

**Final**

**ENVIRONMENTAL ASSESSMENT  
DECONSTRUCTION AND TRANSFER OF LOW-TURBULENCE PRESSURE  
TUNNEL COMPLEX FACILITIES  
AT NASA LANGLEY RESEARCH CENTER, HAMPTON, VIRGINIA**

**Lead Agency:** National Aeronautics and Space Administration (NASA), Langley Research Center (LaRC), Hampton, Virginia

**Proposed Action:** Deconstruction and Transfer of Low-Turbulence Pressure Tunnel Complex Facilities at NASA LaRC

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**Abstract:** NASA is proposing the deconstruction of four buildings and the transfer to Langley Air Force Base (LAFB) of one building associated with the Low-Turbulence Pressure Tunnel Complex at Langley Research Center (LaRC), located in Hampton, Virginia. All of the buildings are located on land leased by NASA from LAFB. The buildings are closed and NASA has determined they are no longer needed. The proposed action is intended to reduce the Center's infrastructure and allow LaRC to direct limited resources towards facilities that support NASA's overall mission, both currently and in the future. The deconstruction and transfer activities would begin in 2010 and continue into 2012. Following removal of the facilities, NASA LaRC would return the land to LAFB. This Environmental Assessment (EA) evaluates the environmental impacts of the Proposed Action, one Alternative to deconstruct all five of the buildings, and the No-Action Alternative.

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## 1.0 PURPOSE AND NEED FOR THE PROPOSED ACTION

### 1.1 INTRODUCTION

This Environmental Assessment (EA) has been prepared to analyze the potential environmental impacts associated with NASA's proposed deconstruction and transfer of buildings associated with the Low-Turbulence Pressure Tunnel Complex (LTPT) at NASA Langley Research Center (LaRC), located in Hampton, Virginia.

This EA was prepared in accordance with the requirements of the National Environmental Policy Act of 1969 (NEPA), as amended (42 United States Code 4321 et seq.), the Council on Environmental Quality (CEQ) Regulations for Implementing the Procedural Provisions of NEPA (40 Code of Federal Regulations (CFR) Parts 1500–1508), NASA's regulations (14 CFR Part 1216 Subpart 1216.3), and NASA Procedural Requirements (NPR) 8580.1, "Implementing the National Environmental Policy Act and Executive Order 12114." Information contained in this EA will be used by NASA and the appropriate regulatory agencies to facilitate the NEPA decision-making process and to determine if the Proposed Action would significantly affect the quality of the natural or human environment. If implementing the Proposed Action is determined to have significant environmental impacts, an Environmental Impact Statement may be prepared. If the implementation of the Proposed Action is determined not to be significant, the NEPA decision-making process would conclude with a Finding of No Significant Impact (FONSI).

Chapter 1 of this EA includes background information, and the purpose and need for the Proposed Action. Chapter 2 includes a description of the Proposed Action, one Alternative, the No-Action alternative, and a description of alternatives considered but not carried forward in the EA. Chapter 3 describes the existing conditions of various environmental resources in the area of the Proposed Action, and Chapter 4 describes how those resources would be affected by implementation of the Proposed Action, the one Alternative and the No-Action alternative. Chapter 5 addresses the cumulative effects of other past, present, and reasonably foreseeable actions that may be implemented in the area of the Proposed Action. Appendix A includes the list of agencies and outside organizations contacted by NASA LaRC regarding the project, as well as any responses received, and Appendix B includes photographs of the LTPT Complex.

NASA requires that numeric calculations and figures be presented in metric units with the British equivalent provided in parenthesis.

### 1.2 PROJECT LOCATION

NASA LaRC is situated near the southern end of the lower Virginia Peninsula, approximately 241 kilometers (km) (150 miles) south of Washington, D.C. and 80 km (50 miles) southeast of Richmond, Virginia. LaRC is located within close proximity to several surface water bodies within the tidal zone of the Chesapeake Bay. The cities of Hampton, Poquoson, Newport News, and York County form a major metropolitan statistical area around LaRC. The Center is comprised of research facilities located in two areas which are approximately 4.8 km (3 miles) apart. The two areas, commonly called the West Area and the East Area, are divided by the runways of Langley Air Force Base (LAFB), the headquarters of the Air Combat Command.

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The East Area is located on 8 hectares (20 acres) of land leased by NASA from LAFB. This area is the original 1917 portion of LaRC and contains several wind tunnels, research facilities, and administrative offices. The West Area occupies 318 hectares (788 acres) of land and contains the major portion of LaRC with the majority of the facilities located there. Figure 1.1 shows LaRC's regional location and relation to LAFB.

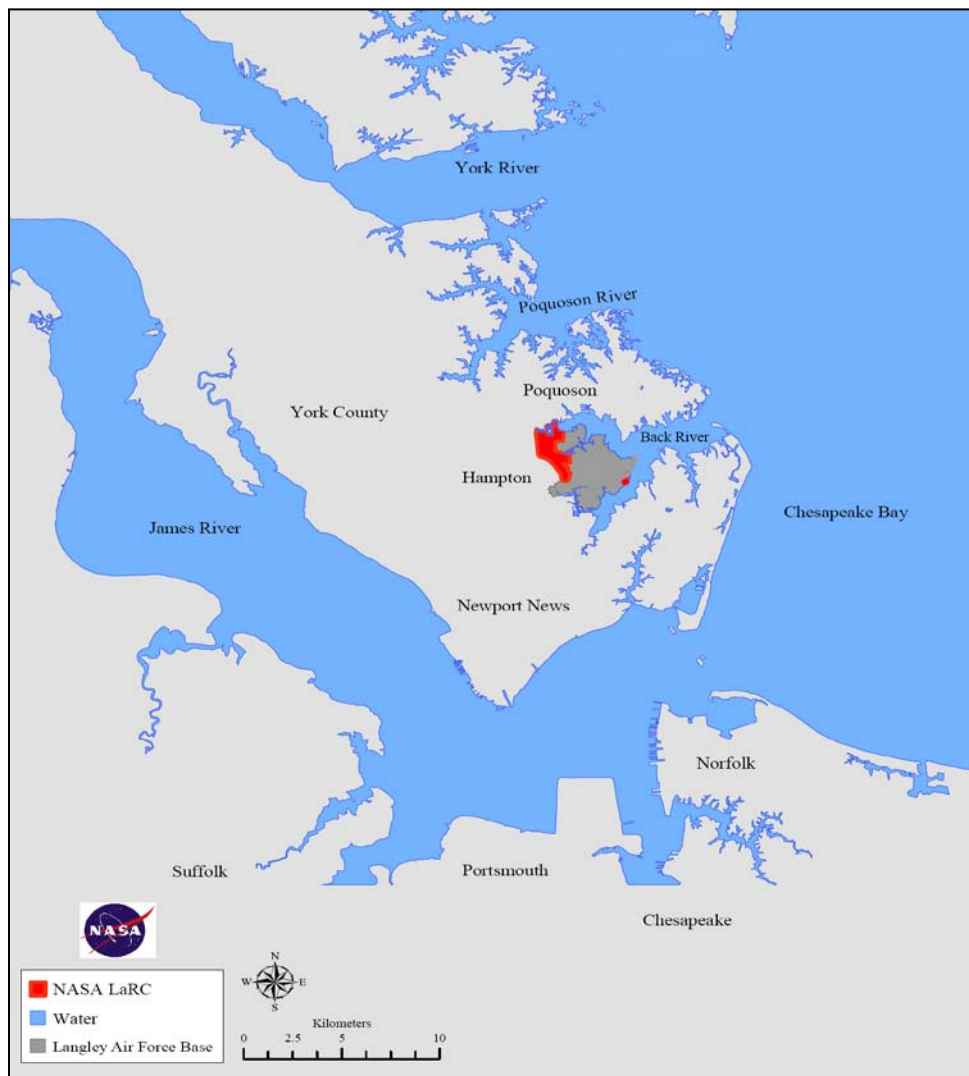


Figure 1.1 – Location of NASA Langley Research Center

### 1.3 BACKGROUND

In 1917, the War Department purchased land in what is now Hampton, Virginia, for joint use by the Army and the National Advisory Committee for Aeronautics (NACA), the forerunner organization for NASA. The site was designated the Langley Field after Professor Samuel

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Pierpont Langley, an early pioneer in flight. Congress had created NACA to “supervise and direct the scientific study of the problems of flight” and the Langley Field served as an experimental airfield and proving ground for aircraft. The facility was renamed Langley Memorial Aeronautical Laboratory in 1920 with the dedication of the first wind tunnel. As the organization grew, NACA concentrated mainly on laboratory studies at Langley, gradually shifting from aerodynamic research to military rocketry. As the Cold War brought an increasing priority to missile development, major NACA contributions to the military missile programs came in the mid 1950’s.

In 1958, as a result of the escalating space race, President Eisenhower signed the National Aeronautics and Space Act establishing the National Aeronautics and Space Administration (NASA). NASA absorbed the NACA intact: its 8,000 employees, an annual budget of \$100 million, the Langley, Ames and Lewis laboratories and two smaller test facilities. Langley Laboratory, which was then officially designated Langley Research Center, was the largest of the new agency’s field centers, with 3,368 government employees. NASA quickly incorporated other organizations and eventually created ten research and spaceflight centers located around the United States.

Over the years, LaRC has made significant contributions to NASA’s mission. Research performed at LaRC in the 1950’s and 1960’s helped aircraft break the sound barrier and played a major role in helping Americans reach the moon. In the 1970’s, research at the Center focused on aircraft design to cut emissions and noise, and on testing space shuttle concepts. In the 1980’s, triggered by the Cold War, LaRC and its complex of over 20 wind tunnels performed critical military aircraft research. From the 1980’s to the present, LaRC has continued to provide research support and technological advances in aerospace systems concepts and analysis; aerodynamics, aerothermodynamics, and acoustics; structures and materials; airborne systems; and atmospheric sciences. The majority of LaRC’s work has been in aeronautics. Once the largest NASA Center, LaRC is now the fifth largest NASA Center.

Agency-wide, NASA continually evaluates its resources and infrastructure in order to align its capabilities to meet the Agency’s evolving mission. NASA has recently undertaken a monumental transformation in both business practices and mission. In 2004, President George W. Bush announced a new exploration initiative (Constellation project) to return humans to the moon by 2020 in preparation for human exploration of Mars and beyond. The Constellation project includes the development of the Orion crew exploration vehicle and Ares 1 launch vehicle. NASA LaRC’s contribution to the Constellation project includes acting as the lead on the Launch Abort System integration project. The new mission brings not only technical but also financial challenges to the Agency and its field centers, as planners strive to best allocate and utilize limited resources.

#### 1.4 PURPOSE AND NEED FOR THE PROPOSED ACTION

The purpose of proposed action is to streamline NASA LaRC’s infrastructure by removing facilities from the Center’s real property inventory that are no longer operational and/or needed to support NASA’s critical mission.

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The proposed action is needed to allow NASA LaRC to direct limited funding towards the maintenance and operation of facilities that support the Agency's overall mission, currently and in the future. Funds for general maintenance and operation of facilities at NASA LaRC are provided by the various projects and programs utilizing the facility space. Since the five facilities associated with the LTPT Complex are closed and abandoned, no direct funding sources exist for their continued maintenance and upkeep.

## 1.5 PUBLIC AND AGENCY INVOLVEMENT

NASA LaRC sent scoping letters to various local agencies and outside organizations in order to solicit comments regarding the proposed deconstruction of the LTPT Complex. The letters requested assistance in exploring alternatives to deconstruction including possible adaptive reuse of the facilities. LaRC received a response from LAFB expressing interest in the transfer of ownership of Building 582 from NASA to LAFB for use as administrative office space. The National Institute of Aerospace (NIA) expressed an interest in possibly salvaging one of the smaller wind tunnels located within the LTPT Complex for relocation to their campus for reuse as an educational research tool. NASA LaRC is currently consulting with the NIA regarding the logistics and feasibility of such an initiative. The City of Hampton responded that they currently are not in a position to address alternative uses of the LTPT Complex. No other responses were received.

In accordance with the public involvement requirements of the National Historic Preservation Act (NHPA) and NEPA, NASA LaRC invited public comment on the Proposed Action by publishing a notice of intent in the legal section of the *Daily Press* on August 23, 2009. No comments were received from the public regarding the proposed deconstruction of the LTPT Complex.

