role as the regulator responsible for many requirements associated with the AOC and this PA has been invited to sign this PA as an invited signatory ("Invited Signatory") and declined to sign; and

WHEREAS, NASA published an Integrated Cultural Resources Management Plan ("ICRMP") for the NASA Property (See Attachment 1); and

WHEREAS, in consultation with the SHPO, the SYBCI, and the Consulting Parties (hereinafter defined), NASA determined that the Undertaking will have an adverse effect on Historic Properties; and

WHEREAS, in accordance with 36 CFR 800.6(a)(1), NASA has notified the ACHP of its adverse effect determination providing the specified documentation, and the ACHP has chosen to participate in the consultation pursuant to 36 CFR 800.6(a)(1)(iii); and

WHEREAS, NASA also contacted by letter and telephone multiple non-federally recognized tribes within California (See Attachment 5 for a list of Tribes NASA notified), that were identified by the California Native American Heritage Commission ("State-Listed Tribes"), and invited them to participate in consultation on the Undertaking, and some members of these tribes elected to participate as "Consulting Parties", while others State-Listed Tribes did not respond; and

WHEREAS, NASA has consulted with over thirty (30) Section 106 Consulting Parties in accordance with Section 106 of the NHPA, and its implementing regulations (36 CFR 800.6(b)(2)) to resolve the adverse effects of the Undertaking on historic properties (See Attachment 6 for a list of Consulting Parties); and

WHEREAS, NASA also provided for public involvement in accordance with 36 CFR 800.8(a)(1) by coordinating Section 106 review with public review and consultation via an EIS for the Undertaking under provisions of NEPA, 42 U.S.C. §4321 et. seq.; and

WHEREAS, together with the Signatories and the Invited Signatories, NASA consulted with the Consulting Parties, to resolve the adverse effects of the Undertaking on historic properties; and

NOW, THEREFORE, the Signatories agree that the Undertaking shall be implemented in accordance with the following stipulations in order to take into account the effect of the Undertaking on historic properties.

STIPULATIONS

NASA shall ensure that the following measures are carried out by or under the direct supervision of a person or persons who meet(s) or exceed(s) the pertinent qualifications in the Secretary of the Interior's Professional Qualification Standards (http://www.nps.gov/history/local-law/arch_stnds_9.htm) in those areas in which the qualifications are applicable for the specific work performed.

I. TEST STANDS AND ASSOCIATED SUPPORT FACILITIES

A. Demolition Actions

1. Immediate Demolition. Upon completion of the EIS, NASA will demolish all non-historic properties, including all non-contributing historic structures within the NASA SSFL historic districts, and NASA will demolish the entirety of the Coca Test Stand Historic District (See Attachments 3 and 4)

2. Items for Display. Prior to demolition of any test stands, NASA will consult with NASA's artifacts officer and the Signatories and Invited Signatories in accordance with the Consultation and Review Stipulation (Stipulation V) to identify several

special or representative pieces of the test stands for display in local museums or through the NASA artifacts module at http://gsaxcess.gov/nasawel.htm.

3. Monitoring. NASA's archeologist in consultation with SYBCI will identify locations where demolition activities may require monitoring by Native American and archeological monitors. NASA will use Native American and archeological monitors, as appropriate, to oversee ground disturbing work in areas of archeological concern. Their goal will be to minimize impacts to cultural materials, artifacts and intact site deposits and to assure proper protection of any encountered during the Undertaking.

B. Retention of Historic Test Stands and Facilities

1. Retention. NASA will retain and preserve one of the remaining test stands and control house and possibly other contributing elements within the related historic district (Alfa or Bravo).

2. Consultation. NASA will consult with SYBCI, the State of California Department of Toxic Substances Control ("DTSC"), and SHPO to choose which test stand and control house and contributing elements will remain based on the following criteria:

   a. Meeting the 2010 AOC conditions; and

   b. Abatement, operations, and maintenance costs; and

   c. NASA, SYBCI, or SHPO provides input that identifies concerns related to impacts to the TCP or any newly identified cultural deposits,

3. Hazardous Materials Identification. Within one (1) year of the execution of this PA, NASA will conduct a cost estimate for the abatement (including full abatement and/or encapsulation) for the Alfa and Bravo historic districts.

4. Retained Property Identification. NASA will identify one test stand and associated control house at a minimum and other contributing historic properties if feasible to preserve/retain based on information developed for Stipulation I.B.2. NASA will notify the Consulting Parties which facilities will be retained. The other historic district will be demolished upon completion of the selection process.

5. Proviso: If NASA's efforts fail to retain a test stand and control house identified in Stipulation I.B.4 due to constraints posed by execution of the AOC or reasons outside of NASA's control, such as (but not limited to) fiscal or legislative, NASA will retain several representative pieces of demolished test stands for display in local museums or through the NASA artifacts module at http://gsaxcess.gov/nasawel.htm.

6. Fencing. Upon completion of soil cleanup and demolition activities, based on consultation with the SHPO, NASA will provide and maintain a fenced enclosure around any test stand(s) not demolished until the property is transferred.

C. Mitigation Measures for Demolition

1. Structural Documentation. Within six (6) months of the execution of this PA, NASA will engage the National Park Service ("NPS") to complete Historic American Engineering Record ("HAER") Level I documentation of all test stands in Alfa,

Bravo, and Coca Test Area Historic Districts and will complete HAER Level II documentation for control houses within each district, and HAER Level III for all remaining contributing structures to the Alfa, Bravo, and Coca Test Area Historic Districts and submit the documentation to the Library of Congress ("LOC") for archiving.

2. Photography and Narrative. NASA will post on the NASA website within two (2) years of the signing of this PA a collection of historic photos and the historic narrative from existing surveys of NASA SSFL, and will provide the same in an appropriate format that will be available on written request to NASA for five (5) years for interpretive displays at museums, schools, other organizations, or a potential interpretive center. Photos and narrative related to HAER documentation will be included in archival material submitted to the LOC.

3. National Register Determination of Eligibility. NASA will update the National Register Determination of Eligibility for the retained test stand and control house and any other facilities retained in accordance with Stipulations I.B.1 through I.B.4 upon completion of all demolition activities within twelve (12) months of finalization of the decision to retain the structures.

4. Video Documentation. Within twenty-four (24) months of the execution of the PA, NASA will produce a video documenting the history of the construction and use of NASA's SSFL test stands; the video will be posted on NASA's website for three (3) years minimum and available on CD by request for up to three (3) years after posting on the website. The video will include a virtual model or "fly-through" of the test stands.

5. Oral Histories. Within twenty-four (24) months of the execution of the PA, NASA will conduct twelve (12) oral history interviews of personnel who formerly worked at NASA SSFL and will include the transcripts on NASA's oral history website http://www.jsc.nasa.gov/history/nasa_history.htm with links to other NASA websites, including SSFL.

II. TREATMENT OF TRADITIONAL CULTURAL PROPERTY

A. Native American Advisory Board. Within six (6) months of execution of this PA, NASA will establish a Native American Advisory Board ("NAAB") comprising volunteer representatives from federally recognized Indian tribes and State-Listed Tribes with an interest in the protection of Native American sites on NASA SSFL to advise NASA on matters relating to historic properties of interest to Native Americans on NASA SSFL. The NAAB will provide expertise on and input to the development of the ethnographic history described below in Stipulation II.B and in the identification of any ongoing issues related to the management and protection of Native American sites, including the TCP. The NAAB will remain in effect for the duration of this PA, unless the NAAB and NASA agree that the advisory board is no longer needed.

B. Ethnographic History. Within thirty-six (36) months of execution of this PA, NASA will conduct an ethnographic history (adding to and synthesizing the analyses from the TCP Survey and previous related ethnographic studies). The ethnographic history will include

in-depth research of archeological investigations in the area, interviews, and other research methods based on consultation with the NAAB and local experts to provide a greater understanding of the historic use and associations of the Burro Flats area and SSFL. A public version of the ethnographic history will be published on NASA's website for a minimum of five (5) years, with digital copies available upon request. Copies of the ethnographic history will be provided to all Signatories.

C. TCP Nomination. In consultation with SHPO, Boeing, DOE, NAAB, SBYCI, and NPS, NASA will produce and submit a NRHP nomination of the TCP to the California State Historic Resources Commission and the NRHP for the TCP within eighteen (18) months of the completion of the ethnographic history.

D. Access. In accordance with Executive Order 13007, Indian Sacred Sites, NASA will continue to provide access to ceremonial sites for Native Americans. Written requests for access will be processed by NASA until the land is transferred to the next owner. NASA will endeavor to provide such access to Native Americans for ceremonies unless there is safety or health risks associated with the demolition and cleanup activities or concerns regarding the protection or preservation of the site due to weather conditions, fire hazard, or other hazards.

E. Reseeding. NASA will backfill a portion of the removed soil and reseed areas affected by cleanup and demolition activities using a native seed mix similar to the seed mix being used on the adjacent Boeing property to encourage plant regrowth in the TCP.

III. BURRO FLATS SITE (CA-VEN-1072)

A. Boundary Determination and National Register Nomination. Prior to any cleanup excavation activities on the NASA Property, NASA will consult with SHPO to identify a testing plan to conduct further archeological investigations within NASA's boundary to confirm the extent of the boundary ("Burro Flats Site Boundary") on NASA land and, within twelve (12) months of publishing the final report, in consultation with the SYBCI and Boeing (or its consultants), develop an updated National Register nomination form to be submitted to the SHPO and NRHP.

B. Monitoring. NASA will use archeological and Native American monitors to oversee field sampling, vegetation clearing, and ground disturbing activities within Burro Flats Site and the buffer area defined by NASA in 2008 for management purposes, as well as within any other known archeological sites, and will coordinate, where feasible, any sampling within Burro Flats Site Boundary with the boundary determination work.

C. Environmentally Sensitive Areas Action Plan. NASA will develop an Environmentally Sensitive Areas Action Plan ("ESAAP") that will be submitted for review in accordance Stipulation V to SHPO and SYBCI for use by NASA and its contractors for sensitive cultural areas such as archeological sites to provide active protection during the undertaking to prevent inadvertent damage. The ESAAP will be developed by qualified archeologists and will delineate areas to be protected, document protective measures required, identify responsible parties and their appropriate tasks, and outline an anticipated schedule and process. The ESAAP will be developed in coordination with the Implementation Plan required by the AOC to ensure coordination of the cleanup

activities. The ESAAP will provide provisions for conducting the Undertaking within an archeological site, which will be protective of those areas of the site that are not planned to be affected by the Undertaking.

D. AOC Exception Consideration. Prior to commencing the soil cleanup activities in and around Burro Flats, NASA will submit to DTSC the revised Burro Flats Site Boundary that lies within NASA's APE and request that any cleanup required to meet DTSC standards identified in the AOC within the Burro Flats Site Boundary be considered part of the "Native American Artifacts" exceptions clause identified in the Agreement In Principle of the AOC and be exempted from the cleanup requirement.

E. Exemption Override. If DTSC determines that there is an unacceptable health risk that requires environmental cleanup within the Burro Flats Site Boundary, even in view of an exception otherwise available, NASA and DTSC will identify which areas will require cleanup to meet the prescribed health risk identified by DTSC. NASA will determine the most effective cleanup methodology to achieve the goals while being as sensitive as possible to the site, and promptly inform the SYBCI and SHPO of their determination in writing.

F. Data Recovery Consideration. If the cleanup requires excavation within the Burro Flats Site Boundary, NASA will promptly notify the NAAB, SHPO, and SYBCI that it intends to develop a Research Design for a Phase III data recovery plan in accordance with the Consultation and Review Stipulation (Stipulation V).

1. NASA will consult with the NAAB, SHPO, and SYBCI to develop a Research Design for a Phase III data recovery plan, which will include a provision for Native American monitors. The submission package will be submitted by NASA to SYBCI and SHPO in accordance with the Consultation and Review Stipulation (Stipulation V). NASA will proceed with the Phase III data recovery plan prior to proceeding with cleanup within the archeological site boundaries.

2. If the SHPO and/or SYBCI requests, in writing within 30 days of notification, that NASA refrain from conducting data recovery, as described in III.F, within or around the Burro Flats Site Boundary, NASA will work with SYBCI and SHPO to identify an alternative mitigation. Alternative mitigation will be agreed to in a request for concurrence letter sent from NASA and concurred by SYBCI and SHPO prior to commencement of cleanup activities within the Burro Flats Site Boundary.

G. Documentation and Curation. NASA shall ensure that all records resulting from excavation of any National Register-eligible archeological site(s) are curated by an institution meeting the standards set forth in 36 CFR 79, and that all artifacts and other material resulting from the same excavation are maintained in accordance with 36 CFR 79 and curated with previous federal collections associated with SSFL within the State of California.

H. Protection. NASA will update its Standard Operating Procedures ("SOP") for Archeological Resource Protection Act Compliance Review and Preventing Vandalism to Archeological Sites within NASA's ICRMP to include protection during demolition and

cleanup activities, and the update will be submitted by NASA to SYBCI and SHPO in accordance with the Consultation and Review Stipulation (Stipulation V).

IV TREATMENT OF OTHER ARCHEOLOGICAL PROPERTIES

In order for NASA to conduct environmental remediation and demolition activities, NASA will ensure the following stipulations are implemented:

A. Field Sampling. NASA will provide archeological and Native American monitors for field sampling conducted to identify soil contaminants within NASA SSFL.

B. Further Archeological Investigation. Within six (6) months of the completion of the final environmental field sampling or testing, NASA will commence Extended Phase I archeological investigations in those footprints of cleanup areas where NASA plans to excavate soil to achieve cleanup goals. Where necessary, to allow archeological investigation beneath building footprints, some archeological investigations may be delayed. These investigations will include Native American monitors. All archeological investigations will be completed prior to conducting ground disturbing activities (other than minor disturbance in and around structures being demolished.)

C. Archeological Site Discovery and Evaluation. Any newly identified archeological sites within the Extended Phase I investigations will be evaluated by NASA in accordance with 36 CFR 63 and bulletins, guidance, and documents produced by the NPS, in consultation with NAAB, SHPO, and SYBCI, to determine if they are historic properties. NASA will submit the report for review in accordance with the Consultation and Review Stipulation (Stipulation V).

D. In the event the final cleanup footprint includes a portion of the Sparse Lithic Scatter (CA-VEN-1803) or an archeological site is found meeting the National Register eligibility criteria within the final footprint of other cleanup areas, or NASA determines the site eligible for the NRHP for the purposes of this Undertaking, NASA will consult with DTSC and request that the site be considered part of the "Native American Artifacts" exceptions clauses identified in the AIP of the AOC and be exempted from the cleanup requirement.

   1. If the DTSC decides that the AOC Exception Consideration does not apply and NASA is required to conduct cleanup that will adversely affect the archeological site, NASA will proceed in the same manner as Stipulations III.D through III.G.

E. ICRMP Updates. NASA will update its ICRMP to include the National Register-eligible site(s), should they exist, and to include in the ICRMP protection measures during demolition and cleanup per Stipulation III.H. The updated ICRMP will be submitted by NASA to SYBCI and SHPO in accordance with the Consultation and Review Stipulation (Stipulation V).