Since the LTPT Complex facilities are eligible for listing in the National Register of Historic Places, in accordance with Section 106 of the NHPA, NASA LaRC is consulting with the Virginia State Historic Preservation Office (SHPO) regarding the Proposed Action. The Advisory Council on Historic Preservation (ACHP) declined to participate in consultation.

Copies of the scoping letters with received responses, the initial scoping letter distribution list, and the public notice and consultation letters with the ACHP are all included in Appendix A.

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## 2.0 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

### 2.1 PROPOSED ACTION

The Proposed Action consists of the deconstruction of four buildings and the transfer to LAFB of one building associated with the LTPT Complex at NASA LaRC. Table 2-1 provides information about the buildings, as well as the associated Proposed Action. Deconstruction and transfer activities would begin in 2010 and continue through 2012. The term “deconstruction” as opposed to demolition, emphasizes the commitment to reuse and recycle building materials, as discussed in Section 4.5.1. The LTPT Complex is located in NASA LaRC’s East Area, on land leased from LAFB, as shown in Figure 2.1. Photographs of the facilities are provided in Appendix B.

Table 2-1. LTPT Complex Facilities Proposed for Deconstruction or Transfer

<b><i>Building Number</i></b>	<b><i>Building Name</i></b>	<b><i>Year Built</i></b>	<b><i>Year Closed</i></b>	<b><i>Proposed Action</i></b>
582	LTPT Tunnel Office	1921	2006	Transfer to LAFB
582A	LTPT Tunnel Circuit	1940	2006	Deconstruction
583	16 inch and 6 by 28 inch Transonic Tunnel	1938	1996	Deconstruction
583A	16 inch and 6 by 28 inch Transonic Tunnel Storage	1929	1996	Deconstruction
585	6 inch by 19 inch Transonic Tunnel Facility	1934	1996	Deconstruction

The proposed action would reduce the Center’s operation and maintenance costs, as well as streamline the infrastructure to better align LaRC’s capabilities with the future direction of NASA missions. The deconstruction and transfer would result in a reduction of LaRC’s total building inventory by approximately 2,791 square meters (30,042 square feet).

The four buildings proposed for deconstruction would be removed down to and including slabs and foundations. Utilities would be capped below grade, and the properties would be re-graded to match existing site contours. Following removal of the buildings, NASA LaRC would return the land to LAFB. Transfer of Building 582 to LAFB would be carried out in accordance with established real property transfer procedures that have been used by NASA and LAFB in the past for similar building transfers.

Deconstruction activities would be carried out by qualified and properly licensed contractors. All contractors performing work at LaRC are required to comply with applicable safety and health regulations, including Occupational Safety and Health Administration (OSHA) and NASA regulations. Contractors involved in the deconstruction activities would be required to prepare and follow Health and Safety Plans that comply with the regulations to ensure the safety of human health and the environment during the deconstruction.

The debris material resulting from deconstruction would be disposed of according to LaRC’s policy for the disposal of construction/demolition debris. NASA LaRC would require that the deconstruction contractor recycle to the maximum extent possible, debris such as concrete and

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steel. Hazardous or other regulated wastes would be disposed of in accordance with LaRC's established hazardous waste management procedures and following all applicable safety and environmental regulations. All other debris would be removed by the deconstruction contractor and disposed of offsite at a permitted landfill.



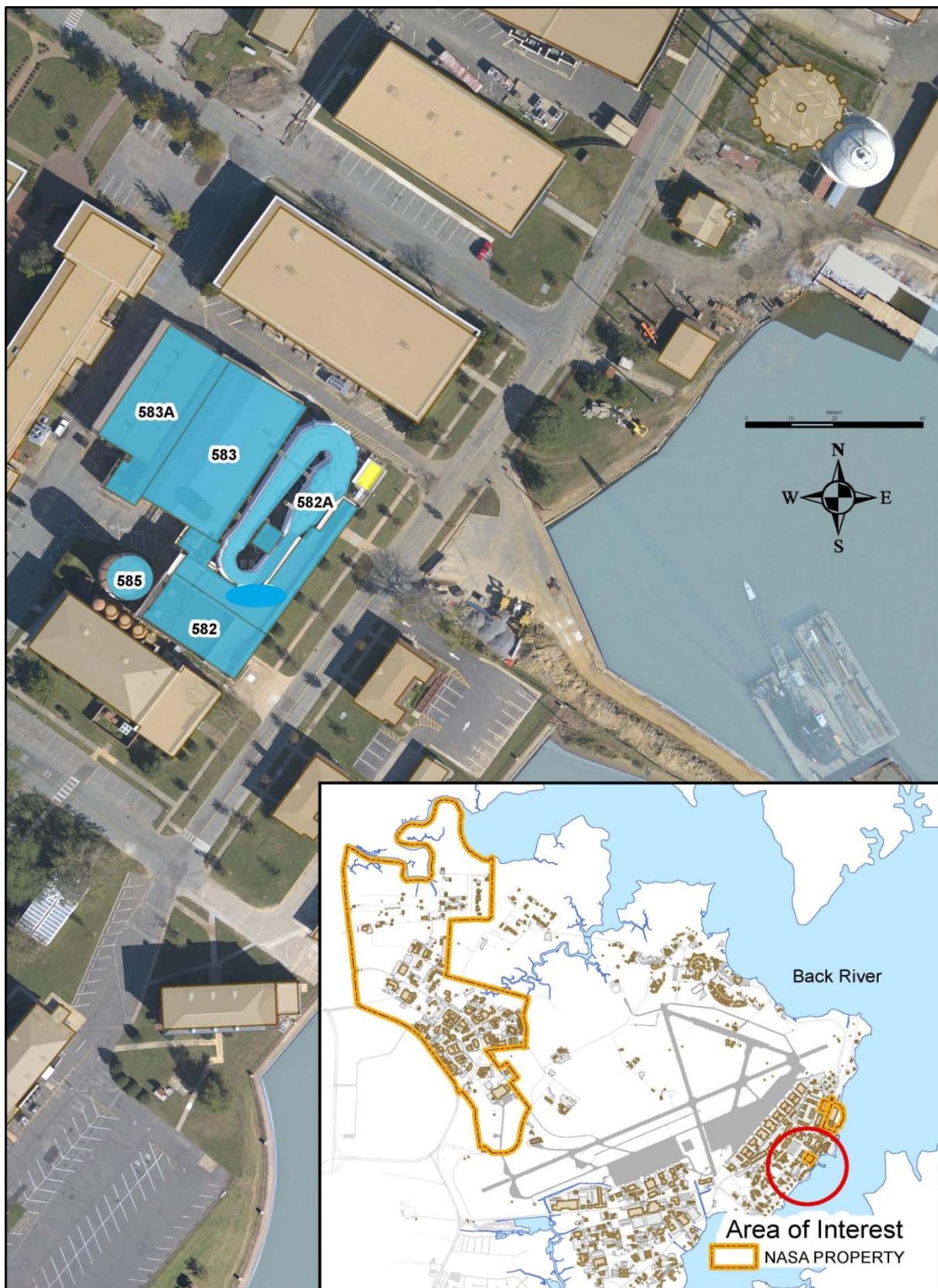
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Figure 2.1 – Location of NASA LaRC's LTPT Complex



## 2.2 ALTERNATIVE

Under the one Alternative, Building 582 would not be transferred to LAFB and it would be deconstructed along with the other four LTPT Complex facilities. All other aspects of the project would be the same as under the Proposed Action.

## 2.3 NO-ACTION ALTERNATIVE

Under the No-Action alternative, LaRC would not deconstruct or transfer the LTPT Complex facilities and they would remain closed and unused. NASA LaRC would continue to monitor and maintain the buildings' emergency utilities, but the facilities would continue to deteriorate. The No-Action alternative would forego the opportunity to streamline the Center's infrastructure and refocus limited resources on the critical infrastructure that is needed to meet NASA LaRC's mission requirements. Implementing the No-Action alternative would result in LaRC expending resources to sustain aging and abandoned infrastructure, which could potentially compromise the Center's mission capabilities.

## 2.4 ALTERNATIVES ELIMINATED FROM FURTHER CONSIDERATION

Several alternatives were considered but eliminated from detailed analysis because they lacked viability or they failed to meet the purpose and need of the Proposed Action. The option of transferring all of the facilities to LAFB was considered; however, LAFB is only interested in reusing Building 582 as administrative office space. The option of leasing the buildings to outside tenants was considered; however, this option would not allow LaRC to streamline its infrastructure or to remove deteriorating facilities that are no longer needed to support NASA's critical mission. The option of transferring ownership of the buildings to outside tenants or organizations was considered; however, no outside entities showed interest in acquiring or adaptively reusing the buildings. In addition, the options to lease or transfer ownership to outside parties are not practical due to the security issues associated with LAFB. The list of agencies and outside organizations contacted by NASA LaRC, as well as the responses received, are included in Appendix A.

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### 3.0 AFFECTED ENVIRONMENT

This chapter describes relevant environmental conditions at NASA LaRC's East Area for resources potentially affected by the Proposed Action, the one Alternative and the No-Action alternative described in Chapter 2.0. In compliance with guidelines contained in NEPA and the Council on Environmental Quality (CEQ) regulations, and NASA Procedural Requirements (NPR) 8580.1, the description of the existing environment focuses on those environmental resources potentially subject to impacts. Since the LTPT Complex is located in NASA LaRC's East Area on land leased from LAFB, the environment includes all areas and lands in the area surrounding the leased LAFB property area that might be affected, as well as the natural, cultural, and socioeconomic resources they contain or support.

#### **Resources Eliminated From Detailed Consideration**

Several resources were not evaluated in this EA because it was determined unlikely that implementation of either the Proposed Action, the one Alternative or the No-Action alternative would have any impacts to these areas of concern. A brief explanation of the reasons why each resource has been eliminated from further consideration in this EA is provided below.

**Virginia Coastal Zone Programs.** The following Virginia Department of Environmental Quality (DEQ) enforceable programs and policies are not applicable because the deconstruction and transfer activities would not have any effect on the resources. Additionally, the No-Action alternative would not have any effect on the resources. The programs and policies include:

**Fisheries Management.** The deconstruction and transfer activities would have no effect on the conservation and enhancement of finfish and shellfish resources or the promotion of commercial and recreational fisheries.

**Subaqueous Lands Management.** The deconstruction and transfer activities would not involve encroachment into, on or over state-owned subaqueous lands.

**Dunes Management.** There are no sand covered beaches or sand dunes in the vicinity of the deconstruction and transfer activities.

**Shoreline Sanitation.** The deconstruction and transfer activities would have no effect on shoreline sanitation.

**Tidal and Nontidal Wetlands Management.** The US Army Corps of Engineers (USACE) and the Environmental Protection Agency (EPA) define wetlands as those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas. A wetland delineation of the entire LAFB property was conducted in late 2000 and verified by the USACE-Norfolk District in January 2004. Based on the results of the survey, NASA LaRC's LTPT Complex is not located within designated wetlands.

Other Virginia Coastal Zone Program areas that are applicable are addressed in Chapters 3 and 4.

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*Soils and Geology.* The deconstruction activities would involve existing structures and previously developed areas. There would be minimal ground disturbance to remove pile caps, foundations and slab sections during deconstruction and the areas would be backfilled and graded to match existing surroundings. Since implementation of the Proposed Action, the one Alternative or the No-Action alternative would have a negligible effect on soils and geology, these resources were eliminated from further analysis.

*Socioeconomic.* The No-Action alternative would have no effect on the socioeconomic character of the communities surrounding LaRC. There would be no change in the number of NASA employees as a result of the Proposed Action or the one Alternative. The deconstruction work would be performed by contractors from the regional work force. There is a sufficient pool of regional workers to accomplish these tasks in the anticipated timeframe. Because these are temporary jobs that would be filled by the existing work force, there would be no effect on area population or increase in the demand for housing or public services in the region. Therefore, implementation of the Proposed Action or the one Alternative would have a negligible effect on the socioeconomic character of the surrounding communities and this resource was eliminated from further analysis.

*Climate.* Climate is the prevalent long-term weather conditions in a particular area. Climatic elements include precipitation, temperature, humidity, sunshine and wind velocity and other natural occurrences such as fog, frost, and hail storms. Implementation of the Proposed Action, the one Alternative or the No-Action alternative would have no measurable effect on the local climate and as such, this resource was eliminated from further analysis.

*Environmental Justice.* Low-income populations and minority populations that are subject to environmental justice considerations are not located within or near the location of the Proposed Action. Since implementation of the Proposed Action, the one Alternative or the No-Action alternative would not have disproportionately high or adverse human health or environmental effects on low-income populations or minority populations, this resource was eliminated from further analysis.