F. Protection Measures. If active protection measures are needed such as fencing to protect a newly found site during demolition and/or cleanup activities, and NASA's Qualified Personnel determine that certain protection measures can be installed without adverse effects to the National Register-eligible archeological site(s), then NASA will proceed with installation using Native American and archeological monitors. Such protection

activities will be summarized by NASA in writing, and submitted to SHPO, SYBCI, and the NAAB, for their information, prior to installation.

1. If NASA determines the protection measure is likely to cause an adverse effect, NASA will consult with SHPO, SYBCI, and the NAAB to identify ways to avoid, minimize, or mitigate the effects prior to installation.

G. Training Module. NASA will develop a training module within six (6) months of the signing of this PA for all demolition and cleanup personnel, including new personnel coming on site to preform cleanup activities throughout the life of the project, who will be working at NASA SSFL for the protection of cultural resources that includes the procedures identified in NASA's ICRMP for inadvertent discoveries and human remains.

V. CONSULTATION AND REVIEW

A. NASA will consult with SHPO, DTSC, SYBCI, and the NAAB as required by the stipulations within this PA.

1. NASA will submit reports and requests to SHPO and SYBCI for review. Respondents will have thirty (30) calendar days to review submissions, after which NASA will respond, in writing, to written comments within thirty (30) calendar days and provide a (15) day final review opportunity for written comments.

2. In the event of disagreement by SHPO, SYBCI, or NAAB with NASA or each other regarding the stipulations contained within the PA, the matter will be addressed in accordance with the Dispute Resolution Stipulation (Stipulation IX).

3. In the event of disagreement between NASA and DTSC regarding issues related to this PA, the matter will be referred to the dispute process outline in the 2010 AOC or 2007 Consent Order, as appropriate and NASA will inform SHPO, SYBCI, or NAAB of the outcome as reasonably practical.

VI. DURATION

This PA will expire in six (6) years from the date of its execution or when stipulations are complete. Prior to such time, NASA may consult with the other Signatories and Invited Signatories to reconsider the terms of the PA and amend it in accordance with the Amendments Stipulation (Stipulation XI).

VII. UNANTICIPATED DISCOVERIES

A. In the event management, demolition, or cleanup activities uncover any unanticipated discoveries, NASA will proceed in accordance with the procedures outlined in Attachment 7. All work within 30 meters of the location will be suspended and the procedures outlined in Attachments 7 and 8 will be followed.

B. In the event of the discovery of human remains and/or cultural items (funerary objects, sacred objects, objects of cultural patrimony) which are subject to the Native American Graves Protection and Repatriation Act ("NAGPRA") (25 U.S.C. § 3001-3013, 18 U.S.C. § 1170) and the Archeological Resources Protection Act ("ARPA") (16 U.S.C. § 470aa-470mm); NASA will implement Attachment 8 regarding the Treatment of Human

Remains and Funerary/Sacred Objects until such time as a Plan of Action is developed in accordance with NAGPRA. The plan shall include provisions for in-place preservation, excavation, and analysis, in accordance with a data recovery plan (identified in Stipulation III.G-H), and disposition of the remains, as appropriate. In development of the Plan NASA will, in good faith, consult with the relevant parties such as the NAAB and SYBCI in accordance with applicable law. The Plan of Action will supersede Attachment 8 upon completion. If the remains are determined to be non-native, NASA shall follow the procedures outlined in the applicable California unmarked burial law.

VIII. ANNUAL REPORTING

Each year, following the execution of this PA until it expires or is terminated, upon completion of the cleanup, NASA shall provide all parties to this PA a summary report detailing work carried out pursuant to its terms. Such report shall include any proposed scheduling changes, any problems encountered, and any disputes and objections received in NASA's efforts to carry out the terms of this PA.

IX. DISPUTE RESOLUTION

Should any Signatory or Invited Signatory to this PA object at any time to any actions proposed or the manner in which the terms of this PA are implemented, NASA shall consult with such party to resolve the objection. If NASA determines that such objection cannot be resolved, NASA will:

A. Forward all documentation relevant to the dispute, including NASA's proposed resolution, to the ACHP. The ACHP shall provide NASA with its comments on the resolution of the objection within thirty (30) days of receiving adequate documentation. Prior to reaching a final decision on the dispute, NASA shall prepare a written response that takes into account any comments regarding the dispute from the ACHP, Signatories and Invited Signatories, and provide them with a copy of this written response. NASA will then proceed according to its final decision.

B. If the ACHP does not provide comments regarding the dispute within the thirty (30)-day period, NASA may make a final decision on the dispute and proceed accordingly. Prior to reaching such a final decision, NASA shall prepare a written response that takes into account any timely comments regarding the dispute from the Signatories and Invited Signatories, to the PA, and provide them and the ACHP with a copy of such written response.

C. NASA's responsibilities to carry out all other actions subject to the terms of this PA that are not the subject of the dispute remain unchanged.

X. ANTI-DEFICIENCY

NASA's obligations under this PA are subject to the availability of appropriated funds, and the stipulations of this PA are subject to the provisions of the Anti-Deficiency Act. NASA will make reasonable and good faith efforts to secure the necessary funds to implement this PA in its entirety. If compliance with the Anti-Deficiency Act alters or impairs NASA's ability to implement the stipulations of this PA, NASA will consult in accordance with the Amendments Stipulation (Stipulation XI) or Termination Stipulation (Stipulation XII) of this PA.

XI. AMENDMENTS

This PA may be amended when such an amendment is agreed to in writing by all Signatories of the PA. The amendment will be effective on the date a copy signed by all of the Signatories and Invited Signatories is filed with the ACHP.

XII. TERMINATION

A. If any Signatory or an Invited Signatory that signed this PA determines that the terms of the PA will not or cannot be carried out, that party shall immediately consult with the other parties to attempt to develop an amendment per Stipulation XI, above. If within thirty (30) days (or another time period agreed to by all Signatories and Invited Signatories that signs the PA) an amendment cannot be reached, any Signatory and/or an Invited Signatory that signed this PA may terminate the PA upon written notification to the other Signatories and Invited Signatories.

B. In the event of termination of this PA, NASA shall comply with the provisions of 36 CFR Part 800 for all portions of the Undertaking that have not already begun. For any new undertakings or changes in the Undertaking, NASA must either (a) execute a PA pursuant to 36 CFR 800.6, or (b) request, take into account, and respond to the comments of the ACHP under 36 CFR 800.7. NASA shall notify the Signatories and Invited Signatories that signed the PA, to the course of action it will pursue.

XII. CONFIDENTIALITY

All parties to this PA acknowledge that information about historic properties, prospective historic properties, or properties considered historic for purposes of this PA are or may be subject to the provisions of Section 304 of NHPA and Section 6254.10 of the California Government Code (Public Records Act), relating to the disclosure of sensitive information, and having so acknowledged, will ensure that all actions and documentation prescribed by this PA are, where necessary, consistent with the requirements of Section 304 of the NHPA and Section 6254.10 of the California Government Code.

EXECUTION of this PA by NASA, ACHP, and SHPO and implementation of its terms evidence that NASA has taken into account the effects of this Undertaking on historic properties and afforded the ACHP an opportunity to comment.

SIGNATORIES:

NASA:

Patrick E. Scheuermann
Director

Date: 4/2/14

California State Historic Preservation Officer:

Carol Rowland-Nawi

Date: 4-10-14

Advisory Council on Historic Preservation:

Date: 9/17/14

John Fowler
Director

INVITED SIGNATORY:

Santa Ynez Band of Chumash Indians

Vincent Armenta, Chairman

Date: 4/23/14

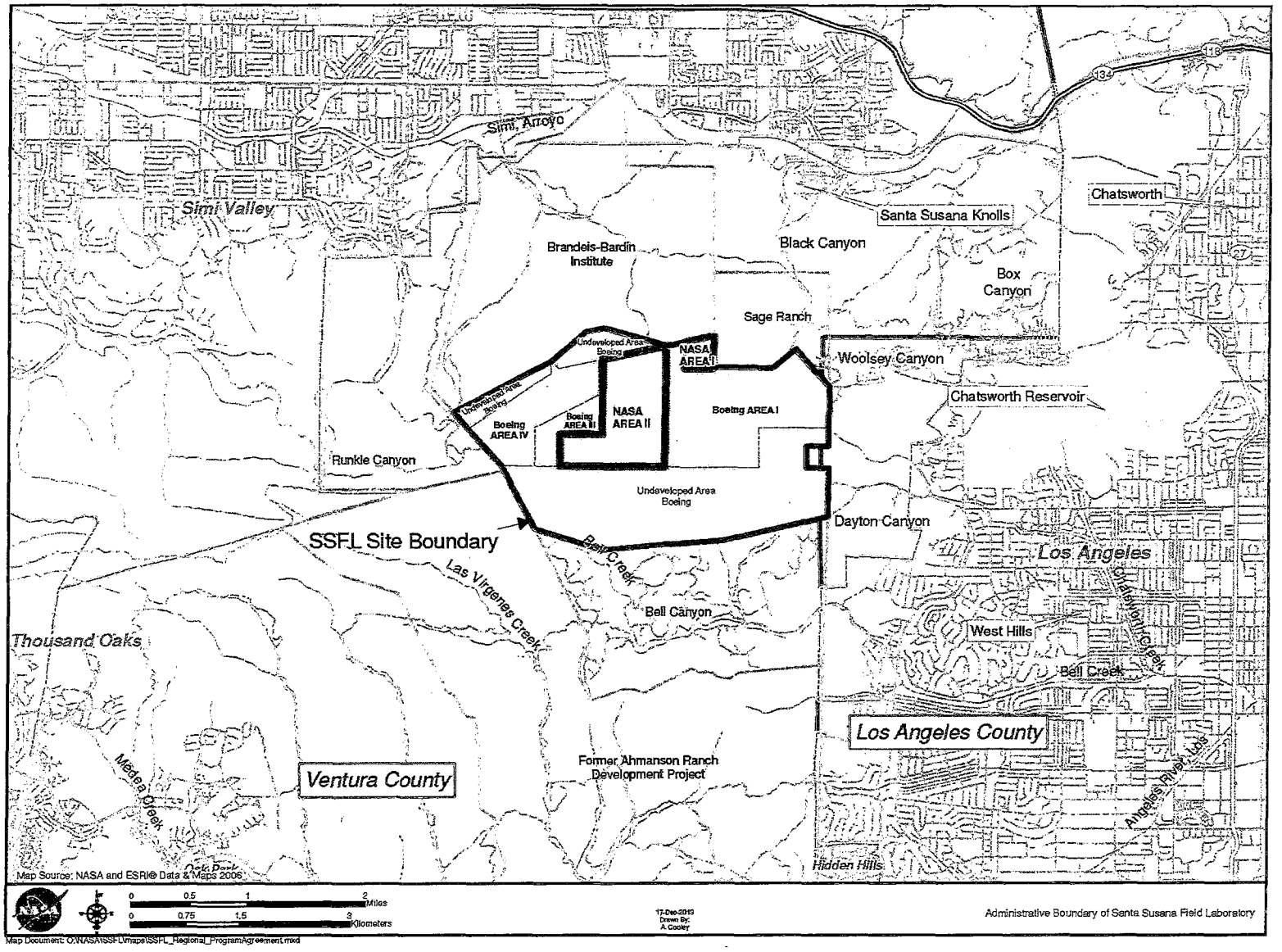
ATTACHMENT 1
Resources

Administrative Order on Consent, ("AOC") signed by NASA and the Department of Toxic Substances Control for the State of California on December 6, 2010. Copy is available at http://ssfl.msfc.nasa.gov/documents/governance/NASA_DTSC_Final_AOC_Dec_2010.pdf or upon request at SSFL Program Director, NASA MSFC AS01, Building 4494, Huntsville, AL 35812.

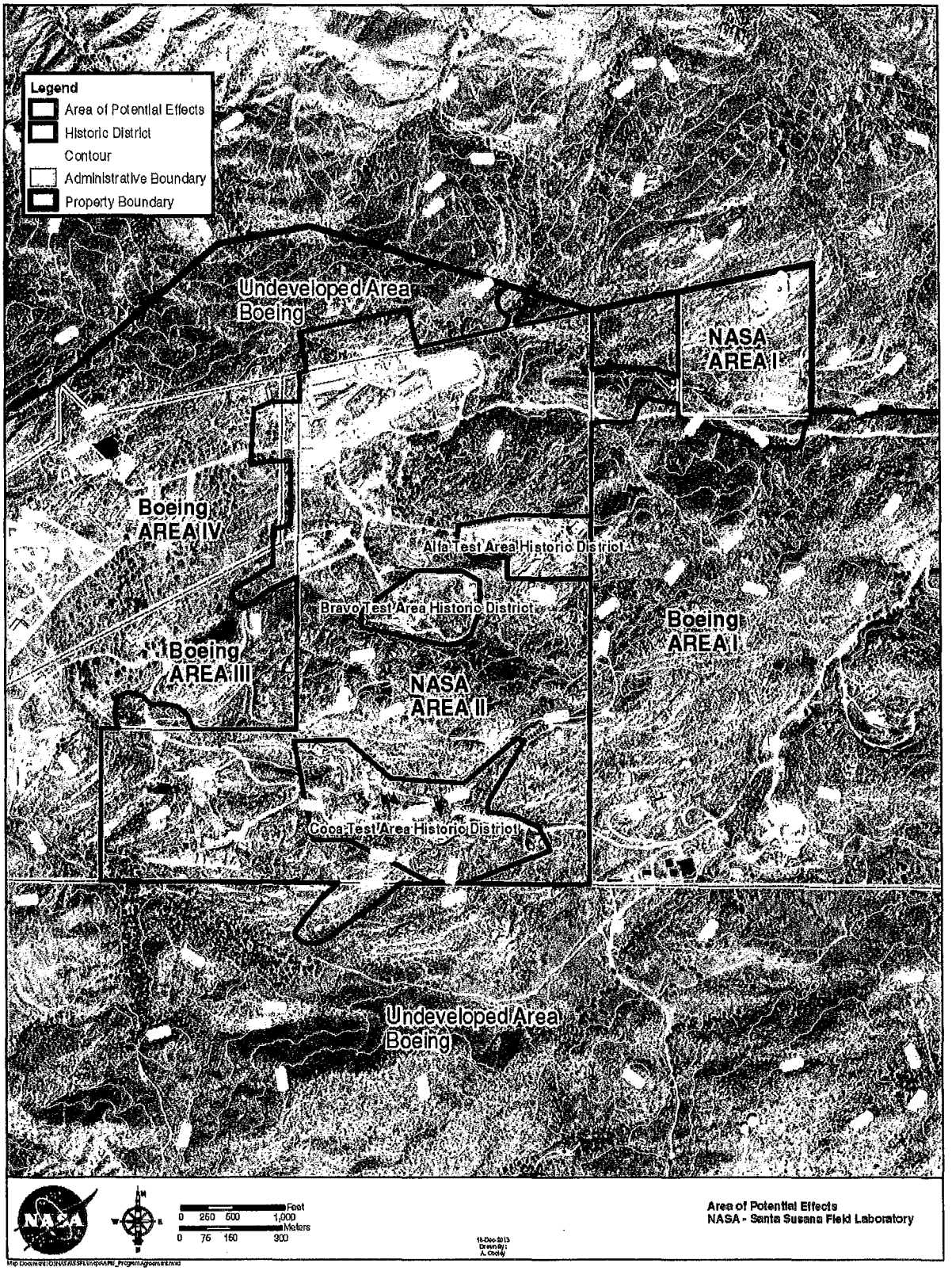
Consent Order for Corrective Action ("Consent Order") signed by NASA in August 2007. Copy is available at http://www.dtsc.ca.gov/SiteCleanup/Projects/upload/SSFL_COCA.pdf or upon request at SSFL Program Director, NASA MSFC AS01, Building 4494, Huntsville, AL 35812.