*Threatened and Endangered Species.* Seventeen special status species have the potential to occur on LAFB property. Fifteen have special state status and twelve have federal status. No critical habitat occurs on LAFB. Given the nature of the Proposed Action, the one Alternative and the No-Action Alternative, no impact to threatened or endangered species would be expected. As such, this resource was eliminated from further analysis.

*Transportation.* Implementation of the Proposed Action and the one Alternative would not change the use of transportation resources in the region. Transportation of the deconstruction materials would be along an established haul route leading off LAFB property. The increase in truck traffic would be minimal because the deconstruction activities would be phased over time. Implementation of the No-Action alternative would not affect transportation resources. Therefore, this resource was eliminated from further analysis.

*Vegetation.* The LTPT Complex is located in a highly developed, industrial setting which includes paved roads and parking lots. With the exception of small grassy areas, minimal

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vegetation exists within or near the project area. As such, implementation of the Proposed Action, the one Alternative, or the No-Action alternative would not impact vegetation. Therefore, this resource was eliminated from further analysis.

*Wildlife Resources.* The No-Action alternative would have no effect on the wildlife resources found on LAFB. Implementation of the Proposed Action or the one Alternative would temporarily displace wildlife from the immediate vicinity of the project areas. However, the wildlife found at LAFB are widespread habitat generalist species and generally tolerant of disturbances. All of the buildings in the LTPT complex are located within a highly developed and trafficked area, so it is expected that the impacts to wildlife caused by activities associated with the Proposed Action or the one Alternative would be negligible and short-term. As such, this resource was eliminated from further analysis.

Since NASA LaRC and LAFB do not have any *prime or unique farmland*, or *conservation areas*, these resources were also eliminated from further analysis.

### 3.1 LAND USE

#### *Coastal Zone Management Act*

NASA LaRC is located within the coastal zone of the Commonwealth of Virginia. Federal agency activities within the coastal zone must be carried out in a manner that is consistent to the maximum extent practicable with Virginia's applicable enforceable policies. All federal actions are subject to this consistency requirement if they would affect natural resources, land uses, or water uses in the coastal zone. The Virginia DEQ oversees activities in the coastal zone of the State through a number of enforceable programs. In reviewing the Proposed Action, DEQ may require agencies to coordinate with its specific divisions or other agencies for consultation or to obtain permits; they also may comment on environmental impacts and mitigation. Virginia DEQ enforceable programs and policies pertain to Fisheries Management, Subaqueous Lands Management, Tidal and Nontidal Wetlands Management, Dunes Management, Non-Point Source Pollution Control, Point Source Pollution Control, Shoreline Sanitation, Air Pollution Control, and Coastal Lands Management. Not all of these enforceable programs are applicable to the Proposed Action, as explained in Section 3.0. The remaining programs (coastal lands management, air pollution control, non-point source pollution control, and point source pollution control) are discussed in relevant resource sections (e.g., air quality and water resources).

The Coastal Lands Management program establishes authority for the oversight of activities in the Chesapeake Bay Resource Management Areas (RMAs) and Resource Protection Areas (RPAs). RPAs include tidal shores, tidal wetlands, and non-tidal wetlands that are contiguous to and connected by surface flow to tidal wetlands and perennial streams, and a 30-meter (100-foot) buffer located landward of these features. RMAs include floodplains, highly erodible soils, highly permeable soils, steep slopes, and areas 30 meters (100 feet) landward of an RPA. Certain development activities within these zones are restricted in order to protect the quality of state waters. All of the buildings in the LTPT complex are located within highly developed portions of LaRC's East Area and LAFB and are outside of the RPAs. The facilities are located on the edge of an RMA (shown in Figure 3.1). This area, including most of the RPA nearby, is an Intensely Developed Area. NASA would deconstruct the buildings and return the area to

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green space. NASA would ensure that proper erosion and sediment controls are implemented during the deconstruction and that vegetation native to this region are planted.

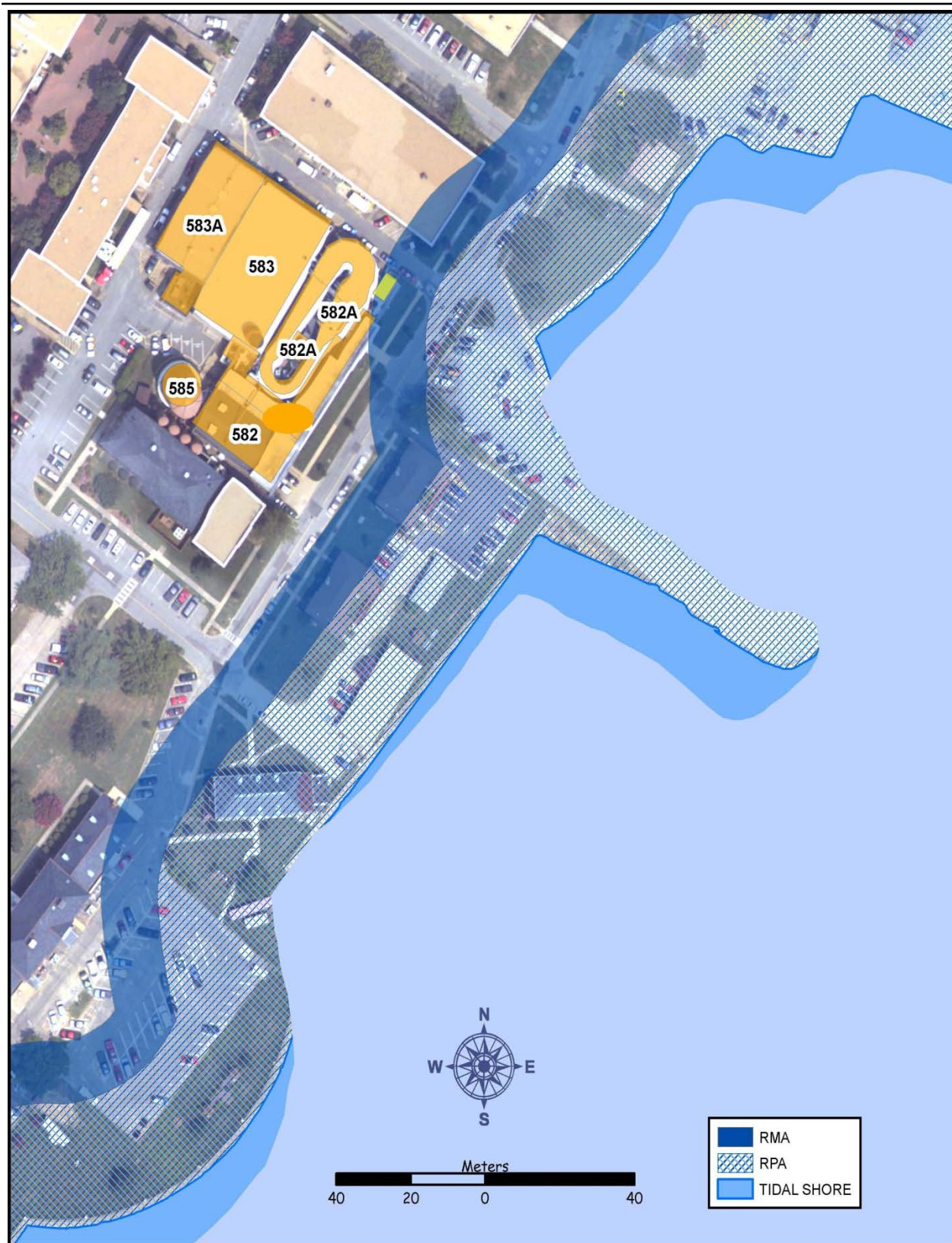
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Figure 3.1 – Resource Protection Areas and Resource Management Areas

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### *Functional Areas*

Land uses are frequently regulated by management plans, policies, ordinances, and regulations that determine the types of uses that are allowable or protect specially designated or environmentally sensitive areas. Land uses on LAFB are grouped by function in distinct geographic areas. For example, aircraft operations and maintenance facilities are located in the southern portion of the base. The residential areas on base are located along the Back River in the southeastern and northeastern portions of the base. LAFB's General Plan serves as the single, integrated, authoritative reference for facilities development and land use at the installation. The General Plan incorporates numerous component plans which deal with more specific aspects of planning (LAFB 2009). NASA LaRC's LTPT Complex is located within a more industrial style setting at LAFB in an area surrounded by both administrative and residential buildings.

### 3.2 NOISE

The fighter aircraft operating from LAFB are by far the dominant and most widespread noise source in the area. The Noise Contour Map (Figure 3.2) was derived from the Air Installations Compatible Use Zone report prepared by LAFB. The decibel (dBA) contours on the map are calculated using the "Ldn" parameter, which is preferred by the EPA for assessing environmental noise impacts. It accounts for all the noise occurring throughout the 24-hour day but with a 10-decibel penalty added to the nighttime hours to account for people's greater sensitivity to noise at night. Ldn levels up to 65 dBA are generally considered acceptable for residences. LaRC's LTPT Complex is located in the 75 dBA noise contour zone.

Although Virginia does not have noise control regulations, the City of Hampton has enacted a Noise Ordinance (Hampton City Code, Section 22) which prohibits creating any unreasonably loud or disturbing noise of such character, intensity, or duration that may be detrimental to the life or health of any individual or which disturbs the public peace and welfare. NASA LaRC's Industrial Hygiene staff monitors noise levels both inside and outside of the Center facilities to ensure excessive noise does not harm human health or the environment. In addition, the Industrial Hygiene staff ensures proper controls are in place to protect Center personnel from exposure to excessive noise levels in accordance with Occupational Safety and Health Administration (OSHA) requirements.



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Figure 3.2 – Noise Contours



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### 3.3 CULTURAL RESOURCES

Cultural resources are any prehistoric or historic district, site, building, structure, or object considered important to a culture, subculture, or community for scientific, traditional, religious or other purposes. They include archaeological resources, traditional resources, and historic architectural resources. Traditional resources are associated with cultural practices and beliefs of a living community that are rooted in its history and are important in maintaining the continuing cultural identity of the community. Archaeological resources are locations where prehistoric or historic activity measurably altered the earth or produced deposits of physical remains (e.g., arrowheads, bottles). Historic architectural resources include standing buildings, dams, canals, bridges, and other structures of historic or aesthetic significance. Historic properties (as defined in 36 CFR 60.4) are significant archaeological, architectural, or traditional resources that are either eligible for listing, or listed in, the National Register of Historic Places (National Register).

The management of cultural resources is primarily regulated by the National Historic Preservation Act (NHPA). Section 106 of the NHPA requires Federal agencies to take into account the effects of their undertakings on historic properties. Impacts to cultural resources may be considered adverse if the resources have been determined to be eligible for listing in the National Register. Section 110 of the NHPA advocates proactive management of resources through the incorporation of historic preservation into the comprehensive plans of agencies, facilities, or programs. The act requires agencies to compile cultural resource inventories which should be integrated into systems for property administration, land use planning and project planning.

The Archaeological Resources Protection Act (ARPA) preserves and protects resources and sites on Federal and Indian lands by prohibiting the removal, sale, receipt, or interstate transportation of archaeological resources obtained illegally (i.e., without permits) from public or Indian lands. ARPA permits are not required for archaeological work conducted by or on behalf of LaRC; however, the specific requirements of ARPA may be addressed in contract documents or other documentation authorizing the work.

For activities on Federal lands, the Native American Graves Protection and Repatriation Act (NAGPRA) requires consultation with “appropriate” Indian tribes or Native Hawaiian organizations prior to the intentional excavation or removal after inadvertent discovery, of several kinds of cultural items. Native American cultural items include human remains, associated funerary objects, unassociated funerary objects, sacred objects, and cultural patrimony. Native American cultural items are the property of Native American groups. For activities on Native American or Native Hawaiian lands, which are defined in the statute, NAGPRA requires the consent of the Indian tribe or Native Hawaiian organization prior to the removal of cultural items. The law also provides for the repatriation of such items from Federal agencies and federally assisted museums and other repositories. Agencies must inventory Native American cultural items, repatriate Native American cultural items, and consult with Native American groups about permits to excavate.

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LaRC has a Cultural Resource Management Plan (CRMP) that contains information on LaRC's historic background, cultural resources and historic properties. It provides information on cultural resource surveys that have been performed at the Center and the types of LaRC activities that may affect cultural resources. The CRMP also provides information and guidelines for preservation and management of LaRC's cultural resources and historic properties. Although oversight of the cultural resource program at LaRC is primarily the responsibility of LaRC's Historic Preservation Officer (HPO), all persons involved in project planning and implementation at the Center also have a responsibility to be aware of the cultural resource management goals of both NASA and LaRC, and to see that NASA complies with historic preservation laws and regulations. Sections of LaRC's CRMP are integrated with the Center's Master Plan and Geographic Information System (GIS) database in order to facilitate project planning and ensure historic preservation issues are addressed in project planning at the Center.

### 3.3.1 Architectural Resources

NASA LaRC has five properties that are National Historic Landmarks (NHLs): the Variable Density Tunnel, the 8-Foot High Speed Tunnel (Building 641), the Full Scale Tunnel (Building 643), the Rendezvous Docking Simulator, and the Lunar Lander Facility (Building 1297). These properties were identified during a 1985 survey performed by the National Park Service as part of the "Man in Space" theme study. The wind tunnels provided the technological base from which the early space program was initiated, and the training facilities played an important role in preparing astronauts to operate in space and land on the moon.

LaRC recently completed a center-wide reconnaissance level survey of all architectural resources located throughout the Center. The survey identified a potential NASA LaRC historic district with extant buildings and structures in both the East Areas and West Areas that illustrates the major contributions and advances made by NASA researchers in the fields of aeronautics and space flight. The district is potentially eligible for listing in the National Register under Criterion A and C because of major contributions the facilities made to aeronautics and space research testing. The boundaries of the proposed district are discontinuous with three sections: one large section in LaRC's West Area, and two smaller sections in the East Area.

Table 3-1 below provides the National Register eligibility for each facility that would be affected by the Proposed Action. The survey identified that Buildings 582 and 582A are potentially eligible for listing in the National Register both individually, and as contributing resources to the proposed historic district. Buildings 583, 583A and 585 are eligible as contributing resources to the historic district. Figure 3.4 shows the location of the buildings in relation to the proposed NASA LaRC Historic District boundaries.

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Table 3-1 Architectural Resources Affected by Proposed Deconstruction

<b>Building Number</b>	<b>Name of Building</b>	<b>Year Built</b>	<b>National Register Eligibility</b>
582	LTPT Tunnel Office	1921	Individual and Contributing
582A	LTPT Tunnel Circuit	1940	Individual and Contributing
583	16 inch and 6 by 28 inch Transonic Tunnel	1938	Contributing
583A	16 inch and 6 by 28 inch Transonic Tunnel Storage	1929	Contributing
585	6 inch by 19 inch Transonic Tunnel Facility	1934	Contributing

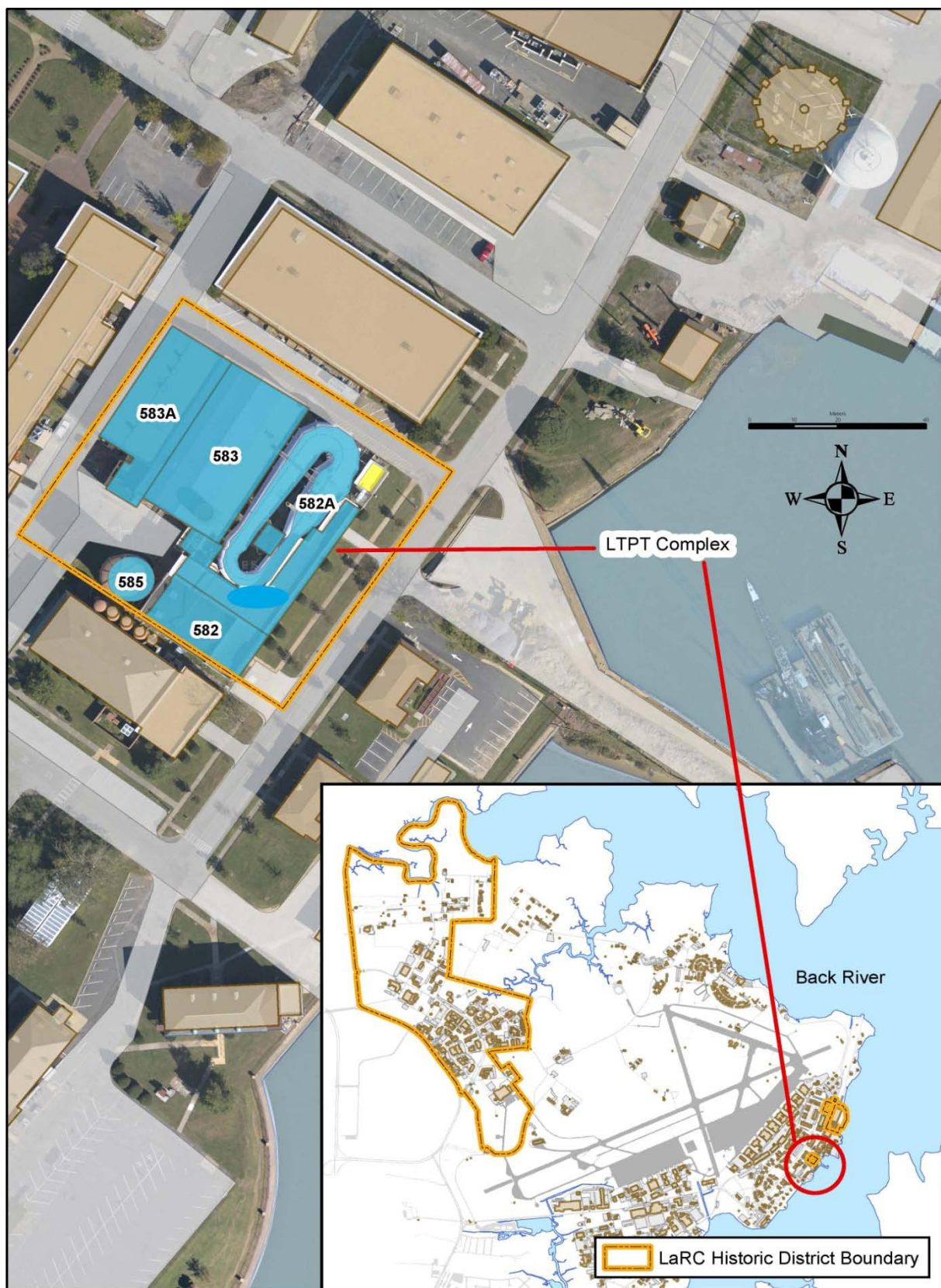
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Figure 3.3 – NASA LaRC Historic District Boundaries

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### 3.3.2 Archaeological Resources

Archaeological surveys on LAFB property have examined 370 hectares (915 acres) which is 32 percent of the total land on the base. An additional 701 hectares (1,732 acres) cannot be surveyed for various reasons. In total, 73% of the base has been either surveyed or has been found to be infeasible to survey. Twenty six archaeological sites have been found to date (LAFB 2009). None of the sites are located near the LTPT Complex.

### 3.3.3 Traditional Resources

Although Native American resources have been discovered during cultural resource surveys performed at LAFB, none have been identified as properties of traditional or cultural importance to Native Americans or other traditional groups (LAFB 2009). No federally recognized Indian tribes or lands are located in Virginia.

## 3.4 HAZARDOUS, REGULATED AND SOLID WASTE

NASA LaRC has established a pollution prevention policy with the goal of minimizing the volume and toxicity of wastes generated at the Center to the extent technically and economically feasible. Source reduction, recycling, recovery and reuse are utilized whenever possible.

Hazardous wastes generated at LaRC are managed and disposed of according to established Center policies and applicable laws and regulations. LaRC is considered a large quantity generator of hazardous waste. The Center is not authorized to transport hazardous waste off-site, store hazardous waste beyond a 90-day accumulation period, or treat or dispose of hazardous waste on site. The hazardous and regulated wastes generated at LaRC include of a wide variety of items, such as solvents, fuels, oils, gases, batteries, fluorescent light bulbs and laboratory chemicals. Waste generated from remediation projects such as paint removal and spill cleanup are sampled and analyzed to ensure proper waste characterization and disposal. Any materials that contain hazardous waste or exhibit hazardous characteristics are transported by an appropriately permitted contractor to a permitted hazardous waste disposal facility.

LaRC ensures the proper management and disposal of materials containing polychlorinated biphenyls (PCBs). All large transformers at the Center that contained PCBs have been retrofilled or removed. Many of the older facilities at the Center still have small PCB light ballasts or capacitors. LaRC ensures that PCB materials are properly packaged, transported and disposed of at an approved disposal facility. Similar requirements apply for the management of Asbestos Containing Materials (ACM). ACM have been identified in Buildings 582, 582A, 583, and 583A. All contractors performing asbestos work at LaRC must be appropriately licensed, and the waste must be properly packaged, labeled and transported to a permitted landfill.

LaRC maintains an Integrated Spill Contingency Plan that provides information on applicable regulatory requirements and procedures related to oil and hazardous material spill control at LaRC. In addition it documents the policies and procedures regarding the management of underground and aboveground storage tanks. There are no storage tanks located at the buildings proposed for deconstruction.

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LaRC generates large volumes of municipal solid waste. The major items are paper, wood, metals, cardboard, plastics, grass and tree clippings, glass, and maintenance wastes. NASA LaRC recycles white and mixed paper, cardboard, toner cartridges, plastic bottles, aluminum cans, scrap metal, used oil, batteries, fluorescent light bulbs, and used tires. Non-hazardous, non-regulated, solid materials that are not collected for recycling are consolidated and transported for disposal to a local landfill or for energy recovery at Hampton's Refuse-Fired Steam Generating Facility.

### 3.5 POLLUTION PREVENTION

Pollution prevention (P2) is a multimedia approach to environmental management based on the priorities outlined in the Pollution Prevention Act of 1990. When applying P2 methodologies to LaRC activities (e.g. operations generating air emissions, wastewater, or solid/hazardous waste), priority is given to the use of source reduction techniques. Source reduction is the prevention of waste generation through process modifications or material substitutions. Where source reduction is not feasible, other environmentally preferable methods such as reuse or recycling may be appropriate. Remaining wastes are then managed to minimize potential present and future environmental impacts. LaRC developed a P2 Plan in 1992 to document P2 initiatives and has been implementing a Center-wide P2 Program since that date.

Over the last few years LaRC's P2 Program has been integrated into the broader Environmental Management System (EMS) program that:

1. incorporates people, procedures, and work practices in a formal structure to ensure that the important environmental impacts of the organization are identified and addressed,
2. promotes continual improvement including periodically evaluating environmental performance,
3. involves all members of the organization as appropriate, and
4. actively involves Senior Management in support of the environmental management program.

LaRC's EMS is committed to the goals of Executive Order 13423, "Strengthening Federal Environmental, Energy and Transportation Management," which calls for Federal facilities to conduct their environmental activities in a continuously improving, efficient, and sustainable manner. Executive Order 13423 also dictates Agency goals regarding:

- Vehicles
- Petroleum conservation
- Alternative fuel use
- Energy efficiency
- Greenhouse gases
- Renewable power
- Building performance
- Water conservation
- Procurement
- Toxic materials and chemicals



- Electronics management

One of the P2 objectives of LaRC's Environmental Management System is to ensure that debris from facility construction and demolition activities is reused and recycled to the maximum extent practical.

### 3.6 HEALTH AND SAFETY

NASA LaRC adheres to OSHA and applicable Federal, State and local safety and health regulations. In addition to Federal regulations LaRC also implements its own health and safety regulations many of which are referenced in Langley Policy Directive 1700.1, "Safety Program." This directive sets forth the Center's Safety Policy, which is to provide employees a safe and healthful work environment that is free from hazards that can cause or result in loss of life or injury or damage to equipment and property.

The Center Director is the ranking official charged with the ultimate responsibility for the Center's Safety Program. Implementation of the program is achieved through specific delegation of responsibilities. The LaRC Safety Office is responsible for the day-to-day implementation of LaRC's Safety Program. Each building at the Center is assigned a Facility Safety Head (FSH) and Facility Coordinator (FC) to ensure operations are carried out in accordance with the LaRC's safety requirements. The FSH and FC responsibilities include establishing emergency operation procedures, reviewing and implementing facility operational procedures, and personnel training.

LaRC has been recognized by OSHA as a leader in health and safety by awarding the Center the Star designation level of achievement in the Voluntary Protection Program (VPP). In addition to its VPP and Safety Programs, LaRC has its own fire program and maintains a fire department on site which is centrally located at Building 1248. In the event of an emergency such as fire, explosion, chemical spill or other accident, fire department personnel serve as first responders to initiate actions as necessary to minimize hazards to all personnel and limit damage to property and the environment.