Integrated Cultural Resources Management Plan for Santa Susana Field Laboratory, Ventura County, California, January 2009-2013. Copy is available at http://ssfl.msfc.nasa.gov/documents/factsheets/ICRMP_SSFL_2009-2013.pdf or upon request at SSFL Program Director, NASA MSFC AS01, Building 4494, Huntsville, AL 35812.

ATTACHMENT 2
Administrative Boundary of Santa Susana Field Laboratory



ATTACHMENT 3
Area of Potential Effects Map



ATTACHMENT 4
Historic Structures and Districts in the NASA-administered Areas at Santa Susana Field Laboratory

Structure No.	Structure Name	NRHP Status	
		Individually Eligible	Contributes to a Historic District
Alfa Test Area Historic District			
2208	Alfa Control House	X	X
2209	Alfa Terminal House		X
2727	Alfa I Test Stand	X	X
2727A	Alfa I Electrical Control Station		X
2729	Alfa III Test Stand	X	X
2729A	Alfa III Electrical Control Station		X
2739	Standtalker Shack		X
2X	Alfa Observation Structure (Pill Box)		X
2Y	Alfa Observation Structure (Pill Box)		X
	Alfa Landscape/Spillway		X
Bravo Test Area Historic District			
2213	Bravo Control House	X	X
2214	Bravo Terminal House		X
2730	Bravo I Test Stand	X	X
2730A	Bravo I Electrical Control Station		X
2731	Bravo II Test Stand	X	X
2731A	Bravo II Electrical Control Station		X
2Z	Bravo Observation Structure (Pill Box)		X
	Bravo Landscape/Spillway		X
Coca Test Area Historic District			
2218	Coca Control Center	X	X
2222	Coca Pre-Test Building		X

ATTACHMENT 4
Historic Structures and Districts in the NASA-administered Areas at Santa Susana Field Laboratory

Structure No.	Structure Name	NRHP Status	
		Individually Eligible	Contributes to a Historic District
2235	Coca Electrical Control Station (LOX)		X
2236	Coca Electrical Control Station (LH2)		X
2237	Coca GH2 Compressor Building		X
2239	Coca GH2 Compressor Building		X
2241	Coca Pump House		X
2520	Coca High Pressure GH2 and GN2 Vault		X
2614	Coca IV Observation Structure (Pill Box)		X
2733	Coca I Test Stand	X	X
2787	Coca IV Test Stand	X	X
2A	Coca North Observation Structure (Pill Box)		X
2B	Coca Observation Structure (Pill Box)		X
V99	Coca GH2 Vessel		X
V100	Coca LH2 Vessel #1		X
V108	Coca LOX Vessel #1		X
	Coca Cable Tunnel		X
	Coca Landscape/Spillway		X

Notes:
GH2 = gaseous hydrogen
GN2 = gaseous nitrogen
LH2 = liquid hydrogen
LOX = liquid oxygen
NRHP = National Register of Historic Places

ATTACHMENT 5
List of Non-federally Recognized Tribes Contacted by NASA

Name	Affiliation
Charles Cooke	Chumash, Fernandeño, Tataviam, Kitanemuk
Beverly Salazar Folkes	Chumash, Tataviam, Fernandeño
James Ramos, Chairperson	Serrano
Ronnie Salas, Cultural Preservation Department	Fernandeño, Tataviam
Julie Lynn Tumamait	Barbareno/Ventureño Band of Mission Indians, Chumash
Patrick Tumamait	Chumash
Chief Mark Steven Vigil, San Luis Obispo County Chumash Council	Chumash
Owl Clan, Qun-tan Shup	Chumash
John Valenzuela, Chairperson San Fernando Band of Mission Indians	Fernandeño, Tataviam, Serrano, Vanyume, Kitanemuk
Randy Guzman - Folkes	Chumash, Fernandeño, Tataviam, Shoshone Paiute, Yaqui
Vennise Miller, Chairperson Coastal Band of the Chumash Nation	Chumash
Carol A. Pulido	Chumash
Melissa M. Parra-Hernandez	Chumash
Frank Arredondo	Chumash
Freddie Romero, Santa Ynez Band of Chumash Indians	Chumash

ATTACHMENT 6
List of Consulting Parties

Consulting Party	Affiliation
Mark Beason	California Office of Historic Preservation
Carla Bollinger	Santa Susana Mountain Park Association
Bill Bowling	Aerospace Contamination Museum of Education
Gary Brown	National Park Service
Harry Butowsky	private contractor
Michael Collins	Self; EnviroReporter.com
Nicole Doner	Ventura County Cultural Heritage Board
Wayne Fishback	Self, neighboring property owners
Beverly Folkes	Self
Elizabeth Harris	Self; Research Psychologist on Government-Funded Public Health Contracts
Luhui Isha	Self
Nancy Kidd	Simi Valley Historical Society
Christian Kiillkkaa	Self
Al Knight	Self
Dan Larson	Compass Rose Archaeological
John Luker	Santa Susana Mountain Park Association
Tom McCulloch	Advisory Council on Historic Preservation
Mark Osokow	San Fernando Valley Audubon Society
Carol Rowland-Nawi	California State Historic Preservation Officer
Gwen Romani	Compass Rose Archaeological
John Tommy Rosas	Tongva Ancestral Territorial Tribal Nation
Bruce Rowe	Self
Chris Rowe	Self
Alan Salazar	Self
Margie Steigerwald	National Park Service
Clark Stevens	Resource Conservation District of the Santa Monica Mountains
Susan Stratton	California Office of Historic Preservation
Brian Sujata	SSFL Community Advisory Group
George Toren	Compass Rose Archaeological
Barbara Tejada	Self, Ventura County Archeological Society
Mati Waiya	Self

ATTACHMENT 6
List of Consulting Parties

Consulting Party	Affiliation
Christina Walsh	Cleanuprocketdyne.org
Abraham Weitzberg	Self
Mary Wiesbrock	Save Open Space
Ronald Ziman	Self
Tribes	
Vincent Armenta	Santa Ynez Band of Chumash Indians, Tribal Chairman
Sam Cohen	Santa Ynez Band of Chumash Indians
Freddie Romero	Santa Ynez Band of Chumash Indians, Elders Council
SSFL Participating Agencies	
James Biederman	General Services Administration
Jane Lehman	General Services Administration
Maureen Sheehan	General Services Administration
Other Agencies	
Paul Carpenter	Department of Toxic Substances Control
Richard Hume	Department of Toxic Substances Control
Ray Leclerc	Department of Toxic Substances Control
Mark Malinowski	Department of Toxic Substances Control

Note: Listing as a Consulting Party does not necessarily indicate agreement with the stipulations codified in this document.

ATTACHMENT 7
Inadvertent Discovery Plan

AMMENDED Excerpt from the Integrated Cultural Resources Management Plan for Santa Susana Field Laboratory, Ventura County, California

SOP 3: Responding to Inadvertent Discovery of Archeological Deposits

Regardless of whether an archeological inventory has been completed and regardless of whether a planned undertaking has been assessed for its effect on known historic properties, every undertaking that disturbs the ground surface has the potential to discover buried and previously unknown archeological deposits. This SOP outlines the policies and procedures to be followed in such cases.

Applicable Laws/Regulations/Procedural Requirements:
National Historic Preservation Act
National Environmental Policy Act
Archeological and Historic Preservation Act
Archeological Resource Protection Act
Native American Graves Protection and Repatriation Act
NASA Procedural Requirements 8580.1

Policy
Archeological deposits that are newly discovered during any undertaking shall be evaluated for their NRHP eligibility. Until NASA has determined an archeological site is ineligible, all known sites will be treated as potentially eligible and will be avoided insofar as possible. In the event that an archeological deposit is inadvertently discovered, work must cease within a 30 meter radius, the Cultural Resources Manager ("CRM") and the SHPO must be notified within two working days (e.g., letter or email notification), and a professional archeologist (meeting the Secretary of Interior's Professional Qualifications), must be consulted.

If the professional archeologist recommends that the archeological deposit is potentially eligible, the CRM will consult with the CA SHPO and federally recognized Native American tribes on the need for further testing and/or data recovery for those sites eligible under only Criterion D. If the undertakings may affect properties having historic value to any federally recognized Indian tribes with which NASA consults, the CRM will consult with the tribes and give them an opportunity to participate as interested persons during the consultation process. In the event that human remains are inadvertently discovered, work must cease in the area of the discovery and the CRM must be notified. If remains are determined to be Native American, federally recognized American Indian tribes will be notified.

Procedure.
I. Workers will notify the CRM immediately upon the discovery of possible archeological deposits. (Standard language will be placed in contracts requiring contractors to notify the CRM immediately upon discovery of possible archeological deposits.)

When notified of the possible discovery of unexpected buried archeological material, the CRM will arrange to have a professional archeologist evaluate the site. Work will cease and the site will be protected pending the results of the evaluation.

A. If fossils, natural stones, concretions, or other such items that are sometimes mistaken for archeological materials are recovered, then the CRM may allow the excavation to proceed without further action.

B. If disturbances to the deposit have been slight and that portion of the Undertaking can be relocated to avoid the buried site, the CRM shall have the site recorded and forms submitted to the appropriate California Historical Resources Information System (CHRIS) in a routine manner, having avoided adverse impact through relocation of the proposed undertaking.

C. If the location of that portion of the Undertaking cannot be changed, the CRM shall contact the CA SHPO by telephone or email within forty-eight (48) hours, report the discovery and initiate emergency consultation.

1. If the deposits are evaluated as ineligible for inclusion on the NRHP by a professional archeologist in consultation with the CA SHPO, then NASA will prepare a memorandum for record, to be included in the site record. NASA may allow the excavations to proceed and shall advise the excavation foreperson(s) of the possibility and nature of additional discoveries that would require immediate notification of the CRM.

2. If, in the opinion of the professional archeologist, the existing information is deemed insufficient to make a determination of eligibility, then an emergency-testing plan will be developed by NASA in coordination with the CA SHPO and SYBCI. Further excavation in the vicinity of the site will be suspended until an agreed testing procedure has been carried out and sufficient data has been gathered to allow a determination of eligibility.

a) If the CA SHPO and SSFL CRM agree after testing that the site is ineligible for inclusion to the NRHP, then work on the that portion of the Undertaking may resume.

b) If the site appears to be eligible for inclusion on the NRHP, or if NASA and the CA SHPO cannot agree on the question of eligibility, then NASA shall implement the following alternative actions, depending on the urgency of the action being delayed by the discovery of cultural material.

1) NASA may relocate that portion of the Undertaking to avoid adverse effect.

2) NASA may request that the site be exempted from cleanup activities if applicable to DTSC as a Native American Artifact in accordance with the AIP.

3) NASA may seek the opinion of the Keeper of the NRHP

4) -NASA may proceed with a Research Design and data recovery plan in accordance with Stipulation III.F-G

5) NASA may request comments from the ACHP and may develop and implement actions that take into account the effects of the undertaking and the comments of the CA SHPO, federally recognized tribes, and the ACHP. Interim comments must be provided to NASA within 48 hours and formal comments within 30 days.

II. If examination by a professional osteologist indicates the materials are of human origin, an archeologist must make a field evaluation of the primary context of the deposit and its probable age and significance, record the findings in writing, and document the materials.

A. If at any time human remains, funerary objects, or Native American sacred objects are discovered, the CRM will ensure that the provisions of NAGPRA, ARPA and/or AIRFA are implemented.

B. The CRM will begin consultation with federally-recognized tribes.

ATTACHMENT 8
Human Remains and Funerary/Sacred Objects Discovery Plan

AMMENDED Excerpt from the Integrated Cultural Resources Management Plan for Santa Susana Field Laboratory, Ventura County, California

SOP #4 Treatment of Human Remains and Funerary/Sacred Objects

The NAGPRA requires the inventory of human remains and funerary and sacred objects recovered from Federal lands that may be subject to claim by Native American tribal groups. The NAGPRA also requires active consultation with such groups to determine the disposition of such remains and objects. No Native American human remains or sacred/funerary objects are currently known to exist on the SSFL; however, previously undocumented excavations may have encountered human remains and/or sacred/funerary objects and future undertakings may inadvertently encounter these materials. This SOP outlines the policies and procedures to be followed to ensure future compliance with the NAGPRA.

Applicable Laws/Regulations

- Native American Graves Protection and Repatriation Act.
- American Indian Religious Freedom Act Policy.

No Native American human remains, funerary objects, or sacred objects from the SSFL will be knowingly kept in Government possession without preparation of an inventory and initiating consultation.

Consultation regarding the disposition of Native American human remains, funerary objects, or sacred objects shall be initiated as soon as feasible.

Procedure

The Cultural Resources Manager ("CRM") will ensure that NASA complies with NAGPRA requirements and the implementing regulations (43 CFR Part 10).

I. The CRM will review all records and collections to determine whether any human remains, funerary objects, or sacred objects originating from the SSFL are known to exist.

   A. If no such objects are found, no consultation is required.

   B. If any such objects are found to be uninventoried, the CRM will prepare an inventory of all such objects and will initiate consultation procedures with the Archeological Assistance Division National Park Service (Post Office Box 37127, Washington, D.C. 20013; telephone 202–343–4101; facsimile 202–523–1547) and federally recognized tribes to determine appropriate disposition.

II. If human remains or artifacts that are not currently in Government possession but that are suspected to be from the SSFL are returned to the Government, the CRM will arrange to have a qualified professional examine and evaluate them.

A. If the remains are not of human origin, then no further action by the CRM is necessary.

B. If the remains are not of Native American origin, then they will be treated as stipulated as an emergency discovery of archeological deposits (see SOP #3).

C. If the remains are of Native American origin, then the CRM will prepare an inventory of the remains and initiate consultation procedures with the Archeological Assistance Division, NPS.