As part of its Safety Program, contractors performing work at NASA LaRC must comply with all applicable safety and health regulations, including OSHA, Agency and Center regulations. Contractors are responsible for providing their own employees with a safe and healthful workplace, and for ensuring their work is performed in a safe manner. Every major on-site contractor must have a designated Safety Officer and site-specific safety and health plan. For off-site contractors performing temporary work at the Center, supervisory personnel must attend a safety briefing provided by the LaRC Safety Office prior to project startup.

### 3.7 VISUAL RESOURCES

The aesthetic quality of an area or community is composed of visual resources. Physical features that make up the visible landscape include land, water, vegetation and man-made features, such as buildings, roadways and structures. As defined in the Center Master Plan, LaRC's buildings and structures reflect two broad architectural themes: an entirely functional architecture, such as wind tunnels; and institutional architecture, typical of various period architectural styles.

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Examples of institutional architecture at LaRC include Brick Box, Fluid Structure, Metal Box, Panel Type, Open Volume, and New Campus. Details of the architectural category types the buildings proposed for deconstruction and transfer fall into are provided below:

Brick Box architecture (includes Building 582):

- Two or three story red-brick, veneer buildings with window and door openings "punched" into the masonry surfaces.
- Window units usually arranged in a horizontal manner with textured divisions established by masonry patterns.
- Horizontal elements established with stone window sills and parapet copings.
- Window frames generally dark bronze in color.
- Usually flat roof surfaces.

Fluid Structures architecture (includes Buildings 582A and 585):

- Spherical and cylindrical building forms.
- Exposed structural elements.
- Silver or white color.
- Large scale elements which become dominant focal points throughout the Center.
- Functional elements clearly articulated.

Metal Box architecture (includes Buildings 583 and 583A):

- Flat roof structures.
- Aluminum panels used as exterior skins.
- Generally used in conjunction with "brick-box" or "panel-type" buildings.

The LTPT Complex is located within an industrial setting on LAFB in an area surrounded by both administrative and residential buildings, which can be mostly categorized as Brick Box architecture. Other unique structures at LAFB include large aircraft maintenance facilities and Albert Kahn-designed hangars.

### 3.8 AIR QUALITY

The Virginia DEQ administers the state's air Operating Permit Program. LaRC has a State Operating permit that establishes emission limits for specific stationary air pollution sources as well as Center-wide emission limits. The Center is not required to have a Title V Federal Operating Permit. LaRC qualifies as a synthetic minor source because its air emissions are limited below the prescribed thresholds by its air permit. The Center's air permit contains enforceable conditions that limit the amount of air pollutants that LaRC may emit. Specific permit requirements vary according to the air pollution source, but they generally include physical, operational, record keeping and reporting requirements.

The Clean Air Act (42 U.S.C. 7401 et. seq.), as amended, establishes the authority to set safe concentration levels for six criteria pollutants: particulate matter measuring less than 10 microns in diameter (PM<sub>10</sub>), sulfur dioxide (SO<sub>2</sub>), carbon monoxide (CO), nitrogen oxides (NO<sub>x</sub>), ozone (O<sub>3</sub>), and lead (Pb). LaRC is located within the Hampton Roads Intrastate Air Quality Control Region (AQCR). The Hampton Roads AQCR includes four counties (Isle of Wight, James City,



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Southampton, and York), as well as ten cities (Chesapeake, Franklin, Hampton, Newport News, Norfolk, Poquoson, Portsmouth, Suffolk, Virginia Beach, and Williamsburg). Air quality in the Hampton Roads AQCR is currently designated as attainment for all criteria pollutants. However, the Hampton Roads AQCR is considered an 8-hour ozone maintenance area.

The General Conformity Rule of the Clean Air Act (Section 176(c)) prohibits Federal actions in nonattainment or maintenance areas which do not conform to the State implementation plan (SIP) for the national ambient air quality standards. An action is subject to the general conformity rule if the emissions from a proposed Federal action in a nonattainment or maintenance area exceed certain annual emission thresholds (de minimis levels) or are regionally significant (i.e. greater than or equal to 10% of the emissions inventory for the region). In the Hampton Roads AQCR, the applicable de minimis thresholds are 100 tons per year of NO<sub>x</sub> and 100 tons per year of Volatile Organic Compounds (VOCs). Regionally significant (10%) emissions inventories in the Hampton Roads AQCR would be 715.2 tons per year of NO<sub>x</sub> and 879 tons per year of VOCs.

### 3.9 WATER RESOURCES

#### *Surface Waters*

NASA LaRC is located on the coastal basin of the Back River, which flows into the Chesapeake Bay. The entire LaRC East Area drains to the Back River. An upstream segment of Brick Kiln Creek, all of Tabbs Creek, and the Back River are listed as impaired waters by the EPA. All local waterways are influenced by tides in the Chesapeake Bay.

LaRC operates under three water discharge permits. A permit from the Hampton Roads Sanitation District (HRSD) allows LaRC to discharge non-hazardous industrial wastewater and sanitary sewage to the HRSD sanitary sewer system. The Center has two water permits under the Virginia Pollutant Discharge Elimination System (VPDES), which regulate industrial process wastewater and storm water discharges from the Center. LaRC has ten permitted outfalls in the West Area, and the Center performs periodic sampling and monitoring of the effluent from the outfalls to ensure compliance with permit limits. No permitted outfalls exist in LaRC's East Area.

In accordance with Virginia's Department of Conservation and Recreation (DCR), construction activities at NASA LaRC that disturb equal to or greater than 4047 square meters (one acre) require coverage under the General Permit for Discharges of Stormwater From Construction Activities. Additionally, since LaRC is within a Chesapeake Bay Preservation locality, construction activities any larger than 232 square meters (2,500 square feet) also require coverage.

NASA LaRC has few water pollution sources due to the relatively low level of industrial operations at the Center. The major pollutants are the chemicals used to treat the boilers and cooling towers, and these are discharged in accordance with LaRC's permits. LaRC employs various Best Management Practices to prevent or mitigate storm water and/or sewer system pollution from facility activities.

*Floodplains*

Floodplains are the flood-prone, lowland areas adjoining inland and coastal water including areas of offshore islands. The 100-year floodplain area is considered the area where there is a one percent chance of flooding in any given year. Due to its proximity to the Chesapeake Bay and Back River, and its low ground elevation, much of LAFB lies within the 100-year floodplain. As such, all of the LTPT Complex buildings are located within the 100-year floodplain. Additionally, LAFB is susceptible to high tide surges during storms and spring tides, and flooding is sometimes severe on the base.

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## 4.0 ENVIRONMENTAL IMPACTS

This chapter describes the potential impacts or effects of the Proposed Action, the one Alternative and the No-Action alternative on the environmental resources described in Chapter 3.

### 4.1 LAND USE

#### 4.1.1 Proposed Action

##### *Coastal Zone Management*

Since NASA LaRC is located within the coastal zone as defined under Virginia DEQ's Coastal Zone Management Program, proposed activities at LaRC must be consistent with the enforceable policies regarding coastal resources. As noted in Section 3.0, the following enforceable policies are not applicable to the location of the Proposed Action: Fisheries Management, Subaqueous Lands Management, Dunes Management, Tidal and Nontidal Wetlands Management, and Shoreline Sanitation. The Coastal Lands Management policy is addressed in this section and the remaining Coastal Zone Management Program policies relating to air and water pollution are addressed in Section 4.8 and Section 4.9 respectively. As described in these sections, the Proposed Action and one Alternative would be consistent with the Coastal Zone Management Program's enforceable policies. NASA LaRC sent a separate Consistency Determination regarding the proposed deconstruction and transfer activities to DEQ on September 1, 2009.

The Coastal Lands Management program establishes authority for the oversight of activities in the Chesapeake Bay Resource Management Areas (RMAs) and Resource Protection Areas (RPAs). Certain development activities within these zones are restricted in order to protect the quality of state waters. LaRC's LTPT Complex is located on the edge of a RMA. This area, including most of the RPA nearby, is an Intensely Developed Area. The transfer of Building 582 to LAFB would not impact the RMA. NASA would ensure that proper erosion and sediment controls are implemented during deconstruction of the other four buildings. The removal of buildings would facilitate the infiltration of storm water into the ground by decreasing impervious surface area. The reintroduction of vegetation into the area would also provide a natural buffer area around the nearby water resource. As such, implementation of the Proposed Action would have a minor positive impact on the RMA and land use in the area around the LTPT Complex.

##### *Functional Areas*

The transfer of Building 582 to LAFB would be in accordance with LaRC's Master Plan as well as LAFB's General Plan requirements. The building would be used as administrative office space, which is consistent with the surrounding functional area. The deconstruction of the other four buildings would involve localized changes from developed industrial use to open space. The building removal would have an environmental benefit because there would be an increase of green space resulting from a facility footprint reduction of approximately 2,310 square meters (24,864 square feet). Implementation of the Proposed Action would have a minor positive impact to the functional use of the area around the LTPT Complex.

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#### 4.1.2 Alternative

Under the Alternative, Building 582 would not be transferred to LAFB and it would be deconstructed along with the other four LTPT Complex facilities. Facility footprint reduction would increase to approximately 2,791 square meters (30,042 square feet). Impacts to land use and functional areas would be the same as under the Proposed Action.

#### 4.1.3 No-Action

Under the No-Action alternative, NASA LaRC would not deconstruct or transfer the LTPT Complex facilities, and there would be no change to the land use or functional areas in the area surrounding the LTPT Complex.

### 4.2 NOISE

#### 4.2.1 Proposed Action

Transfer of Building 582 to LAFB would not impact the noise environment at the base. With the deconstruction of the other four buildings, heavy equipment and vehicles would cause temporary increases in noise at the project area and along traffic corridors. The LTPT Complex is located in a highly developed area, and high noise levels generated from aircraft and other industrial operations are common. Compared to noise generated by aircraft, noise produced by the deconstruction activities would generally be more impulsive, relatively lower in magnitude, and spread out during the day. As such, implementation of the Proposed Action would have a negligible effect on the noise environment in the area around the LTPT Complex.

#### 4.2.2 Alternative

Under the Alternative, Building 582 would not be transferred to LAFB and it would be deconstructed along with the other four LTPT Complex facilities. Impacts on the noise environment in the area would be the same as under the Proposed Action.

#### 4.2.3 No-Action

Under the No-Action alternative, NASA LaRC would not deconstruct or transfer the LTPT Complex facilities, and there would be no change in noise levels in the surrounding area.

### 4.3 CULTURAL RESOURCES

#### 4.3.1 Architectural Resources

##### 4.3.1.1 Proposed Action

Implementation of the Proposed Action would impact NASA LaRC's cultural resources as all of the facilities are potentially eligible for listing in the National Register. The transfer of Building 582 to LAFB would result in a positive impact to the property as the building would remain extant and be used in a manner consistent with previous use of the building as administrative office space. NASA LaRC would ensure that transfer of the building to LAFB included provisions to retain the external integrity of the facility in a manner that is consistent with the surrounding buildings which have similar architecture.

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Deconstruction of the other four buildings would result in an adverse impact to LaRC's cultural resources. In accordance with Section 106 of the NHPA, and in consultation with the Virginia State Historic Preservation Officer (SHPO), LaRC plans to minimize the adverse affects of removal of the buildings through carrying out mitigation measures as prescribed in the Memorandum of Agreement (MOA) between NASA LaRC and the SHPO (dated December 1, 2009). . Examples of mitigation include preparing documentation to record the history of the facilities and adding information about the facilities to the Center's Cultural Resource Management (CRM) website. Maintained by the HPO, the website includes photos, historical documents, virtual tours, and interviews of researchers that worked at the facilities. A copy of the MOA is included in Appendix C.

#### 4.3.1.2 Alternative

Under the Alternative, Building 582 would not be transferred to LAFB and it would be deconstructed along with the other four LTPT Complex facilities. Deconstruction of Building 582 would result in an adverse impact to LaRC's cultural resources since NASA has determined that the building is eligible for the National Register both individually, and as a contributing resource to the LaRC Historic District. In accordance with Section 106 of the NHPA, NASA LaRC would minimize the adverse impacts through developing mitigation measures in consultation with the SHPO. Mitigation measures would be similar to those carried out under the Proposed Action.