III. If human remains are discovered during the course of any undertaking, the following procedures will apply:

A. Work will immediately cease in the vicinity of the human remains.

B. The site supervisor will immediately notify SSFL/MSFC Law Enforcement/Center Protective Services and the CRM.

1. SSFL Law Enforcement/Center Protective Services officers will notify the County Coroner within 48 hours, the State Health and Safety Code Section 7050.5 states that no further disturbance shall occur until the County Coroner has made a determination of origin and disposition pursuant to Public Resources Code Section 5097.98.

a) If the Coroner determines the human remains to be Native American, the Coroner is responsible for contacting the NAHC within 24 hours after the determination is made. The NAHC, pursuant to Section 5097.98, immediately will notify those persons it believes to be most likely descended from the deceased Native American so they can inspect the burial site and make recommendations for treatment or disposal. After the Coroner has established whether the remains are archeological or historical, NASA will follow the California state requirements. If the remains are prehistoric, NASA will initiate the proper procedures under the Archeological Resources Protection Act of 1979 and/or the NAGPRA to decide the disposition of the materials. If the remains are found to be Native American, the steps outlined in NAGPRA, 43 CFR 10.6 (Inadvertent Discoveries) must be followed.

b) If the remains are not of Native American origin, then the site will be treated as the discovery of emergency archeology deposits. However, it should be noted that not all human remains, cemeteries, etc., are NRHP properties.

c) If the remains are of Native American origin, then further work in the vicinity will be suspended for 30 days to allow for consultation, as required by the NAGPRA. If any photographs are taken of the undertaking, only general photographs of the site area are to be taken. Prior to removal of any remains, the CRM will prepare an

inventory of the remains and will immediately initiate emergency consultation procedures with the Archeological Assistance Division, NPS, and tribes.

C. If consultation allows the remains to be removed, then the CRM will cause the remains to be treated and disposed in accordance with the consultation.

D. Notwithstanding the results of consultation, the CRM will ensure that Section 106 procedures are adhered to with regards to evaluating sites.

Appendix E. National Aeronautics and Space Administration's Procedural Requirements

NASA Procedural Requirements

NPR 8510.1
Effective Date: June 20, 2012
Expiration Date: June 20, 2017

COMPLIANCE IS MANDATORY

NASA Cultural Resources Management

Responsible Office: Office of Strategic Infrastructure Capabilities

Table of Contents

Preface

P.1 Purpose

a. This NASA Procedural Requirement (NPR) implements applicable requirements for the Cultural Resources Management (CRM) Program under NASA Policy Directive (NPD) 8500.1, NASA Environmental Management, in accordance with the National Historic Preservation Act of 1966 (NHPA), as amended, 16 U.S.C. 470 et seq.; its implementing regulations (Protection of Historic Properties, 36 C.F.R. Part 800); the Archaeological Resources Protection Act of 1979, 16 U.S.C. 470; Executive Order (Exec. Order No.) 13287; Preserve America, and the National Environmental Policy Act of 1970 (NEPA), 42 U.S.C. 4321 and 4331-35; and its Council on Environmental Quality (CEQ) regulations.40 C.F.R. Part 1501.

b. This NPR establishes requirements, roles, and responsibilities for Native American Consultation (NAC) in accordance with the Native American Graves Protection and Repatriation Act, 25 U.S.C. 3001 et seq. and its Final Rule (43 C.F.R. Part 10); the American Indian Religious Freedom Act, as amended, 42 U.S.C. 1996 and 1996a; Religious Freedom Restoration Act, 42 U.S.C. §2000bb - 42 U.S.C. § 2000bb-4; Exec. Order No. 13007, Indian Sacred Sites; Exec. Order No. 13175, Consultation and Coordination with Indian Tribal Governments; and other laws, regulations, and Exec. Orders related to cultural resources.

c. NASA is committed to be a steward of cultural resources, and implementation of this NPR will ensure preservation of their significance to NASA's mission, communities, and the history of our Nation in accordance with The Secretary of the Interior's Standards and Guidelines for Federal Agency Historic Preservation Programs Pursuant to the National Historic Preservation Act, 63 Federal Register (Fed. Reg.) 20496 (April 24, 1998).

P.2 Applicability

a. This NPR applies to NASA Headquarters and all Centers, including Component Facilities and to the Jet Propulsion Laboratory (JPL); other contractors; grant recipients; and licensees or parties to agreements only to the extent specified or referenced in the appropriate contracts, grants, or agreements.

b. NASA Mission Directorates will reference this NPR in policy and guidance affecting NASA's cultural resources, including the requirement to fund programs and projects to meet NHPA compliance requirements.

c. NASA institutional and support offices will reference this NPR in policy and guidance documents that involve or affect NASA's cultural resources and will support the Cultural Resources Management Program through appropriate public outreach and events.

d. In this NPR, the language "shall" denotes a mandatory action, "may" or "can" denote discretionary privilege or permission, "should" denotes good practice that is recommended but not required, "will" denotes expected outcome, and "are/is" denotes descriptive material.

e. In this NPR, all document citations are assumed to be the latest version, unless otherwise noted.

P.3 Authority

a. The National Aeronautics and Space Act, 51 U.S.C. § 20113(a)

b. National Historic Preservation Act, 16 U.S.C. 470 et seq. (1966)

c. Archaeological Resources Protection Act, 16 U.S.C. § 470aa-470mm (1979)

d. Native American Graves Protection and Repatriation Act (NAGPRA), 25 U.S.C. 3001 et seq. (1990)

e. Federally Recognized Indian Tribe List Act, 25 U.S.C. 479a (1994)

f. Religious Freedom Restoration Act, 42 U.S.C. § 2000bb-42 U.S.C. § 2000bb-4 (1993)

g. National Environmental Policy Act, 42 U.S.C. § 4321 and §§ 4331-4335 (1970)

h. American Indian Religious Freedom Act, 42 U.S.C. (1996)

i. Protection and Enhancement of the Cultural Environment, Exec. Order No. 11593, 3 C.F.R. 8921, 1971-1975 Comp., p. 559 (1971)

j. Environmental Effects Abroad of Major Federal Actions, Exec. Order No. 12114, 44 FR 1957, 3 C.F.R., Comp., p. 356 (1979)

k. Indian Sacred Sites, Exec. Order No. 13007, 3 C.F.R., 1996 Comp., p. 196 (1996)

l. Protection of Historic Properties (The Advisory Council on Historic Preservation's Regulations for Implementing Section 106 of NHPA), 36 C.F.R. pt. 800

m. Consultation and Coordination with Indian Tribal Governments, Exec. Order No. 13175, 65 Fed. Reg. 67249, p. 67249-67252 (2000)

n. Preserve America, Executive Order No. 13287, 68 Fed. Reg. 43, p. 10635-10638 (2003)

o. Federal Real Property Asset Management, Executive Order No. 13327, 73 Fed. Reg. 2167, p. 2167-2168 (2004)

p. Locating Federal Facilities on Historic Properties, Executive Order 13006, 61 Fed. Reg. 35736, p. 35736 (1996)

q. NPD 8500.1, NASA Environmental Management

P.4 Applicable Documents and Forms

a. National Register of Historic Places, 36 C.F.R. pt. 60 (1981)

b. Procedures for State, Tribal, and Local Government Historic Preservation Programs, 36 C.F.R. pt. 61 (1999)

c. National Historic Landmarks Program, 36 C.F.R. pt. 65 (1983).Secretary of the Interior's Standards for the Treatment of Historic Properties, 36 C.F.R. pt. 68 (1995)

d. Curation of Federally-Owned and Administered Archaeological Collections, 36 C.F.R. pt. 79 (1990)

e. Native American Graves Protection and Repatriation Act Regulations, 43 C.F.R. pt. 10 (1995)

f. Presidential Memorandum, Government-to-Government Relations with Native American Tribal Governments, Fed. Reg. Doc. 94-10877, May 4, 1994

g. Presidential Memorandum, Tribal Consultation, Fed. Reg., Nov. 9, 2009, pp. 57879-57882

h. Secretary of the Interior's Standards and Guidelines for Federal Agency Historic Preservation, 63 Federal Register Doc. 20496 (1998)

i. NPD 1000.0, Strategic Management and Governance Handbook

j. NPD 1000.3, The NASA Organization

k. NPD 1440.6, NASA Records Management

l. NPD 8500.1, NASA Environmental Management

m. NPD 8800.14, Policy for Real Estate Management

n. NPD 8820.2, Design and Construction of Facilities

o. NPR 1441.1, NASA Records Retention Schedules

p. NPR 4200.1, NASA Equipment Management Procedural Requirements

q. NPR 4310.1, Identification and Disposition of NASA Artifacts

r. NPR 7120.5, NASA Space Flight Program and Project Management Requirements

s. NPR 8553.1, NASA Environmental Management System

t. NPR 8800.15, Real Estate Management Program

u. NPR 8820.2, Facility Project Requirements

v. NPR 8820.2, Design and Construction of Facilities

w. Statement of Federal Financial Accounting Standards No. 29, Heritage Assets

and Stewardship Land, July 7, 2005

P.5 Measurement/Verification

a. For Agency-level requirements, metrics are to be developed to reflect existing and future reporting requirements of Congress, the Office of Management and Budget, the Advisory Council on Historic Preservation, the Department of the Interior, and other external oversight agencies, as needed.

b. The NASA Headquarters Environmental Management Division (EMD) conducts an Environmental Functional Review (EFR), including an audit of the Environmental Management System, in accordance with NPR 8553.1 every three years.

P.6 Cancellation

NASA Interim Directive (NID 8500-80), Cultural Resource Management Policy, dated Sept. 21, 2009.

/S/
Dr. Woodrow Whitlow, Jr.
Associate Administrator
Mission Support Directorate

Chapter 1. Cultural Resources Management (CRM) Program Roles and Responsibilities

1.1 Introduction

1.1.1 The roles and responsibilities of senior management are defined in NPD 1000.0, Strategic Management and Governance Handbook, NPD 1000.3, The NASA Organization, and NPD 8500.1, NASA Environmental Management. The following are key roles and responsibilities for establishing, assigning, and maintaining CRM Program requirements. Responsibilities specific to a position title may be delegated by the responsible person.

1.2 Headquarters

1.2.1 The Assistant Administrator for the Office of Strategic Infrastructure (OSI) shall:

a. Serve as and fulfill the Senior Policy Official (SPO) responsibilities specified in EO 13287, Preserve America, including appointing a Federal Preservation Officer (FPO).

b. Promulgate CRM policy and guidance, and promote cultural resources management requirements across NASA.

c. Represent NASA in establishing a Government-to-Government relationship with Federally recognized tribes unless otherwise delegated to Center and Component Facility Directors. (See Federally Recognized Indian Tribe List Act of 1994, 25 U.S.C. 479a and Presidential Memorandum, Government-to-Government Relations with Native American Tribal Governments, Fed. Reg. Doc. 94-10877, May 4, 1994.)

1.2.2 Headquarters CRM Program Manager shall:

a. Fulfill the requirements of the FPO in accordance with the NHPA and Exec. Order No. 13287, Preserve America.

b. Serve as the Agency liaison for Native American affairs.

c. Oversee and coordinate NASA's activities under NHPA and other applicable laws, regulations, Exec. Orders, and Presidential Memoranda regarding cultural resources.

d. Prepare the Agency CRM policy and guidance.

e. Monitor CRM Program implementation through the issuance of data calls; EFRs, at least every three years; and metrics.

f. Establish a CRM awareness program to educate and inform NASA of its historic properties and CRM responsibilities.

g. Ensure the Agency NASA Environmental Tracking System (NETS) CRM database is validated and maintained by Center and Component Facilities Historic Preservation Officers (HPOs).

h. Provide direction and guidance on the Agency's CRM Program and NAC to Centers and Mission Directorates.

i. Sign nominations of NASA-administered historic properties to the National Register of Historic

Places (NRHP).

j. Promote the mission, economic, and social benefits of the CRM Program within Agency leadership.

k. Develop Programmatic Agreements (PAs) and Memoranda of Agreement (MOAs) on behalf of the Agency.

l. Monitor Agency compliance with the management and reporting requirements of NHPA and other applicable statutes, regulations, and Executive Orders (EOs) related to CRM.

m. Review and concur with Center and Component Facility Integrated Cultural Resources Management Plans (ICRMPs), NHPA PAs or MOAs, Native American Graves Protection and Repatriation Act (NAGPRA) Comprehensive Agreements and Plans of Action, and other cultural resources agreements and actions after legal review.

n. Coordinate with NASA procurement office to include contract and grant clauses that cover cultural resources issues, as appropriate.

o. Represent the Agency and CRM Program at external and internal meetings (e.g., FPO meetings, CRM Panel Meetings, and Advisory Council on Historic Preservation (ACHP) meetings).

p. Ensure that the Agency's cultural resources records are retained in compliance with NHPA requirements, 36 C.F.R. pt. 79, NPD 1440.6, and NPR 1441.1.

q. Assist Center and Component Facility HPOs in interaction with the ACHP, Secretary of the Interior, Native Americans, and NASA Administrator with matters regarding CRM.

r. Update and prepare reports on heritage assets for financial reporting in accordance with Statement of Federal Financial Accounting Standards No. 29, Heritage Assets and Stewardship Land, July 5, 2005 (SFFAS No. 29) and NPR 9250.1, Property, Plant, and Equipment and Operating Materials and Supplies.

1.2.3 The Headquarters Facilities Engineering Division shall:

a. Support the implementation of NASA's CRM Program through policy pursuant to NPD 8800.14, Policy for Real Estate Management, NPD 8820.2, Design and Construction of Facilities, and guidance pursuant to NPR 8800.15, Real Estate Management Program, and NPR 8820.2, Facility Project Requirements.

b. Reference this NPR in Agency policy, guidance, and training material that relate to the management of real property.

c. Consider cultural resources requirements when implementing the Agency Construction of Facilities (CoF) Program.

1.2.4 The Headquarters Technical Capabilities and Real Property Management Division shall:

a. Provide real property data to HPOs for use in the NETS database CRM Module.

b. Utilize data provided in the NETS CRM Module to populate the historic status and heritage asset fields in the Agency real property database.

c. Maintain up-to-date information for heritage assets for financial reporting in accordance with SFFAS No. 29.

1.2.5 Mission Program and/or Project Managers shall:

a. Coordinate with NASA's FPO or Center HPO, as appropriate, prior to development of project budgets and planning documents to ensure cultural resources management issues both within and outside the United States and are considered and programmed for during project formulation phase and reevaluated throughout implementation in accordance with NHPA, Exec. Order 12114, NPR 7120.5, NASA Space Flight Program and Project Management Requirements, and NPR 8820.2, Facility Project Requirements.

b. Coordinate NASA's FPO or Center HPO regarding any closeout activities associated with programs and projects that are terminating to identify potential NHPA and NAC cultural resources management issues that may require budget and compliance considerations.

c. Notify the FPO or the Center HPO immediately if an activity is likely to affect an historic property or results in discovery of archaeological resources or human remains, or impact to a property that has been identified as culturally significant by Federally recognized tribes, Alaskan Natives, or Native Hawaiian Organizations.

1.3 Centers and Component Facilities

1.3.1 Center or Component Facility Directors shall:

a. Comply with the applicable laws, regulations, and EOs related to cultural resources.

b. Ensure funding is available to implement and maintain NASA CRM Program activities at the Center or Component Facility.

c. Serve as the Federal Agency Official in accordance with NHPA, as defined in 36 C.F.R. pt. 800, Protection of Historic Properties.

d. Serve as the Federal Land Manager for complying with the Archaeological Resources Protection Act of 1979 (ARPA).

e. Serve as the Federal Agency Official, as defined in 36 C.F.R. pt. 79, with management authority over the Center or Component Facility's archaeological collections.

f. Ensure funding is available to coordinate the disposition of archaeological collections and associated records in curation facilities that comply with the requirements in 36 C.F.R. pt. 79, NHPA, ARPA, and other applicable regulations.

g. Ensure that Center procedures are aligned with the Agency requirements for cultural resources compliance, records retention, and disposal of artifacts. (See NPR 4310.1, Identification and Disposition of NASA Artifacts.)

h. Appoint an HPO for the Center or Component Facility to manage and implement the CRM Program.

i. Notify, in writing, the Headquarters CRM Program Manager and the respective State Historic Preservation Officer (SHPO) of the HPO appointment.

j. Ensure that the HPO has the authority and resources to carry out their role and responsibilities to comply with applicable CRM regulations and this NPR and has funding to conduct periodic inventory and evaluation of historic facilities. (See NHPA and Exec. Order No. 11593.)

k. Ensure that the HPO is included in the process for collecting, identifying, retaining, and disseminating historic and cultural resources documentation, records, and artifacts.

l. Establish a process for integrating CRM into Center master and mission planning that includes early coordination with other programs, tenants, and projects.

m. Submit to the FPO nominations to the NRHP of those historic properties whose designation the Center Director deems to be a net benefit to NASA and the community.

n. Support initiatives to educate and inform Center or Component Facility personnel of CRM and NAC compliance responsibilities and include Center Native American employees, as appropriate.

o. Ensure the integration of CRM responsibilities within program and project requirements.

p. Obtain appropriate training regarding Government-to-Government consultation to qualify for delegated authority from the Assistant Administrator.

1.3.2 Center or Component Facility Historic Preservation Officers shall:

a. Implement NASA CRM Program activities in compliance with this NPR and sections 106 and 110 of NHPA.

b. Develop and implement an ICRMP that meets the requirements of this NPR to identify, manage, and maintain cultural resources.

c. Ensure the ICRMP is integrated with other Center and Component Facility documents (e.g., Environmental Management System, Master Plan, and asset management plans).

d. Submit the ICRMP to the Headquarters CRM Program Manager for review and concurrence.

e. Review and update the ICRMP every five years or when directed by the Headquarters CRM Program Manager.

f. Ensure that unanticipated archaeological discoveries are managed in compliance with NAGPRA, ARPA, state regulations, and NASA internal procedures.

g. Notify the Headquarters CRM Program Manager and State and local authorities in accordance with NAGPRA, state laws and regulations, and NASA internal procedures regarding discovery of human remains.

h. For those who consult regularly with Indian Tribes or Native Hawaiian Organizations, as defined by NAGPRA, develop a Comprehensive Agreement or Plan of Action to assist with compliance with NAGPRA.

i. Ensure that identification and evaluation of historic properties, including properties of traditional religious and cultural importance to Native Americans, are completed in compliance with Section 106 of NHPA prior to an undertaking.

j. Ensure that impacts of proposed actions and undertakings that might affect cultural resources are considered pursuant to NEPA and NHPA.

k. Serve as the Center or Component Facility point of contact to maintain and foster relationships with the Headquarters CRM Program Manager; SHPO; Tribal Historic Preservation Officer (THPO), for activities affecting tribal lands; Native Americans; ACHP; other consulting and interested parties; and the public, for activities related to the CRM Program.

l. Provide timely responses to Agency CRM data calls (e.g., EO 13287, Preserve America, and ARPA).

m. Track cultural resources and maintain up-to-date records and reports (i.e., documentation of

cultural resources surveys and studies, MOAs/PAs, and official correspondence) in the NETS CRM Module for compliance with NHPA, the Archaeological Resources Protection Act of 1979, Exec. Order No. 13327, and Exec. Order No. 13287.

n. Consult with the regional National Park Service (NPS) regarding National Historic Landmarks (NHL), as appropriate, and NRHP nominations. (See 36 C.F.R. pt. 65, National Historic Landmarks Program.)

o. Notify Headquarters of any proposed undertaking that is likely to directly and adversely affect any NHL.

p. Obtain necessary training to fulfill CRM responsibilities. If the employee is not a CRM professional, as defined by 36 C.F.R. pt. 61, the HPO will complete training on NHPA within 12 months of designation to allow the HPO to perform their duties.

q. Determine when official CRM records need to be retained or scanned and uploaded into NETS prior to submission to the National Archives and Records Administration or other disposition in accordance with NPR 1441.1, NASA Records Retention Schedules.

r. Notify the Headquarters CRM Program Manager prior to any Section 106 consultation under NHPA that requires consultation with the ACHP, Native Americans, or in the development of any other agreement with these consulting parties prior to such consultation.

s. Safeguard information about the location, character, or ownership of an historic property or archaeological sites if such disclosure might cause harm or might impede the access to or use of properties of traditional religious and cultural importance.

t. Encourage development of partnerships in accordance with Exec. Order No. 13287, Preserve America, to support and foster public-private initiatives and investment in the use, reuse, and rehabilitation of historic properties.

u. Review all construction and demolition projects that pertain to historic properties to determine likely effect of the proposed activity on the historic property and initiate compliance procedures, as appropriate.

v. Ensure the Secretary of the Interior's Standards for the Treatment of Historic Properties are followed as closely as practical for Center projects involving historic properties.

w. Report existing condition of NHLs to NPS, as requested.

1.3.3 Center and Component Facility Project Managers shall:

a. Reference this NPR in applicable program and project planning documents in accordance with NPR 7120.5, NASA Space Flight Program and Project Management Requirements, and NPR 8820.2, Design and Construction of Facilities.

b. Coordinate with the HPO to identify potential NHPA and NAC requirements when planning new mission needs and construction, renovation, or demolition/deconstruction activities.

c. Include cost and schedule needs for NHPA compliance and NAC activities in proposed project plans at the earliest stages of planning.

d. Ensure applicable forms are completed and permits obtained during the project planning phase and prior to project startup (e.g., environmental checklists, siting requests, and dig permits).

e. Notify the HPO immediately if an activity results in discovery of archaeological resources or human remains, or the activity impacts an historic property that has been identified as culturally

significant by Native Americans.

f. Consider alternatives for historic properties that are not needed for current or projected Agency or Center mission requirements in accordance with NASA's sustainability goals and Section 111 of NHPA, including adaptive reuse or lease. (See Exec. Order No. 13423.)

g. Ensure that contracts, licenses granted by NASA, and grant requirements include NHPA and NAC compliance activities and limit the issuance of notice-to-proceed orders in accordance with appropriate compliance activities. h. Consult with the HPO to identify requirements for NAC and consideration of potential impact to properties of tribal significance when planning construction, demolition, or deconstruction activities.

Chapter 2. Integrated Cultural Resources Management Plan

2.1 Overview

2.1.1 A key component of a Center's management responsibilities is the ICRMP. Each NASA Center and Component Facility is responsible for implementing NASA CRM and stakeholder engagement practices, as described in a Center or Component Facility ICRMP. The ICRMP establishes cultural resources management practices and procedures pursuant to Section 110 of NHPA for historic properties. The ICRMP should be developed in coordination with the Center or Component Facility's other significant planning documents, such as Master Plans.

2.2 Integrated Cultural Resources Management Plan

2.2.1 The ICRMP shall contain a summary of the Center and Component Facility's mission and history.

2.2.2 The ICRMP shall include, at a minimum, standard operating procedures (SOP) for:

a. Identifying and evaluating resources that are 45 years of age or older (in anticipation of their turning 50) and resources less than 50 years old that may have exceptional significance in accordance with Section 110 of NHPA.

b. Reassessing resources that have previously been determined eligible or ineligible for listing in the NRHP prior to their turning 50 years of age to address the passage of time, changing perceptions of significance, subsequent changes to the property, or incomplete prior evaluations.

c. Maintaining, repairing, altering, demolishing, leasing, or transferring existing buildings or structures.

d. Identifying, evaluating, and treating the effects of all undertakings on historic properties through Section 106 of NHPA consultation to include the public, Native Americans, SHPOs/THPOs, and other consulting parties in a manner that reflects the nature and complexity of the undertaking and its effects on historic properties.

e. Protecting archaeological resources.

f. Responding to inadvertent discovery of archaeological resources.

g. Treatment of human remains and funerary objects.

h. Consulting with Native Americans. (See Exec. Order No. 13175 and Presidential Memoranda.)

i. Curating archaeological collections and records of historic properties.

j. Emergency procedures in the event of natural or other disasters.

2.2.3 The ICRMP shall outline procedures that Centers and Mission Programs will follow for real estate actions, construction projects, and planning to ensure that stewardship responsibilities of the Agency are considered in accordance with relevant laws, Exec. Orders, and Presidential Memoranda.

2.2.4 The ICRMP shall document management practices to:

a. Develop Center historical context information using broad thematic studies, such as Man in Space, the former U.S. Space Shuttle Program, and Center histories.

b. Ensure that personal property and associated records are considered when evaluating historic properties.

c. Participate in the identification and disposition of artifacts with appropriate Center and Component Facility organizations and Property Disposal Officers and/or Artifact Managers, especially as it relates to the management of these artifacts as potential historic properties.

d. Account for heritage personal property in the NASA Personal Property, Plant, and Equipment System when valuation meets the Agency accountability threshold in accordance with NPR 4200.1, NASA Equipment Procedural Requirements and NPR 9250.1, Property, Plant, and Equipment and Operating Material and Supplies.

e. Ensure that action of the Center or Component Facility and its tenants are planned and carried out in ways that protect and enhance its cultural resources.

f. Maintain all eligible or listed (i.e., registered) historic properties in accordance with Section 110 of NHPA.

g. Safeguard locations of archaeological resources in accordance with the requirements of existing ARPA and NHPA regulations.

h. Identify the Area of Potential Effect for Section 106 of NHPA undertakings, and identify and evaluate historic properties to include archaeological sites and places of traditional religious and cultural importance prior to the commencement of any undertaking.

i. Delineate treatment and mitigation measures in a MOA or PA with SHPO/THPO, other consulting/interested parties, and the ACHP.

j. Integrate historic properties into comprehensive master planning and project development.

k. Identify the location of and manage archaeological collections and associated records in facilities that meet the requirements of 36 C.F.R. Part 79.

l. Develop comprehensive agreements and/or plans of action in consultation with Federally recognized tribes, in accordance with NAGPRA.

m. Provide access to and use of sacred sites in order to accommodate ceremonial use by Indian religious practitioners. (See Exec. Order No. 13007.)

Appendix A. Definitions

Advisory Council on Historic Preservation. The independent Federal agency charged by NHPA to advise the President, Congress, and Federal Agencies on matters related to historic preservation. The Council also administers Section 106 of NHPA through 36 C.F.R. Part 800, Protection of Historic Properties.

Archaeological Resources. Material remains of human life or activities that are capable of providing understanding of behavior and cultural adaptation through the application of scientific or scholarly techniques, such as controlled observation, contextual measurement, controlled collection, analysis, interpretation, and explanation.

Consultation. A reasonable and good-faith effort to involve affected parties in the findings, determinations, and decisions made during the Section 106 review of the NHPA process and other processes required under NAGPRA, NEPA, ARPA, and other statutes and regulations. Consultations with Federally recognized tribes will be on a Government-to-Government level to respect tribal sovereignty and to recognize the unique legal relationship between the Federal Government and Indian Tribes set forth in the U.S. Constitution, treaties, statutes, and court decisions.

Consulting/Interested Parties. Those groups or individuals who have a consulting role in the Section 106 process in accordance with 36 C.F.R. Part 800.2, such as SHPOs, THPOs (for undertakings concerning tribal lands), and Native Americans. The term also includes representatives of local government; the public; and applicants for Federal assistance, permits, licenses, and other approvals.

Cultural Resources. Archaeological and Native American built resources, heritage assets, Historic Properties, NASA artifacts, and NHLs, including, but not limited to, buildings, structures, objects, districts, and sites.

Cultural Resources Professional. A person who meets qualifications in anthropology, archaeology, history, historical architecture, preservation planning, or other preservation specialties set forth in Section 112 of NHPA, Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation, and 36 C.F.R. Part 61.

Eligible Historic Properties. Those properties that meet the criteria of the NRHP and have concurrence from the SHPO/THPO regarding their eligibility to the NRHP.

Federal Preservation Officer. The Agency official that NHPA charges with coordinating the Agency CRM Program including interactions with the other agencies, states, Native Americans, National Park Service, the Advisory Council on Historic Preservation, and others.

Heritage Asset. Property, plant, or equipment that is unique for its historical or natural significance; cultural, educational, or artistic importance; and/or significant architectural characteristics. Consists of: (1) collection types, such as objects gathered and maintained for exhibition, (for example, museum collections, art collections, and library collections); or (2) non-collection-types, such as parks, memorials, monuments, and buildings. It is reported in Agency financial statements in accordance with the Federal Accounting Standards Advisory Board (FASAB), Statement of Federal Financial Accounting Standards No. 29, Heritage Assets and Stewardship Land. (Heritage assets are defined in SFFAS No. 29, Heritage Assets and Stewardship Land.) NASA's heritage assets include real properties that also are historic properties. These are reported by the Office of the Chief Financial Officer (OCFO) in NASA's annual financial report.

Historic Preservation or Preservation. Section 301(8) of NHPA, 16 U.S.C. Part 470 w(8), states that historic preservation "includes identification, evaluation, recordation, documentation, curation, acquisition, protection, management, rehabilitation, restoration, stabilization, maintenance, research, interpretation, conservation, and education and training" regarding cultural resources. The Secretary of the Interior's Standards for the Treatment of Historic Properties (NPS 1992) defines historic preservation as "the act or process of applying measures necessary to sustain the existing form, integrity, and materials of an historic property."

Historic Preservation Officer. A NASA employee who is designated by the Center Director and given the responsibility to manage cultural resources at the Center or Component Facility, if any, pursuant to NHPA, ARPA, NAGPRA, and other legal authorities.

Historic Property. Any district, site, building, structure, or object included on or eligible for inclusion in the NRHP, per the criteria provided in 36 C.F.R. Part 60.4. It also includes cultural resources defined as any prehistoric or historic district, site, building, structure, or object that is included in or eligible for inclusion in the NRHP maintained by the Secretary of the Interior and that has met the eligibility requirements in 35 C.F.R. Part 60.4. The term includes artifacts, records, and remains related to and located within such properties and includes properties of traditional religious and cultural importance to an Indian Tribe or Native Hawaiian Organization that meets the NRHP criteria. (16 U.S.C. 470 et seq.)

Indian Tribe. An Indian or Alaskan Native Tribe, band, nation, pueblo, village, or community that the Secretary of the Interior acknowledges to exist as an Indian Tribe pursuant to the Federally Recognized Indian Tribe List Act of 1994, 25 U.S.C. 479a.

Integrated Cultural Resources Management Plan. A plan that defines the policies and standard operating procedures for managing cultural resources at a NASA Center or Component Facility and is integrated into property management and other applicable Agency plans.