#### 4.3.1.3 No-Action

Under the No-Action alternative, NASA LaRC would not deconstruct or transfer the LTPT Complex facilities, and there would be no change to LaRC's cultural resources.

### 4.3.2 Archaeological Resources

#### 4.3.2.1 Proposed Action

The buildings proposed for deconstruction are located in highly industrialized areas that have experienced previous ground disturbance, and the discovery of intact archaeological resources would not be anticipated. If archaeological resources exist in these areas, they would be in highly disturbed secondary contexts. Additionally, with the exception of capping utilities and removing slab foundations, deconstruction activities would involve incidental subsurface ground disturbance. In the event that resources were uncovered during deconstruction, all earthmoving activity would immediately stop and NASA LaRC would notify the SHPO. In addition, LaRC would implement the protective procedures included in Section 4.6 of the CRMP, "Unanticipated Discovery of Cultural Materials or Human Remains." As such, implementation of the Proposed Action would not affect known archaeological resources.

#### 4.3.2.2 Alternative

Under the Alternative, Building 582 would not be transferred to LAFB and it would be deconstructed along with the other four LTPT Complex facilities. Impacts to archaeological resources would be the same as under the Proposed Action.

#### 4.3.2.3 No-Action

Under the No-Action alternative, NASA LaRC would not deconstruct or transfer the LTPT Complex facilities, and there would be no impact to archaeological resources.

#### 4.3.3 Traditional Resources

##### 4.3.3.1 Proposed Action

There are no traditional resources located at LaRC's East Area so the Proposed Action would have no impact on this resource.

##### 4.3.3.2 Alternative

There are no traditional resources located at LaRC's East Area so the Alternative would have no impact on this resource.

##### 4.3.3.3 No-Action

There are no traditional resources located at LaRC's East Area so the No-Action alternative would have no impact on this resource.

#### 4.4 HAZARDOUS, REGULATED AND SOLID WASTE

##### 4.4.1 Proposed Action

Prior to transferring Building 582 to LAFB, NASA LaRC would remove any drums or containers of hazardous and regulated wastes from the facility and dispose of such in accordance with LaRC's waste management procedures and applicable Federal, State, and local regulations. All hazardous and regulated waste generated from deconstruction of the other four buildings would be disposed of in a similar manner. Prior to deconstruction, the buildings would be thoroughly inspected for hazardous and regulated materials, such as mercury switches, fluorescent light bulbs, oils, chemicals, and lead-based paints. Many of the older facilities at the Center still have small PCB light ballasts or capacitors. LaRC ensures that PCB materials are properly packaged, transported and disposed of at an approved disposal facility. Small amounts of ACM have been identified in Buildings 582, 582A, 583, and 583A. All contractors performing asbestos work at LaRC would be appropriately licensed and permitted, and the waste would be properly packaged, labeled and transported to a permitted landfill.

Implementation of the Proposed Action would generate large volumes of solid waste including concrete, structural steel, and miscellaneous building components. As described in 4.5.1, contractors would be directed to recycle materials to the maximum extent possible, thereby reducing the amount of debris disposed in landfills. Non-hazardous, non-regulated, solid materials that are not collected for recycling would be consolidated and transported for disposal to a local landfill. As such, implementation of the Proposed Action would have a negligible impact on the environment resulting from the generation of hazardous, regulated and solid waste.

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#### 4.4.2 Alternative

Under the Alternative, Building 582 would not be transferred to LAFB and it would be deconstructed along with the other four LTPT Complex facilities. There would be a slight increase in the amounts of hazardous, regulated and solid waste generated; however, the impact to the environment from the additional deconstruction activities would still be negligible.

#### 4.4.3 No-Action

Under the No-Action alternative, LaRC would not deconstruct or transfer the LTPT Complex facilities, and there would be no change to the current levels of hazardous, regulated or solid waste generation at NASA LaRC.

### 4.5 POLLUTION PREVENTION

#### 4.5.1 Proposed Action

The deconstruction and transfer activities would be carried out following NASA LaRC's principles of P2, to include source reduction, recycling/reuse, treatment and proper disposal of wastes. "Deconstructing" the buildings, as opposed to demolition, would include the dismantling and extracting of reusable/recyclable materials prior to the destruction/removal of the facility. Materials extracted from the buildings such as concrete, steel structural elements and other metals would be recycled to the maximum extent possible. Maximizing recycling in order to reduce the quantity of materials disposed in the local landfill is one of LaRC's P2 goals. While there would be an increase in solid waste generated from deconstruction activities, this would be offset by eliminating the need for future maintenance on the facilities that could potentially result in pollution, such as painting, cleaning, and other general maintenance activities. Furthermore, contractors would be required to follow applicable Best Management Practices to further reduce pollution. As such, use of P2 practices would ensure that the implementation of the Proposed Action would have minimal impacts on the environment.

#### 4.5.2 Alternative

Under the Alternative, Building 582 would not be transferred to LAFB and it would be deconstructed along with the other four LTPT Complex facilities. The use of P2 practices would be the same as under the Proposed Action, and as such, implementation of the Alternative would have minimal impacts on the environment.

#### 4.5.3 No-Action

Under the No-Action alternative, NASA LaRC would not deconstruct or transfer the LTPT Complex facilities, and there would be no change in the levels of wastes or pollution generated at NASA LaRC.

### 4.6 HEALTH AND SAFETY

#### 4.6.1 Proposed Action

The deconstruction and transfer activities performed during the Proposed Action would be carried out by qualified and properly licensed and permitted contractors. All contractors

Environmental Assessment for Deconstruction and Transfer of  
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performing work at LaRC are required to comply with all applicable safety and health regulations, including OSHA and NASA regulations. Contractors involved in the Proposed Action would be required to prepare and follow a site-specific Health and Safety Plan that complies with the regulations to ensure the safety of human health and the environment during the deconstruction activities. Adherence to applicable health and safety procedures would minimize the risk of injury to either the contractors working in the active project area or the surrounding LaRC and LAFB personnel. Therefore, implementation of the Proposed Action would have minimal impacts on worker health and safety.

#### 4.6.2 Alternative

Under the Alternative, Building 582 would not be transferred to LAFB and it would be deconstructed along with the other four LTPT Complex facilities. Impacts to worker health and safety would be the same as under the Proposed Action.

#### 4.6.3 No-Action

Under the No-Action alternative, LaRC would not deconstruct or transfer the LTPT Complex facilities, and there would be no impacts to worker health and safety.

### 4.7 VISUAL RESOURCES

#### 4.7.1 Proposed Action

Implementation of the Proposed Action would remove aging and deteriorating buildings and infrastructure and create open space within industrialized areas. The resulting open space would improve the visual resources around the project area as the areas would be graded and seeded following deconstruction. Although visual resources in the immediate project area would be temporarily degraded during the active deconstruction, the resulting open space would provide enhanced visual quality. Transfer of Building 582 would result in minor positive impacts to visual resources as the building would be renovated and maintained by LAFB in a manner that is consistent with the surrounding buildings that have a similar style of architecture. Therefore, implementation of the Proposed Action would have a long-term positive impact on visual resources in the area around the LTPT Complex.

#### 4.7.2 Alternative

Under the Alternative, Building 582 would not be transferred to LAFB and it would be deconstructed along with the other four LTPT Complex facilities. Impacts to visual resources would be the same as under the Proposed Action with the exception that removal of Building 582 would create additional open space within a highly industrialized area.

#### 4.7.3 No-Action

Under the No-Action alternative, the exterior of the aging facilities would continue to deteriorate, and no new open green space would be created. Eventual degradation would result in a decline in aesthetic quality of the area in and around where the buildings are located. As such, implementation of the No-Action alternative would result in a minor negative impact to the visual resources in the area around the LTPT Complex.



## 4.8 AIR QUALITY

### 4.8.1 Proposed Action

The transfer of Building 582 to LAFB would not impact air quality in the area around the LTPT Complex. The deconstruction of the other four buildings would result in a slight increase in emissions from vehicle/equipment exhaust and from fugitive dust. These effects would be minor and short term during the length of the project. In relation to the large number of personal and Government vehicles operating on LAFB, the additional emissions resulting from vehicles and from equipment would be negligible. In addition, fugitive dust would be minimized by using control methods outlined in the Virginia Regulations for the Control and Abatement of Air Pollution (9 Virginia Administrative Code 5-50-90). These precautions may include the use of water for dust control, covering of open equipment for conveying materials, prompt removal of spilled or tracked dirt from paved streets, and removal of dried sediments resulting from soil erosion.

The Proposed Action is not subject to the General Conformity Rule of the Clean Air Act because emissions of applicable pollutants would not exceed annual de minimis thresholds, nor are they regionally significant (i.e. 10% of regional emissions inventory). Since the Hampton Roads Air Quality Control Region (AQCR) is an ozone maintenance area, the emissions of ozone precursor pollutants (VOCs and NO<sub>x</sub>) were calculated for the deconstruction associated with the Proposed Action using the *US Air Force Conformity Applicability Model (ACAM) 4.3.3*. Calculations showed no emissions of the ozone precursor pollutants.

The Proposed Action would not involve open burning.

No new stationary air emission sources are associated with the deconstruction of the four buildings, so there would be no revisions to LaRC's Stationary Source Permit to Operate from the Virginia DEQ. LaRC would ensure that all activities associated with deconstruction activities would comply with the Federal Clean Air Act as enforced by the Virginia State Implementation Plan and the State Air Control Board (Code of Virginia § 10-1.1300). Therefore the Proposed Action would be consistent with the enforceable air management policies of the Coastal Zone Management Act. As such, implementation of the Proposed Action would result in minimal impact on air quality at LaRC.

### 4.8.2 Alternative

Under the Alternative, Building 582 would not be transferred to LAFB and it would be deconstructed along with the other four LTPT Complex facilities. Impacts to air quality in the area would be the same as under the Proposed Action.

### 4.8.3 No-Action

Under the No-Action alternative, LaRC would not transfer or deconstruct the LTPT Complex facilities, and there would be no change in air quality in the area around the LTPT Complex.

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## 4.9 WATER RESOURCES

### 4.9.1 Proposed Action

The transfer of Building 582 to LAFB would not impact water resources in the area around the LTPT Complex. The deconstruction of the other four buildings would result in minimal impact to the water resources in the area. Soil disturbance during deconstruction activities would produce a minor and temporary increase in suspended solids in the storm water reaching the Back River. In accordance with Virginia's Department of Conservation and Recreation (DCR), construction activities at LaRC that disturb equal to or greater than 4,047 square meters (one acre) require coverage under the General Permit for Discharges of Stormwater From Construction Activities. Additionally, since LaRC is within a Chesapeake Bay Preservation locality, construction activities larger than 232 square meters (2,500 square feet) also require coverage. Silt fences, storm drain inlet and outlet protection, and other appropriate standard construction practices would be implemented in accordance with the erosion and sediment control requirements of Virginia's DCR. Additionally, NASA LaRC would ensure that the contractors obtain the appropriate permits and prepare the required plans in accordance with DCR's construction site stormwater permit requirements. Following completion of the deconstruction, there would be no long-term impact to the quality or quantity of stormwater drainage to local surface waters.

The Virginia Coastal Zone Management Program maintains enforceable policies related to point source and non-point source water pollution. The Proposed Action does not involve point source water pollution, but does have the potential to generate a non-point water pollution source. The Coastal Zone Management Program requires that soil-disturbing projects be designed to reduce soil erosion and to decrease inputs of chemical nutrients and sediments to the State's waters. By contract, LaRC would require contractors to adhere to the standards of LaRC's current General Permit for Storm Water Discharges from Small Municipal Separate Storm Sewer Systems that requires LaRC to implement Best Management Practices (BMPs) mitigating stormwater pollution from Center activities. These BMPs include employee training, preventive maintenance, visual inspections, spill prevention and response, sediment and erosion control, good housekeeping, and record keeping and reporting. Since LaRC would implement appropriate BMPs to reduce erosion and pollution, the Proposed Action would be consistent with the Coastal Zone Management Program.

The entire LTPT Complex is located in the 100-year or 500-year floodplains. Deconstruction activities would comply with provisions of Executive Order 11988, *Floodplain Management*, and the Chesapeake Bay Preservation Act. Since structures built within the floodplains are at increased risk for loss due to flooding, the removal of the buildings would reduce LaRC's vulnerability to natural disaster. In addition, deconstruction would reduce the hindrance of natural flood flow and entrainment of debris. As such, implementation of the Proposed Action would result in minor impacts to water resources in the area around the LTPT Complex.