Listed (or Registered) Historic Property. Those properties that meet the criteria of the National Register of Historic Places (NRHP) and have formally been accepted by the National Park Service (NPS) to the NRHP.

Memorandum of Agreement. A legally binding form of agreement document, as described in 36 C.F.R. pt. 800.6, to mitigate adverse effects on historic properties.

NASA Artifacts. Unique objects that document the history of the science and technology of aeronautics and astronautics. Their significance and interest stem mainly from their relation to the following: Historic flights, programs, activities, or incidents; achievements or improvements in technology; our understanding of the universe; and important or well-known personalities. (See NPR 4310.1.)

NASA Environmental Tracking System. A set of relational databases that house environmental data across the Agency. The CRM module tracks cultural resources data and also connects to NASA's Cultural Resources Geographic Information System (CRGIS), which displays cultural resources information on NASA's public Web site and internally.

National Historic Landmark. A nationally significant historic place designated by the Secretary of the Interior because the property or site possesses exceptional value or quality in illustrating or interpreting the heritage of the United States. National Historic Landmarks (NHLs) are managed, in part, by the NPS's National Historic Landmark Program. All NHLs are considered historic properties or sites.

National Park Service. The Federal agency within the U.S. Department of the Interior tasked with

overseeing the NRHP and NHL Programs. NPS contains the offices of the Departmental Consulting Archeologist, who provides technical assistance to Federal agencies and who coordinates the Federal Archeology Program.

National Register of Historic Places. The Federal Government's official list of buildings, structures, districts, sites, and objects that are significant in American history, architecture, archaeology, engineering, or culture and are, thereby, considered for preservation. The NRHP is administered by the NPS.

Native Americans. For the purposes of this document, the term "Native Americans" refers to Eskimos, Aleuts, Alaskan Natives, Native North Americans, and Native Hawaiian Organizations, including Federally recognized tribes and Tribal Historic Preservation Officers, as appropriate.

Personal Property. Any property, except real property.

Programmatic Agreement. A legally binding document that records the terms and conditions agreed upon to mitigate the adverse effects associated with complex or phased undertakings when the full range of historic properties that may be affected are not known or in other situations specified in 36 C.F.R. Part 800.14(b).

Real Property. Land, buildings, other structures and facilities, and leasehold improvements. "Real property" also includes installed collateral equipment (i.e., building-type equipment), as defined in NPR 9250.1.

State Historic Preservation Officer. The official appointed by the Governor of each state and territory to carry out the functions defined in NHPA and to administer the State Historic Preservation Program.

Tribal Historic Preservation Officer. The official appointed by an Indian Tribe in accordance with NHPA to administer a Tribal Historic Preservation Program and assume duties and functions for tribal lands similar to those that the State Historic Preservation Officer has for state lands.

Undertaking. Any project, activity, action, or program wholly or partly funded under the direct or indirect jurisdiction of a Federal agency, including those carried out by or on behalf of a Federal agency; those carried out with Federal financial assistance; and those requiring a permit, license, or approval.

Appendix B. Acronyms

ACHP	Advisory Council on Historic Preservation
ARPA	Archaeological Resources Protection Act of 1979
CEQ	Council on Environmental Quality
C.F.R.	Code of Federal Regulations
CoF	Construction of Facilities
CRGIS	Cultural Resources Geographic Information System
CRM	Cultural Resources Management
EFR	Environmental Functional Review
EMD	Environmental Management Division
Exec. Order No.	Executive Order
FASAB	Federal Accounting Standards Advisory Board
FPO	Federal Preservation Officer
Fed. Reg.	Federal Register
HPO	Historic Preservation Officer
ICRMP	Integrated Cultural Resources Management Plan
JPL	Jet Propulsion Laboratory
MOA	Memorandum of Agreement
NAC	Native American Consultation
NAGPRA	Native American Graves Protection and Repatriation Act of 1990
NASA	National Aeronautics and Space Administration
NEPA	National Environmental Policy Act of 1970
NETS	NASA Environmental Tracking System
NHL	National Historic Landmark
NHPA	National Historic Preservation Act of 1966
NID	NASA Interim Directive
NPD	NASA Policy Directive
NPR	NASA Procedural Requirements
NPS	National Park Service
NRHP	National Register of Historic Places
OCFO	Office of the Chief Financial Officer
OSI	Office of Strategic Infrastructure

PA	Programmatic Agreement
SFFAS	Statement of Federal Financial Accounting Standards
SHPO	State Historic Preservation Officer
SOP	Standard Operating Procedure
SPO	Senior Policy Official
THPO	Tribal Historic Preservation Officer
U.S.	United States
U.S.C.	United States Code

Appendix F: Worker Environmental Awareness Training

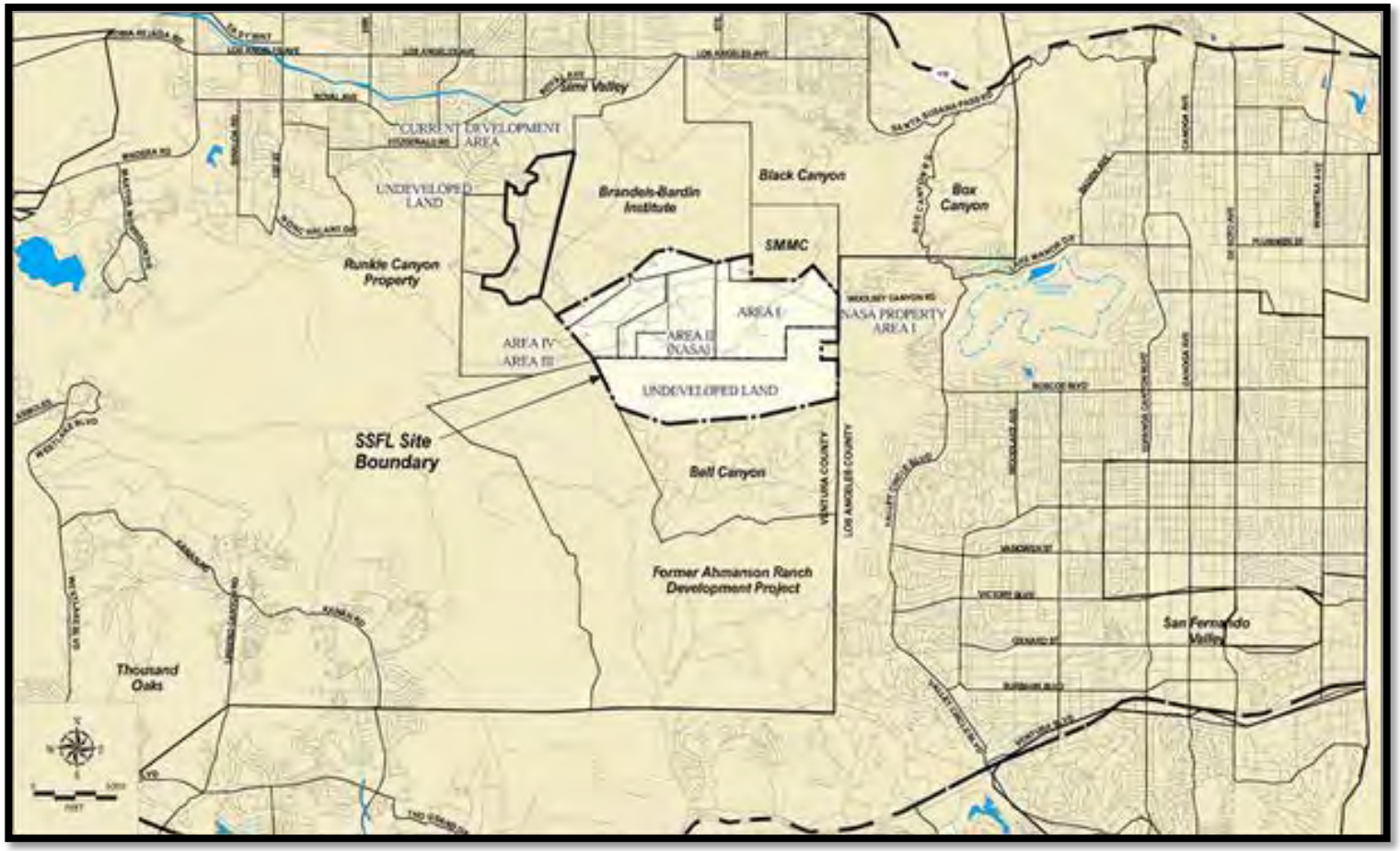
Worker Environmental Awareness Training for Cultural Resources

Santa Susana Field Laboratory, Canoga Park California

November 30, 2016

Santa Susana Field Laboratory

NASA-administered property as SSFL is owned by the U.S. Federal Government and consists of 451 acres in Areas I and II. Portions of NASA-administered property contain significant cultural resources.



What are cultural resources?

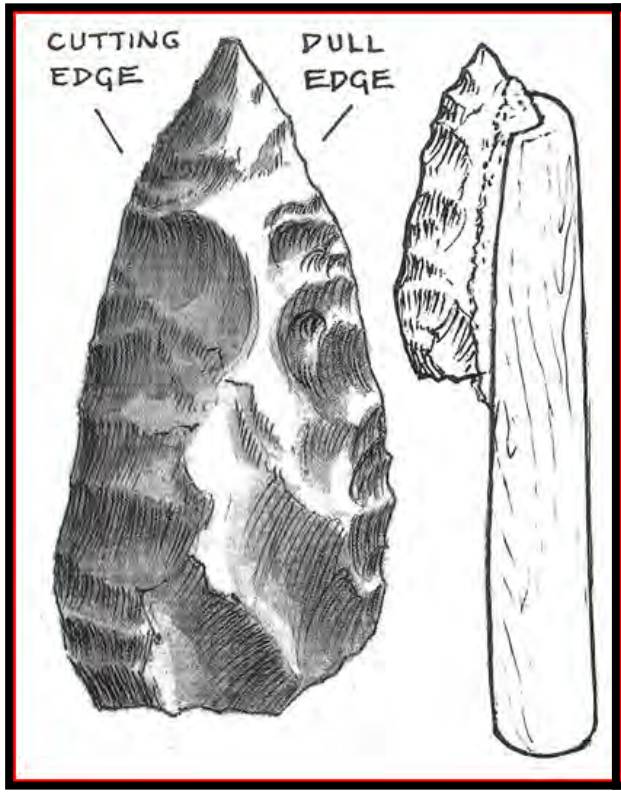
- Any trace of past human activity greater than 50 years old may be an important cultural resource.
- Places or sites where traces occur are part of a proud heritage that belongs to all of us.
- Archaeological and historical sites are a nonrenewable resource, once destroyed cannot be recreated. Archaeological sites are often so fragmentary it is possible to scrape, dig, or bulldoze through a buried site without realizing it.
- Significant cultural resources represent historical events, engineering achievements, and art or architectural styles that defined what Americans had experienced.
- Ethnographic resources are also cultural resources and include traditional plant gathering areas, shrines, ceremonial areas, cemeteries, natural landscape features, and ethnic structures or districts.

Examples of cultural resources

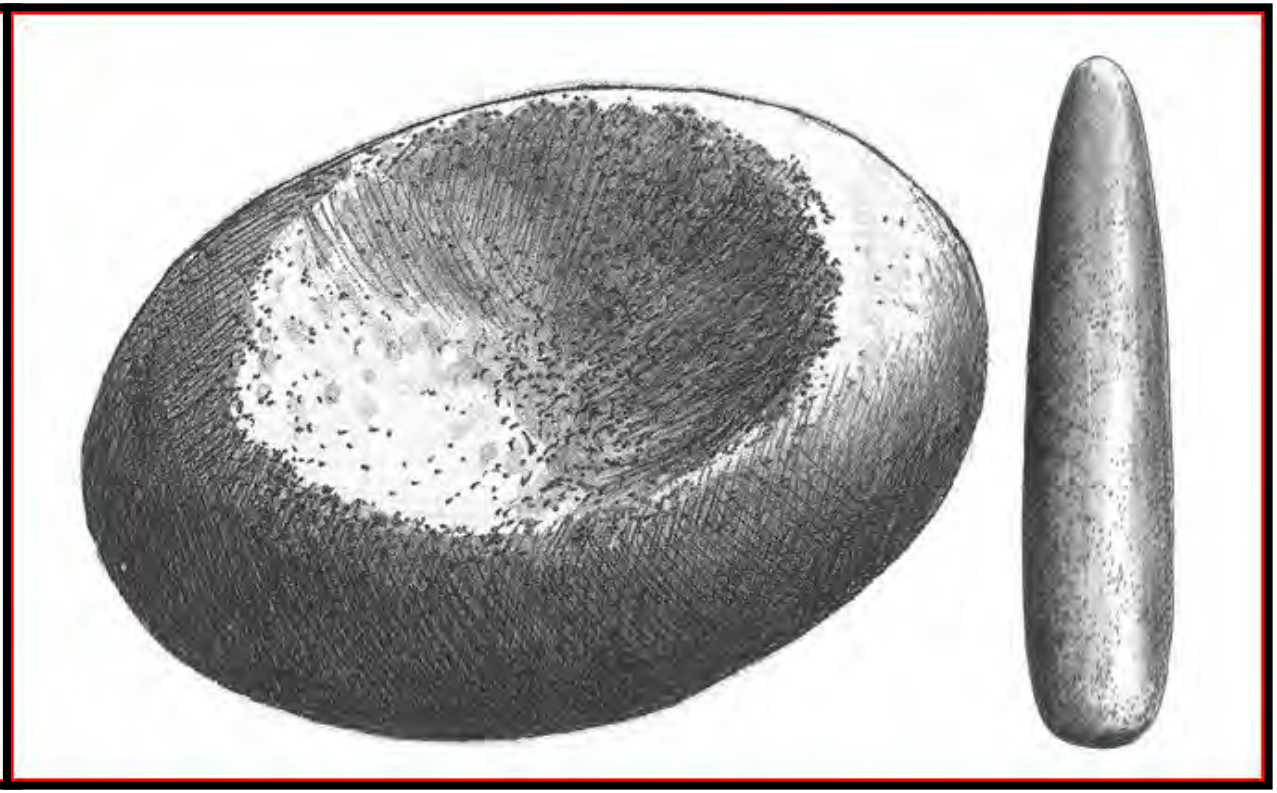
Bottles

Chert Flakes

Examples of cultural resources



flaked knives



mortar and pestle

Examples of cultural resources

Examples of cultural resources

State and Federal Laws

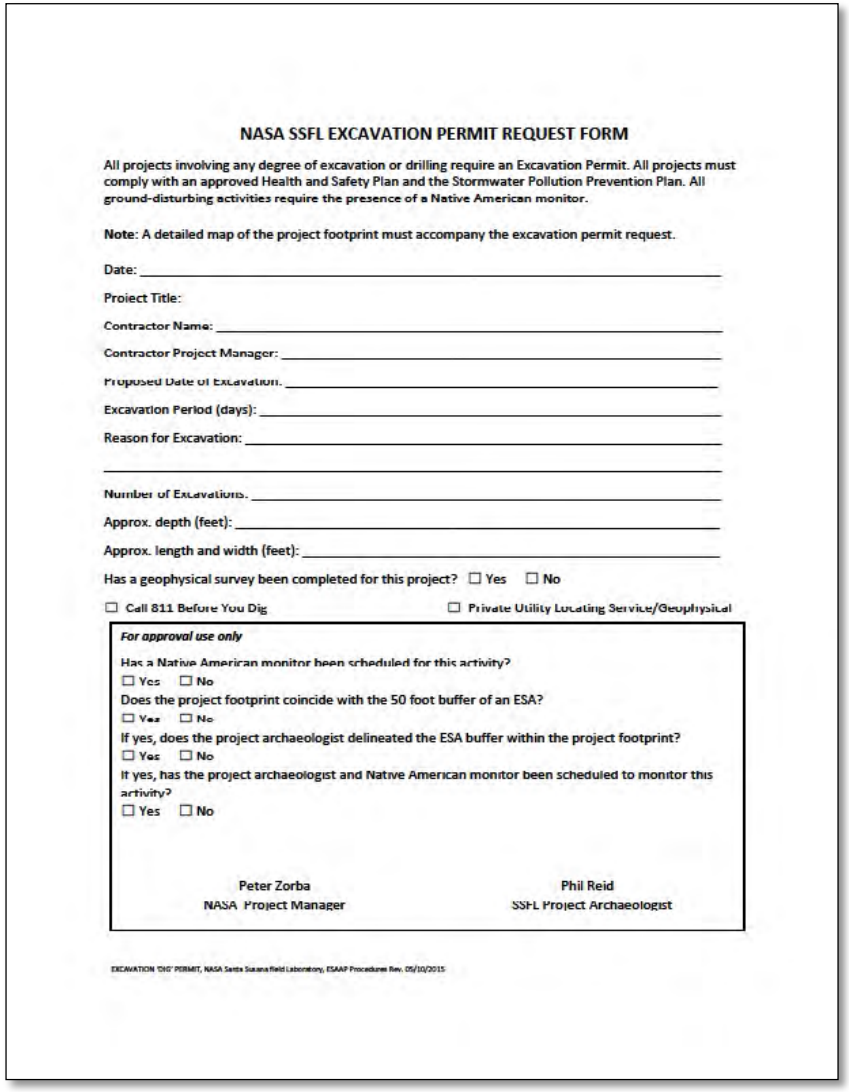
The following state and federal laws and regulations affect the management of cultural resources at SSFL:

- National Historic Preservation Act
- National Environmental Policy Act
- Archeological and Historic Preservation Act
- Archeological Resource Protection Act
- Native American Graves Protection and Repatriation Act
- California Public Resources Code

There is also a 2014 Programmatic Agreement (PA) containing stipulations that NASA must follow during remediation and demolition activities.

Environmentally Sensitive Area Action Plan ESAAP

- The ESSAP allows NASA to manage cultural and resources in compliance with its Programmatic Agreement (PA) as well as federal, state and local law.
- The ESSAP stipulates that two weeks prior to any ground disturbing activity, an excavation permit must be obtained from NASA for ground disturbing activities.
- This allows NASA to have the necessary personnel onsite and protect culturally sensitive areas in order to facilitate your work.



NASA SSFL EXCAVATION PERMIT REQUEST FORM

All projects involving any degree of excavation or drilling require an Excavation Permit. All projects must comply with an approved Health and Safety Plan and the Stormwater Pollution Prevention Plan. All ground-disturbing activities require the presence of a Native American monitor.

Note: A detailed map of the project footprint must accompany the excavation permit request.

Date: _____

Project Title:

Contractor Name: _____

Contractor Project Manager: _____

Proposed Date of Excavation: _____

Excavation Period (days): _____

Reason for Excavation: _____

_____

Number of Excavations: _____

Approx. depth (feet): _____

Approx. length and width (feet): _____

Has a geophysical survey been completed for this project? ☐ Yes ☐ No

☐ Call 811 Before You Dig ☐ Private Utility Locating Service/Geophysical

For approval use only

Has a Native American monitor been scheduled for this activity?
☐ Yes ☐ No

Does the project footprint coincide with the 50 foot buffer of an ESA?
☐ Yes ☐ No

If yes, does the project archaeologist delineated the ESA buffer within the project footprint?
☐ Yes ☐ No

If yes, has the project archaeologist and Native American monitor been scheduled to monitor this activity?
☐ Yes ☐ No

Peter Zorba
NASA Project Manager

Phil Reid
SSFL Project Archaeologist

EXCAVATION "DIG" PERMIT, NASA Santa Susana Field Laboratory, ESAAP Procedures Rev. 05/10/2015

Environmentally Sensitive Area Action Plan ESAAP

Information required for an excavation permit includes:

- Name of contractor.
- Name of project manager and/or field supervisor.
- Detailed map of the areas that will be impacted.
- Description of the work to be performed, including duration, depth, and excavation method.

Excavation cannot commence until the NASA onsite manager and the project archaeologist have signed off on the excavation permit.

On-site Monitoring

There will be an archaeological monitor and a Native American monitor onsite during all ground-disturbance activities including:

- Earth-moving
- Clearing
- Grading
- Drilling
- Sampling
- Demolition

The Native American monitor is on site to observe work taking place at SSFL and assure the Native American community that it is being conducted according to the law and the wishes of their people.

It is the archaeological monitor's job to evaluate cultural resources discovered during construction activities, and to stop work if any important cultural resources are discovered. The archaeological and Native American monitors will observe all work involving undisturbed soils in areas where buried cultural resources may exist.

Cultural Resource Discovery

If an archaeological monitor and/or Native American monitor is present when a cultural resource is exposed:

- The monitor will direct you to stop work at the location of the “find.”
- Archaeological monitors have the authority to halt construction activity in the area of a find to an extent sufficient to ensure that the resource is protected from further impacts.
- Stopping construction activities in the vicinity of an archaeological find is NASA’s obligation in complying with the PA and one which you must comply with.
- Work may be stopped or redirected for only a few minutes, or it may be shut down in that area for an extended time, depending on what is found. This may range from a day for isolated artifacts to up to a month if human remains are discovered.

Cultural Resource Discovery

If an archaeological monitor and/or Native American monitor is not present when a cultural resource is found:

- **STOP WORK** and notify your supervisor and/or CH2MHILL's Project Manager. Mark the location of the find and block off access to it until cultural resources personnel arrive.
- Work will not continue until it's determined how to redirect the halted work. You can use readily available materials such as barrier fencing, barrier tape, or traffic cones to ensure that workers and equipment do not enter the area.
- The area of the find must be protected from potential damage from construction activities.

What to Look For

- Discolored soils with a “greasy” feel to it, in an area of lighter colored soils

- A thin layer or series of layers of charcoal or ash in an excavation side wall

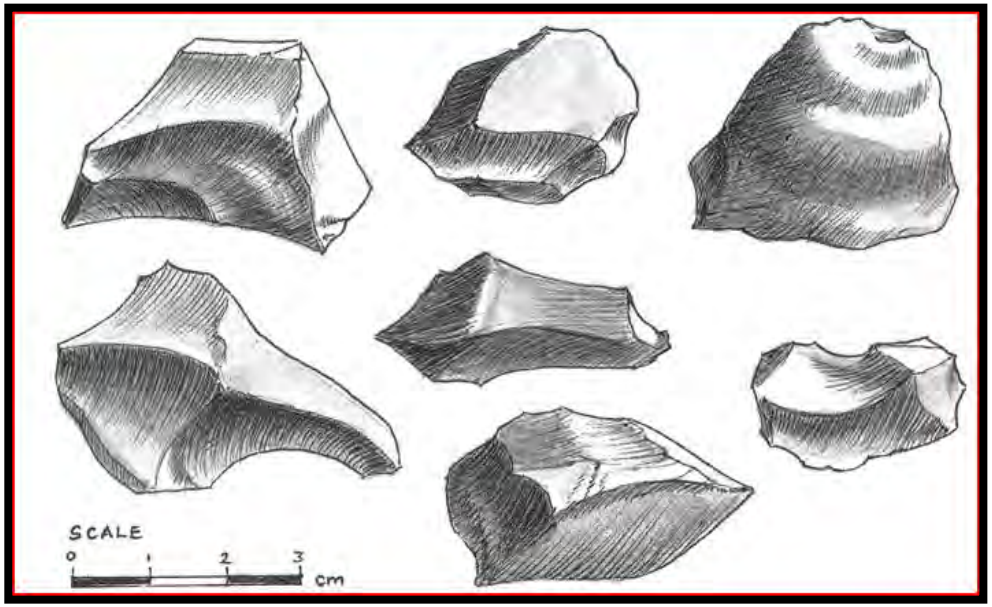
What to Look For

- Shell, freshwater or marine, or shell artifacts

- Pottery fragments

What to Look For

- Any unusual concentration of rocks
- A concentration of small pieces of broken rock, particularly obsidian, quartzite or chert with sharp edges (flakes)
- A concentration of brick or concrete, or mortared stone that might indicate a structural foundation
- Any animal or human bone



Unauthorized Collection

- Removing artifacts without a permit is a violation of state and federal law.
- You shall not disturb, collect, or move a cultural resource.
- Violating these regulations can result in federal indictment, and are punishable by civil and criminal penalties.
- Penalties could include fines and/or imprisonment, and might result in the project itself being shut down at the direction of a state or federal agency.
- Disturbing Native American burial sites is a felony under *California Public Resources Code Section 5097.99* as well as NAGPRA.

Contact Information

NASA Cultural Resource Manager

Melvin Mckinstry

(256) 544-9595

Project Manager

CH2MHILL Onsite

Randy Dean

(805) 907-6432

- **NASA SSFL**
- **Program Director**

Peter Zorba

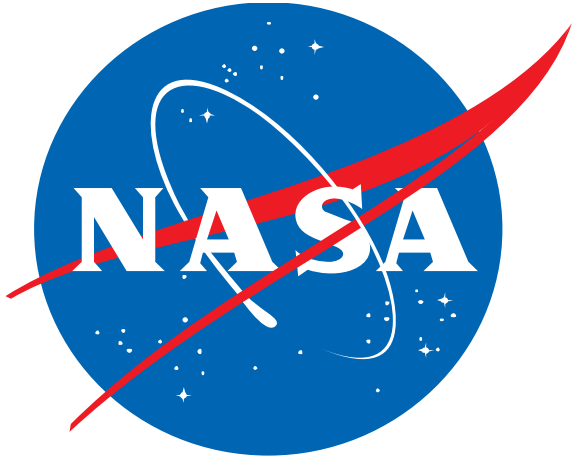
(202) 714-0496

Project Archaeologist

CH2MHILL

Phillip Reid

(510) 673-0909


NASA

Appendix G: Environmentally Sensitive Areas Action Plan

Environmentally Sensitive Area Action Plan for Santa Susana Field Laboratory Ventura County, California

Prepared for

National Aeronautics and Space Administration
Marshall Space Flight Center,
Huntsville, AL

November 2016

Contents

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Environmentally Sensitive Area Action Plan

1.1 Summary

This Environmentally Sensitive Area Action Plan (ESAAP) has been prepared to guide the planning and execution of specific elements of cleanup and remediation with potential for ground disturbance within archeological sites at the Santa Susana Field Laboratory (SSFL) in Ventura County, California. This plan has been prepared in fulfillment of Stipulation III.C of the National Aeronautics and Space Administration's (NASA's) Section 106 Programmatic Agreement (PA; NASA, 2014) as part of compliance with Sections 106 and 110 of the National Historic Preservation Act.

A recent pedestrian survey of the SSFL property resulted in the recording of 41 new archeological sites and the re-recording of 3 known archeological sites at SSFL. Of the 44 known sites on the SSFL property, 7 occur within final remediation areas (FRAs).

Environmentally sensitive areas (ESAs) will be created around archeological sites and other historic properties where project activities have the potential for ground disturbance within 50 feet. ESAs may be expanded or collapsed based on data from future testing programs or inadvertent discoveries. Projects with potential for ground disturbance within 50 feet of or within an ESA will be monitored by a qualified archeologist. A Native American monitor will also be invited to participate.

ESAs will be delineated using plastic fencing, construction tape, or surveyors line if necessary. A training module for worker environmental awareness training (WEAT) focusing on cultural resource issues has been developed for all project personnel. The NASA onsite project manager, SSFL onsite project manager, and the SSFL project archeologist will be responsible for coordinating, planning, and executing this ESAAP.

1.2 Introduction

This ESAAP describes the archeological sites and other historic properties to be protected, outlines required protective measures, identifies responsible parties and their roles, and presents the process for any demolition, toxic substances cleanup, and soil remediation activities at SSFL with the potential for ground disturbance.

Cleanup and remediation activities at SSFL are being carried out in preparation for the transfer of ownership of SSFL from NASA to the General Services Administration, which will prepare the property for deaccession from federal ownership. The Section 106 consultation resulted in measures to avoid, minimize, or mitigate adverse effects on historic properties, which were codified in the 2014 SSFL PA. Cleanup and remediation activities may include the demolition of most or all of the standing structures, as well as the remediation or removal of contaminated soil from SSFL.

SSFL occupies 2,850 acres (1,153 hectares) and is approximately 29 miles northwest of Los Angeles, California, in the Santa Susana Mountain Range. The site sits near the crest of the Simi Hills between the Simi and San Fernando Valleys in southeastern Ventura County. The property is bounded by Canoga Park in Los Angeles County to the east, Bell Canyon to the south, the Brandeis-Barden Institute to the north, and Meier and Runkle Canyons to the northwest. The site is divided into four areas (Areas I to IV) and an undeveloped area. Areas I, III, IV, and the undeveloped area are owned by The Boeing Company (Boeing). NASA administers 409 acres (165 hectares) designated as Area II and a 42-acre (17-hectare) portion of Area I (Figure 1).