### 4.9.2 Alternative

Under the Alternative, Building 582 would not be transferred to LAFB and it would be deconstructed along with the other four LTPT Complex facilities. Impacts to water resources would be the same as under the Proposed Action with the exception that removal of Building 582

would further reduce LaRC's vulnerability to flooding and increase flow and drainage within the area.

#### 4.9.3 No-Action

Under the No-Action alternative, LaRC would not deconstruct or transfer the LTPT Complex facilities and they would remain in the floodplain. They would continue to impede natural flood flow and entrainment of debris. As such, implementation of the No-Action alternative could result in a minor negative impact to the water resources in the area around the LTPT Complex.

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## 5.0 CUMULATIVE EFFECTS

The CEQ regulations require that all Federal agencies include cumulative impacts in their environmental analyses (40 CFR 1508.25(c)). Cumulative impacts are defined as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions" (40 CFR 1508.7). This includes those that may be "individually minor but collectively significant actions taking place over time" (40 CFR 1508.7).

Cumulative effects are most likely to arise when a relationship exists between a proposed action and other actions expected to occur in a similar location or during a similar time period. Actions overlapping with or in close proximity to the proposed action would be expected to have more potential for a relationship than actions that may be geographically separated. Similarly, actions that coincide, even partially, in time would tend to offer a higher potential for cumulative effects. The scope of the cumulative impacts analysis involves both the geographic extent of the effects and the timeframe in which the effects could be expected to occur.

The geographic extent for the environmental resources analyzed in this EA is limited to the local LaRC East Area because the region of influence for potential environmental impacts from the proposed project is largely confined within the footprint of the LTPT Complex on LAFB property. The timeframe includes recent past and present actions continuing into the foreseeable future. An effort has been made to generally identify actions that are being considered and that are in the planning phase at this time.

### 5.1 PAST, PRESENT AND REASONABLY FORESEEABLE ACTIONS

As an active research facility, LaRC undergoes continual change in order to align its capabilities with the Agency's overall mission. Like any major research installation, LaRC requires new construction, facility improvements and infrastructure upgrades to ensure the Center's resources are appropriate for carrying out its research. Many of LaRC's recent past, present and foreseeable future actions are related to an overarching NASA objective to streamline the Center's infrastructure and restructure and modernize the Center's facilities. To meet NASA's developing mission requirements, LaRC continues to pursue projects that transform the Center into a more modern, efficient, and technologically advanced Center. Given the age of LaRC's infrastructure and the changes in NASA's mission, many facilities have outlived their useful life and require extensive renovation or demolition. The projects below comprise the major past, present, and reasonably foreseeable future actions at NASA LaRC.

Between 2004 and 2006, LaRC demolished fourteen dilapidated and abandoned buildings in order to reduce the Center's unneeded and unused infrastructure. In 2008, LaRC began deconstruction of thirteen smaller buildings and structures located throughout the Center. The facilities are under-utilized and no longer needed to support LaRC's mission. Deconstruction activities are on-going. Also in 2008 LaRC deconstructed Building 1212B, the 7x10-Foot High Speed Tunnel. NASA closed the facility in 1994 due to lack of need and because duplicate or superior testing capabilities exist at other NASA facilities.

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In the summer of 2009, LaRC began construction of a Hydro-Impact Basin at the Landing and Impact Research Facility (LandIR), Building 1297. The project will allow for full-scale water-impact testing for simulated Orion Crew Exploration Vehicle (CEV) ocean splashdown research in support of NASA's Constellation Program.

Beginning in the fall of 2009 and continuing over the next 15 years, LaRC plans to implement a major five-phase modernization and upgrade project called New Town. Site improvements would include construction of five new buildings, the renovation of two existing buildings, and the deconstruction of an additional 22 abandoned and unneeded buildings; as well as upgrades to roadwork, parking lots, and utilities. The project would modernize the center core of LaRC, better align LaRC's capabilities with the future direction of the NASA mission, and significantly reduce the Center's operations and maintenance costs. This initiative would remove aging and inefficient facilities to be replaced by modern offices and research laboratories. The new facilities and modifications to existing facilities would meet the Leadership in Energy and Environmental Design (LEED) silver standards for building design.

Also in the fall of 2009 and continuing into 2011, 21 buildings that are abandoned or in the process of being closed will be deconstructed in order to further reduce unneeded, unused structures at LaRC and allow for more resources to be directed towards LaRC's overall mission.

Beginning in 2010, LaRC is planning to deconstruct four closed wind tunnels. The facilities are Building 640 (the 8-Foot Transonic Pressure Tunnel), Building 641 (the 8-Foot High Speed Tunnel), Building 643 (the Full Scale Tunnel), and Building 1146 (the 16-Foot Transonic Tunnel). The decision to deconstruct the facilities is based on the determination of no current or future government need to use the tunnels and no viable plans from non-governmental entities (industry, universities, etc.) to operate or adaptively reuse the facilities.

As described in Section 1.3 the Agency's evolving mission, especially the Constellation Program to return humans to the moon could continue to affect the activities and operations at the NASA field centers. LaRC's contribution to the Constellation project including leading the Launch Abort System integration project requires the introduction of various new research and development activities at the Center. The current and reasonably foreseeable activities that would occur at LaRC in support of Constellation would be similar to ongoing research activities conducted at LaRC in support of existing programs.

Other past, present, and reasonably foreseeable actions occurring in the general geographic vicinity of the LTPT include those conducted by LAFB. Like other military installations, LAFB requires facility and infrastructure streamlining, improvements and upgrades, as well as new construction in order to best carry out its mission. LAFB demolished a number of unneeded facilities and structures in 2006 and 2007. Two security gates were also reconstructed.

Recent actions by LAFB include mechanical and utility upgrades to various existing structures and the construction of several new support facilities. LAFB is also currently in the process of repairing and renovating its hurricane-damaged buildings.

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LAFB has proposed redevelopment for portions of the base and the deconstruction of obsolete facilities to be completed by FY 2012. Additional actions proposed by LAFB which will occur in the southern portion of the base include the replacement of aircraft and fuel systems maintenance hangars. The construction of new personnel dormitories, an operations center for LAFB security forces and family support buildings have also been proposed (LAFB 2009).

## 5.2 ANALYSIS OF CUMULATIVE IMPACTS

The following analysis examines the impacts on the environment that could result from the incremental impact of the Proposed Action when added to the actions described above. The analysis examines whether such a relationship would result in potentially significant impacts not identified when the Proposed Action is considered alone.

With the exception of cultural resources, LaRC has determined that the projected effect of the Proposed Action, coupled with the other past, current and future actions described above, would result in minimal cumulative impacts to the resources analyzed in this EA.

LaRC has determined that the projected cumulative effect of the Proposed Action, coupled with the other past, current and future actions occurring at LaRC would be the loss of LaRC's historic properties. The impacts would be caused by the removal or modification of historic properties and the potential change in the character and/or integrity of the proposed NASA LaRC Historic District. In accordance with Section 106 of the National Historic Preservation Act, LaRC plans to minimize the impacts to historic properties through consultation with the SHPO and carrying out appropriate mitigation measures to preserve LaRC's history and legacy to the maximum extent practical. While the resources once removed would be lost, the history of the facilities would be preserved through mitigation measures, as described in Section 4.3.1.1.

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## 6.0 REFERENCES

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## 7.0 LARC PREPARERS AND CONTRIBUTORS

The LaRC Environmental Management Branch prepared this EA. Individuals listed below contributed to the completion of the document by writing portions of the text, contributing background and supporting information, or providing technical review/comment on the draft.

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## **APPENDIX A**

### **Consultation and Correspondence with Outside Agencies**

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Scoping Letter

National Aeronautics and  
Space Administration  
**Langley Research Center**  
Hampton, VA 23681-2199



August 13, 2009

Reply to Attn of: 213

Jim Oliver  
Hampton City Manager  
22 Lincoln Street  
8<sup>th</sup> Floor City Hall  
Hampton, VA 23669

Dear Mr. Oliver:

The National Aeronautics and Space Administration's Langley Research Center (NASA LaRC) has several of its wind tunnel facilities proposed for deconstruction. Among those being considered are the Low Turbulence Pressure Tunnel (LTPT) complex which also includes the 16-inch and 6 by 28-inch Transonic Tunnel Facility and the 6-inch by 19-inch Transonic Tunnel Facility. The facilities are abandoned and NASA has determined they are no longer needed. The project is intended to reduce the Center's infrastructure and allow LaRC to direct limited resources towards facilities that support NASA's overall mission, both currently and in the future. Deconstruction activities would include the dismantling and extracting of reusable and recyclable materials prior to the removal of the buildings.

The facilities are located on land leased from Langley Air Force Base. Since NASA LaRC has determined that the facilities are potentially eligible for the National Register of Historic Places, we plan to consult with the Virginia State Historic Preservation Office (SHPO) and the Advisory Council on Historic Preservation (ACHP) regarding the proposed deconstruction. On past similar projects, the SHPO and ACHP have stressed that NASA must explore alternatives to deconstruction, such as adaptive reuse or operated by a third party.

In order to address their concerns, NASA requests your assistance in exploring alternatives to deconstruction of the facilities. We would like to know if the City of Hampton would consider operating and maintaining the wind tunnels or finding some other alternative use for the facilities. Enclosed is a location map and photographs of the facilities for your review. Additional information on the facilities is available at <http://gis.larc.nasa.gov/historic/larc>.

We appreciate your feedback and any other ideas you may have regarding alternatives. We request your response by September 7, 2009.

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Please feel free to contact Ms. Mary Gainer, the LaRC Cultural Resource Specialist at 757-864-7762 or [mary.e.gainer@nasa.gov](mailto:mary.e.gainer@nasa.gov) if you have any questions regarding this request.

Cordially,



Rodney T. Harris  
Chief Architect  
Center Master Planner  
Historic Preservation Officer

Enclosures

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NASA LaRC LTPT Deconstruction and Transfer  
Scoping Letter Distribution List

July 2009

National Institute of Aerospace	Robert Lindberg President 144 Research Drive Hampton, VA 23666
City of Hampton	Mr. James Oliver City Manager 22 Lincoln Street Hampton, VA 23669
Hampton Roads Planning District Commission	Dwight L. Farmer Executive Director 723 Woodlake Drive Chesapeake, VA 23320
City of Poquoson	Mr. Charles W. Burgess, Jr. City Manager 500 City Hall Ave. Poquoson, VA 23662
Virginia Air and Space Center	Mr. Todd C. Bridgford Executive Director 600 Settlers Landing Rd Hampton, VA 23669
Old Dominion University	Dr. John R. Broderick President Old Dominion University Norfolk, VA 23529
Old Dominion University	Dr. Oktay Baysal, Dean Frank Batten College of Engineering and Technology 102 Kaufman Hall Norfolk, VA 23529
Hampton History Museum	Ms. Bethany Austin 120 Old Hampton Lane Hampton, VA 23669
Hampton University	Dr. Morris H. Morgan, III Olin Engineering Building, Suite 117 168 Marshall Avenue Hampton, VA 23668

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Response from the City of Hampton



City Manager

August 28, 2009

Mr. Rodney T. Harris  
Chief Architect  
Center Master Planner  
Historic Preservation Officer  
NASA Langley Research Center  
Hampton, VA 23681-2199

Dear Mr. Harris:

Thank you for the opportunity to explore alternative uses for the Low Turbulence Pressure Tunnel (LTPT) complex located on Langley Air Force Base (LAFB). As you know the City of Hampton has had an outstanding relationship with NASA LaRC as well as with LAFB for over 90 years and its growing stronger every day. We have enjoyed the many successes NASA LaRC has achieved and are proud of its rich history.

While NASA LaRC has determined that the subject (LTPT) complex is a candidate for the National Register of Historic Places we can also appreciate the significant challenges and costs associated to refurbish and sustain such facilities. It is our understanding that the facilities are in serious need of repair and the cost to make them habitual or useful is in the millions of dollars. Furthermore we understand that LAFB has security and flooding concerns regarding the LTPT complex. Based upon the myriad of complicated issues surrounding a local city government taking any role in operating or maintaining such facilities, like the LTPT complex on federally owned land, we are not in a position to address alternative uses of these assets. The fiscal realities and budgetary challenges we face with providing the core city services to our citizens further amplifies the fact that it would not be feasible for us to pursue ownership or use these particular facilities.