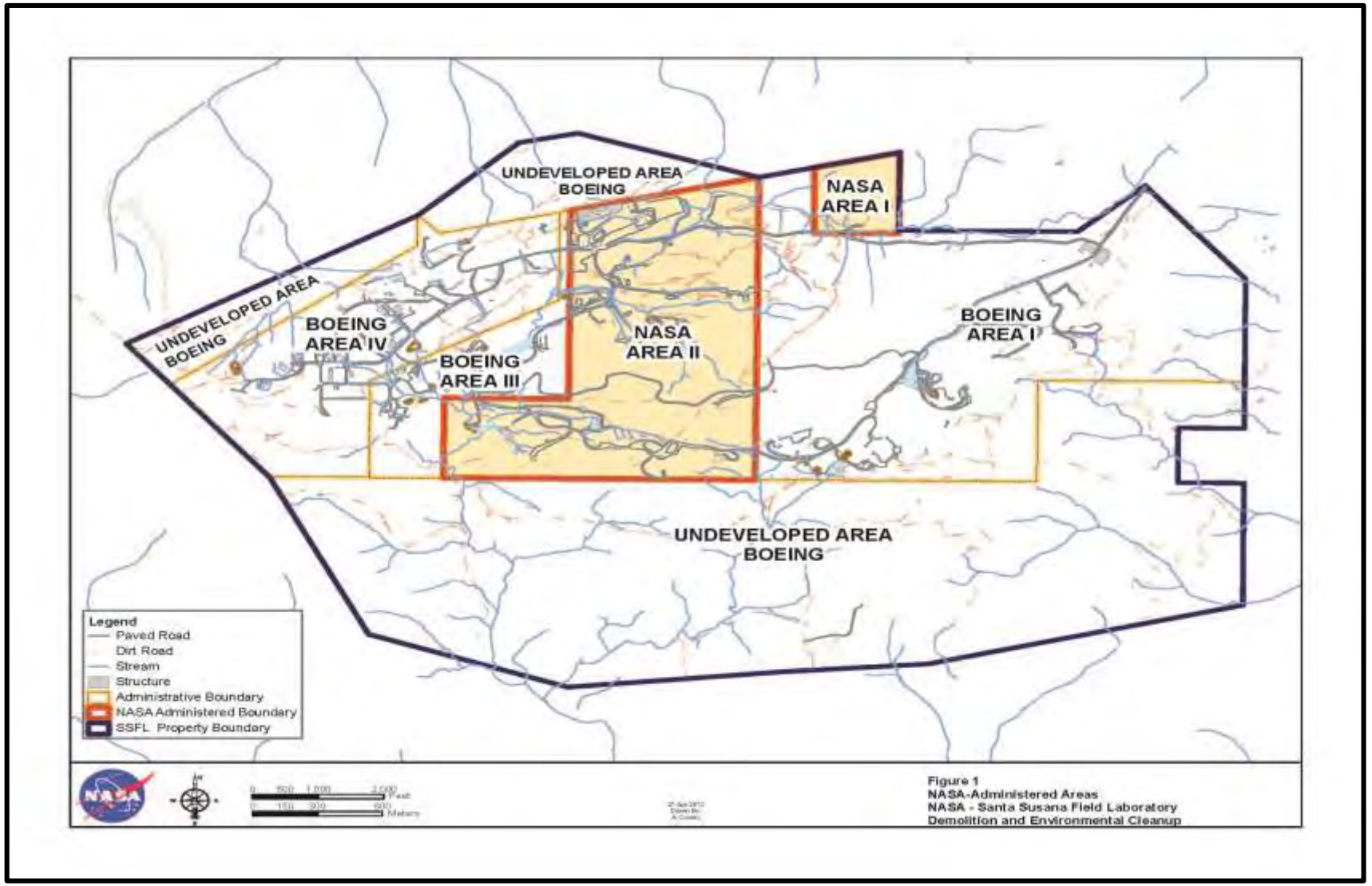

FIGURE 1
Map of Santa Susana Field Laboratory

1.3 Project Description

NASA will be remediating the environment to a level that meets NASA's environmental cleanup responsibilities and will undertake the demolition actions necessary to support both remediation and property disposition of the NASA-administered portion of SSFL. NASA has declared the property excess to its mission needs. The PA establishes a process for consultation, review, and compliance during the remediation process. Remediation actions may include the demolition of existing buildings and structures, environmental testing, and the cleanup of soil and groundwater.

The structures that will be demolished or dismantled as a part of the remediation include some or all of the test stands, as well as ancillary structures, which have been used since the 1950s for rocket engine testing in the Alfa, Bravo, and Coca Test Areas. These will include the following:

- Aboveground and subsurface structures
- Building foundations
- Utility poles
- Piping
- Administrative and operations buildings
- Water tanks
- Aboveground and below ground storage tanks
- Observation lookouts, roadways, and drainage ways

Demolition will include the removal of soil under the structures up to 5 feet (1.5 meters) below existing grade. Demolition of structures in Area II is estimated to take from 18 to 24 months to complete. Heavy equipment could include excavators, crawler cranes, all-terrain cranes, people-lifts, wheel loaders, 40-ton off-highway trucks, bulldozers, vacuum trucks, motor graders, and skid steer loaders.

Soil remediation will include the excavation, transportation, and disposal of contaminated surface and subsurface soil. Excavation also might be used as a backup approach to other technologies tried first in an attempt to avoid environmental impacts, if the other technology did not achieve cleanup to background levels. The soil would be excavated to bedrock in some areas where the top of bedrock is shallow. Bedrock would not be excavated. Rock outcrops generally would be retained. The estimated volume of soil requiring excavation under the proposed action would be approximately 500,000 cubic yards.

Groundwater remediation may include the drilling of test and/or production wells to varying depths. It is also expected to consist of the operations of a groundwater extraction and treatment system and possible operations of other treatment technologies such as vapor extraction systems or in situ processes. Any of these systems may be required to operate for a number of years.

1.4 Regulatory Context

1.4.1 National Historic Preservation Act and 2014 Programmatic Agreement

NASA initiated National Historic Preservation Act Section 106 consultation with the California State Historic Preservation Office (SHPO) and the Advisory Council on Historic Preservation (ACHP) on June 30, 2011, for demolition and remediation activities in preparation for transfer of ownership of SSFL from NASA to the General Services Administration. The Section 106 consultation resulted in measures to avoid, minimize, or mitigate adverse effects on historic properties as described in the 2014 SSFL PA. The PA that NASA entered into with the California SHPO and the ACHP seeks to address the adverse effect on historic properties from the demolition and remediation activities on NASA-administered property at SSFL.

1.5 Environmentally Sensitive Areas Action Plan and Methodology

In April 2014, NASA entered into a PA with the California SHPO and the ACHP to codify the appropriate measures to mitigate the adverse effects from the remediation of NASA property at SSFL (Appendix A). The PA stipulates actions that must be taken during, prior to, and after the undertaking to address the adverse effects on historic properties from the cleanup and remediation activities. Stipulation III.C states that NASA will develop an ESAAP to delineate the areas to be protected, document the required protective measures, identify responsible parties and their roles, and outline a schedule and process for implementing the plan.

For the purposes of this plan, an ESA delineates the horizontal boundary of an archeological site or historic property that requires active protection during project ground-disturbing activities at SSFL. The establishment and enforcement of ESAs are carried out under the requirements of the Section 106 SSFL PA Stipulation III.C (NASA, 2014). Cultural resource ESAs may include built environment resources (buildings and foundations) and prehistoric resources such as rock art, lithic scatters, and habitation areas (middens). Prior to any project that has the potential for ground-disturbing activity, a work plan describing the activity and a map must be submitted to the onsite archeologist, and after review, an excavation permit will be issued. A copy of an excavation permit in included in Attachment A.

1.6 Identified Environmentally Sensitive Areas

NASA's holdings at the SSFL (Area II and Area I Liquid Oxygen [LOX]) contain a total of 44 known cultural resources. One of these, the Burro Flats site (CA-VEN-1072) is on the National Register of Historic Places (NHRP). The remaining 43 sites are generally described as being either rock shelters with associated midden or open air lithic scatters. For the purposes of the demolition or remediation activities, the cultural resources are being treated as eligible for the NRHP.

1.7 ESAAP Process

1.7.1 Work Plan

Work at NASA-administered Areas of SSFL is carried out at the request of NASA. Work plans will be submitted to NASA's onsite project manager, as well as the SSFL onsite project manager.

The work plan must include the following:

1. Detailed map of the areas that will be impacted.
2. Description of the work to be performed, including depth and methods of ground disturbance.

After the work plan has been submitted to NASA's onsite project manager and the SSFL onsite project manager, it will be evaluated as part of the project planning process. Any project with the potential for ground disturbance will be mapped in relation to known archeological sites. If the project's ground-disturbing activity is planned within 100 feet of the boundaries of a known archeological site or other historic property, an ESA will be established around the site(s).

Prior to initiating ground-disturbing activities, the project archeologist will establish the boundaries of the ESAs in the field. ESAs will be delineated with plastic fencing, construction tape, or surveyors line depending on the site in question and the nature and duration of the work planned. Once the ESA has been delineated, work may begin only with the presence of an archeologist and a Native American monitor.

1.7.2 Monitors

Projects with the potential for ground disturbance within 100 feet of an ESA will be monitored by a qualified archeologist and a Native American monitor. Archeological monitoring will be carried out by individuals who meet the U.S. Secretary of the Interior's Professional Qualifications Standards for archeology and will likely

require Occupational Safety and Health Administration (OSHA) 40-hour Hazardous Waste Operations and Emergency Response Standard (HAZWOPER) training.

An archeological monitor will be required when demolition or remediation activities will take place within 100 feet of a known archeological site. All ground-disturbing work carried out at NASA-administered Areas of SSFL will include a Native American monitor, so far as relevant tribes are willing and able to provide them. Native American monitors must be of local (SSFL) decent and have Chumash and Tataviam tribal, cultural, as well as archeological experience in Los Angeles or Ventura counties. Native American monitors may need to be OSHA 40-hour HAZWOPER-certified.

1.7.3 Responsible Parties

Cultural resources at the NASA-administered Areas of SSFL are the responsibility of NASA's SSFL cultural resources manager (CRM) as described in the SSFL Integrated Cultural Resource Management Plan. During demolition and remediation activities at the NASA-administered Areas of SSFL, the implementation of the PA, Integrated Cultural Resource Management Plan, and ESAAP will be the responsibility of NASA's onsite project manager, the SSFL onsite project manager, and the project archeologist in consultation with NASA's SSFL CRM. A matrix of parties and their responsibilities is provided in Table 1.

TABLE 1
Responsibilities Matrix
Environmentally Sensitive Area Action Plan, SSFL, Ventura County, California

Stage	Responsible Parties	Task
Pre-remediation	SSFL Project Archeologist SSFL Onsite Project Manager	Will ensure that all onsite personnel have taken the SSFL Worker Environmental Awareness Training (WEAT) program prior to the start of any demolition or remediation activity.
	SSFL Project Archeologist SSFL Onsite Project Manager NASA Onsite Project Manager	Prior to any ground-disturbing activity, project plans for that activity will be submitted to the NASA project manager and the SSFL project manager. The project footprint for the activity will be compared to a map of ESAs to evaluate areas for archeological sensitivity.
	SSFL Project Archeologist SSFL Onsite Project Manager	The SSFL project manager will notify the project archeologist at least 1 week in advance of the commencement of any ground-disturbing activities within an ESA to ensure that an archeologist will be available to monitor boundary or fencing installation and allow for field review of ESA locations. The SSFL onsite project manager will retain a Native American monitor for this activity.
	SSFL Project Archeologist SSFL Onsite Project Manager	The project archeologist will perform a field review of ESA locations at least 2 days prior to demolition or remediation activities.
During remediation	SSFL Project Archeologist SSFL Onsite Project Manager NASA Onsite Project Manager	The project archeologist or the contractor, under supervision of the project archeologist will install temporary plastic fencing or other boundary around archeologically sensitive areas. The fencing will be installed at least one calendar week prior to initiating any work near those areas (see attached map). The project archeologist will coordinate this activity with the onsite project manager and be present to supervise and monitor fence or boundary installation. The SSFL onsite project manager will retain a Native American monitor for all ground-disturbing activities, including fencing installation.
	SSFL Project Archeologist SSFL Onsite Project Manager	Project archeologist will be present to monitor all remediation or demolition activities within an ESA.

TABLE 1
Responsibilities Matrix
Environmentally Sensitive Area Action Plan, SSFL, Ventura County, California

Stage	Responsible Parties	Task
Post-remediation	Contractor SSFL Project Archeologist SSFL Onsite Project Manager	The project archeologist or the contractor, under supervision of the project archeologist, will remove temporary boundary or fencing at the conclusion of remediation. A Native American monitor will also be required for this activity.

Notes:
NASA Onsite Project Manager: Pete Zorba (202) 714-0496
SSFL Onsite Project Manager: Randy Dean (805) 907-6432
SSFL Project Archeologist: Phil Reid (510) 673-0909

1.8 Inadvertent Discoveries and Human Remains

Archeological deposits that are newly discovered during any undertaking will be evaluated for their NRHP eligibility. Until NASA has determined an archeological site is ineligible for listing in the NRHP, all known sites will be treated as potentially eligible and will be avoided insofar as is possible. In the event that an archeological deposit is inadvertently discovered, work must cease within a 30-meter radius, the CRM and the SHPO must be notified within 2 working days (for example, letter or email notification), and a professional archeologist (meeting the Secretary of Interior's Professional Qualifications) must be consulted. If the professional archeologist recommends that the archeological deposit is potentially eligible, the CRM will consult with the California SHPO and federally recognized Native American tribes on the need for further testing and/or data recovery for those sites eligible under Criterion D. If the undertaking may affect properties having historic value to any federally recognized Indian tribes with which NASA consults, the CRM will consult with the tribes and give them an opportunity to participate as interested persons during the consultation process.

In the event that human remains are inadvertently discovered, work must cease in the area of the discovery and the CRM must be notified. SSFL Law Enforcement/Center Protective Services officers will notify the Ventura County Coroner within 48 hours; the State Health and Safety Code Section 7050.5 states that no further disturbance will occur until the County Coroner has made a determination of origin and disposition pursuant to Public Resources Code Section 5097.98.

1.9 References

Corbett, Ray, et al. 2015. *Phase I Archaeological Survey, Santa Susana Field Laboratory Area II And Lox Area I, Ventura County, California.* John Minch and Associates, Inc. Mission Viejo, California.

National Aeronautics and Space Administration (NASA). 2014. *Programmatic Agreement among National Aeronautics and Space Administration, The California State Historic Preservation Officer, and the Advisory Council on Historic Preservation Regarding Demolition, Groundwater and Soils Cleanup. Santa Susana Field Laboratory, NASA Areas I and II, Ventura County, California*.

National Aeronautics and Space Administration (NASA). 2015. *Worker Environmental Awareness Training Program*. Prepared for National Aeronautics and Space Administration, Marshall Space Flight Center, Huntsville, Alabama.

Attachment A
Excavation Permit

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NASA SSFL EXCAVATION PERMIT REQUEST FORM

All projects involving any degree of excavation or drilling require an Excavation Permit. All projects must comply with an approved Health and Safety Plan and the Stormwater Pollution Prevention Plan. All ground-disturbing activities require the presence of a Native American monitor.

Note: A detailed map of the project footprint must accompany the excavation permit request.

Date: _____
Project Title: _____
Contractor Name: _____
Contractor Project Manager: _____
Proposed Date of Excavation: _____
Excavation Period (days): _____
Reason for Excavation: _____
_____
Number of Excavations: _____
Approx. depth (feet): _____
Approx. length and width (feet): _____
Has a geophysical survey been completed for this project? ☐ Yes ☐ No
☐ Call 811 Before You Dig ☐ Private Utility Locating Service/Geophysical

For approval use only

Has a Native American monitor been scheduled for this activity?
☐ Yes ☐ No

Does the project footprint coincide with the 50 foot buffer of an ESA?
☐ Yes ☐ No

If yes, does the project archeologist delineated the ESA buffer within the project footprint?
☐ Yes ☐ No

If yes, has the project archeologist and Native American monitor been scheduled to monitor this activity?
☐ Yes ☐ No

_____	_____
Peter Zorba	Phil Reid
NASA Project Manager	SSFL Project Archeologist