Again we appreciate you considering the City of Hampton as you decide the final course of action regarding the LTPT complex. The City of Hampton is very excited about the future of NASA LaRC and we look forward to supporting you as you continue to provide vital research and innovative advancements in the various missions the center is involved in. Please feel free to contact me or Bruce Sturk, Director of Federal Facilities Support at [bsturk@hampton.gov](mailto:bsturk@hampton.gov) or by phone at 727-6102 if you have further questions.

Sincerely,

James B. Oliver, Jr.  
City Manager

CITY OF HAMPTON (757) 727-6392 FAX (757) 728-3037  
22 LINCOLN STREET, HAMPTON, VIRGINIA 23669

*"Oldest Continuous English-Speaking Settlement in America - 1610"*



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Correspondence with LAFB

National Aeronautics and  
Space Administration  
  
**Langley Research Center**  
Hampton, Virginia 23681-0001



July 24, 2009

Reply to Attn of: 106

Colonel Matthew H. Malloy  
Commander, First Fighter Wing  
159 Sweeney Blvd, Suite 200  
Langley AFB VA 23665-2291

Dear Colonel Malloy:

NASA Langley Research Center (LaRC) has identified five of our facilities located on Langley Air Force Base (LAFB) property as potential demolition candidates. The facilities are Buildings 582, 582A and 585 (Low Turbulence Pressure Tunnel Complex), and Buildings 583 and 583A (16-Inch and 6 x 28-Inch Transonic Tunnel and Storage Facility). The location of the facilities is shown in Figure 1. The facilities occupy approximately 0.56 acres of land that is part of a 1939 land use agreement between LAFB and NASA. The agreement stipulates that NASA return the property to LAFB in a condition satisfactory to you, should NASA no longer have a need to use, operate or maintain the facilities. NASA intends to comply with this requirement by demolishing these facilities and relinquishing to you the land these facilities currently occupy.

The LTPT Complex and the 16-Inch and 6 x 28-Inch Transonic Tunnel were closed by NASA in 2006 and 1996, respectively, because they were under-utilized and no longer needed to perform mission critical research. NASA plans to demolish the facilities in order to reduce our infrastructure and to focus limited funding on current and future research initiatives. This action is particularly significant now as NASA undergoes fundamental transformation in both business practices and mission.

All of the facilities are located within, and are contributing elements to, two proposed historic districts: Langley Field Historic District and the NASA LaRC Historic District. Accordingly, they are potentially eligible for listing in the National Register of Historic Places. In order to comply with the Section 106 requirements of the National Historic Preservation Act, NASA LaRC intends to consult with the Virginia Department of Historic Resources (VDHR) and the Advisory Council on Historic Preservation (ACHP) regarding the proposed demolition of these facilities.

In the past, both VDHR and the ACHP have stressed that NASA should explore alternatives to demolition, such as adaptive reuse, heritage tourism or mothballing. In order to help address their concerns, we request that you provide your written input and comments concerning the feasibility of mothballing the facilities, turning them into heritage/tourism sites that would be available to the general public, or some other alternative use for the facilities (e.g., transfer of ownership to LAFB

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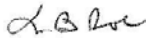
2

for use as office space or other use). If these alternatives are not compatible with the Air Force's current or foreseeable requirements, please provide us with your comments to assist us in documenting the decision.

My point of contact for this matter is Ms. Mary Gainer, LaRC's Cultural Resource Specialist, who can be reached at 864-7762, Mail Stop 213, or [mary.e.gainer@nasa.gov](mailto:mary.e.gainer@nasa.gov). Please feel free to have your counterparts contact her if you have questions regarding this matter.

We appreciate your attention and assistance in this matter and look forward to working with you to reach a mutually satisfactory decision.

Sincerely,



Lesa B. Roe  
Director

Environmental Assessment for Deconstruction and Transfer of  
Low-Turbulence Pressure Tunnel Complex Facilities

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Figure 1 – Location of NASA LaRC Facilities Proposed for Demolition

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LaRC letter, to Malloy; LBRoe, dated 7/16/09

cc:

223/COD

213/M.E.Gainer

223/R.T.Harris

223/RTHarris: rth 07/16/09 (46118)

223/GBE 

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Response from LAFB



DEPARTMENT OF THE AIR FORCE  
HEADQUARTERS 1ST FIGHTER WING  
LANGLEY AIR FORCE BASE VA

14 SEP 2009

OFFICE OF THE COMMANDER  
159 SWEENEY BLVD SUITE 200  
LANGLEY AFB VA 23665-2291

Ms. Lesa B. Roe  
Director, National Aeronautics and Space Administration (NASA)  
Langley Research Center  
100 NASA Road  
Hampton VA 23681-2199

Dear Ms. Roe

This letter is in response to your 24 Jul 09 correspondence regarding five NASA Langley Research Center-owned facilities located at Langley Air Force Base (LAFB).

After examining the facilities in question, we feel we can provide constructive remarks on potential demolition alternatives. Although we cannot comment on the feasibility of mothballing the facilities to meet the future needs of NASA, we believe that mothballing these facilities for future Air Force use is impractical. These buildings served a very specialized purpose during their lifetime (i.e. wind tunnel research), and we cannot foresee a situation where the revival of this type of facility would be required by our future mission.

We have concerns about any proposal that converts these facilities into a museum or heritage tourism site. Military security requirements render these buildings, located in the heart of LAFB, difficult to open to the general public. Development of a museum would carry with it substantial costs (e.g. parking improvements/shuttle access) which we cannot currently fund. Additionally, use of facilities on military installations as museums requires approval by the Secretary of the Air Force; such museums must be consistent with the mission of the Air Force Museum Program, and because this museum would likely discuss NASA history, it is outside the realm of what is authorized by the Air Force History and Museum Program. Overall, the museum functions that could be appropriately housed in these facilities would be severely limited by cost considerations and, most importantly, security concerns.

Although most of the complex proposed for demolition cannot be adaptively reused to support the current or anticipated Air Force mission, we are interested in discussing a transfer of Facility 582, the two-story administrative building fronting Thornell Avenue. We believe this facility could be renovated to help alleviate the office space shortage we always experience in this area of the base. If you believe such a transfer is possible, we ask that your engineers check the feasibility of leaving this building intact, while demolishing the adjacent wind tunnel (582A) and the other facilities in the complex. We also ask that your engineers work with our engineers on any details associated with the project, such as interior demolition requirements in 582 and the issue of closing the connection between 582 and 582A prior to or immediately after demolition.

*Global Power For America*

Environmental Assessment for Deconstruction and Transfer of  
Low-Turbulence Pressure Tunnel Complex Facilities

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As you know, we have Air Force employees currently working in Facility 583A. As the demolition scope becomes more firm over the next few months, please have your personnel keep our 1 CES Real Property Officer informed of the schedule. We will need to find space for these people elsewhere on base prior to demolition.

We hope that this response provides adequate information for your final decision. We look forward to working with you on a potential transfer of Facility 582. Should you have any questions or comments, please feel free to contact my representative Ms. Brenda Cook, Deputy Base Civil Engineer, at 757-764-2025 or [brenda.cook@langley.af.mil](mailto:brenda.cook@langley.af.mil).

Sincerely



MATTHEW H. MOLLOY, Colonel, USAF  
Commander



Environmental Assessment for Deconstruction and Transfer of  
Low-Turbulence Pressure Tunnel Complex Facilities

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**Public Notice**

Published in the *Daily Press* on August 23, 2009

Notice is hereby given that the National Aeronautics and Space Administration's Langley Research Center (NASA LaRC), located in Hampton, Virginia, is planning to deconstruct the Low Turbulence Pressure Tunnel (LTPT) Complex which includes Buildings 582, 582A, 583, 583A and 585. The buildings, which are located on land leased from Langley Air Force Base, are abandoned and NASA has determined they are no longer needed. Deconstruction activities would include the dismantling and extracting of reusable and recyclable materials prior to the removal of the buildings. The proposed project is intended to reduce the Center's infrastructure and allow LaRC to direct limited resources towards facilities that support NASA's overall mission, both currently and in the future. NASA has determined that the LTPT complex is eligible for listing in the National Register of Historic Places (NRHP) and that the project will adversely affect the historic properties. NASA plans to consult with the Virginia State Historic Preservation Office, the Advisory Council on Historic Preservation, and other parties as appropriate, to mitigate the adverse effects of the deconstruction activities. Mitigation measures would include documenting the buildings according to standards and guidelines established by the Secretary of the Interior and the Virginia Department of Historic Resources, as well as providing public access to the LaRC historic preservation website: <http://gis.larc.nasa.gov/historic/resources/>. Any comments regarding this project must be submitted in writing within 30 days of this notice to: Ms. Mary Gainer, NASA LaRC Cultural Resources Specialist, MS 213, Hampton, Virginia, 23681; email [mary.e.gainer@nasa.gov](mailto:mary.e.gainer@nasa.gov).



Environmental Assessment for Deconstruction and Transfer of  
Low-Turbulence Pressure Tunnel Complex Facilities

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VDHR Consultation Letter

National Aeronautics and  
Space Administration  
**Langley Research Center**  
Hampton, VA 23681-2199



October 6, 2009

Reply to Attn of: 213

Mr. Ronald Grayson  
Archaeologist, Office of Review and Compliance  
Virginia Department of Historic Resources  
2801 Kensington Avenue, Richmond VA 23221

SUBJECT: Deconstruction of Facilities Associated with the LTPT Complex at NASA Langley Research Center, Hampton, Virginia, VDHR File # 2009-1359

Dear Mr. Grayson,

In accordance with 36 CFR § 800.6, regulations implementing Section 106 of the National Historic Preservation Act of 1966, as amended (NHPA), the National Aeronautics and Space Administration, Langley Research Center (NASA LaRC) is consulting with your office regarding the proposed deconstruction of facilities associated with the Low-Turbulence Pressure Tunnel (LTPT) Complex at NASA LaRC. The proposed undertaking involves the following buildings located in NASA LaRC's East Area on Langley Air Force Base (LAFB) property:

- Building 582A – LTPT Tunnel Circuit (#114-0165-0357)
- Building 583 – 16 inch and 6 by 28 inch Transonic Tunnel (#114-0165-0372)
- Building 583A – 16 inch and 6 by 28 inch Transonic Tunnel Storage (#114-0165-0112)
- Building 585 – 6-Inch by 19-Inch Transonic Tunnel Facility (#114-1065-0373)

**Purpose and Description of Undertaking**

The purpose of the proposed undertaking is to streamline NASA LaRC's infrastructure by removing facilities from the Center's real property inventory that are no longer operational and/or needed to support NASA's critical mission. This action is needed to allow NASA LaRC to direct limited funding towards the maintenance and operation of facilities that support the Agency's overall mission, currently and in the future. Funds for general maintenance and operation of facilities at NASA LaRC are provided by the various projects and programs utilizing the facility space. Since the five facilities associated with the LTPT Complex are closed and abandoned, no direct funding sources exist for their continued maintenance and upkeep. Buildings 583, 583A and 585 were closed by NASA LaRC in 1996 and 582A was closed in 2006.

The proposed undertaking consists of the deconstruction of Buildings 582A, 583, 583A and 585. Deconstruction activities will begin in 2010 and continue through 2012. The term "deconstruction" as opposed to demolition, would include the dismantling and extracting of reusable and recyclable materials prior to the destruction/removal of the buildings. Materials extracted from the buildings



## Environmental Assessment for Deconstruction and Transfer of Low-Turbulence Pressure Tunnel Complex Facilities

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such as concrete, brick, steel structural elements and other metals would be recycled to the maximum extent possible.

NASA has determined that Buildings 582A, 583, 583A and 585 are potentially eligible for listing in the National Register of Historic Places (NRHP) as contributing resources to the proposed LaRC Historic District. NASA has determined that Building 582A is potentially eligible for listing in the NRHP both individually, and as contributing resource to the historic district under Criterion A for its association with early advances in aeronautics research and testing by the NACA and NASA LaRC.

### Assessment of Adverse Effect

In accordance with 36 CFR § 800.5(a), NASA LaRC has applied the criteria of adverse effect to the proposed undertaking and has determined that the proposed undertaking will have an adverse effect on Buildings 582A, 583, 583A and 585. In a letter dated August 24, 2009, NASA LaRC notified the Advisory Council on Historic Preservation (ACHP) of its finding of potential adverse effect in accordance with 36 CFR § 800.6(a)(1) and invited their participation in the consultation. The ACHP declined participation in a letter dated September 10, 2009 (copy included as Attachment 1).

### Area of Potential Effect

The LTPT Complex facilities are located in the NASA LaRC East Area. The area of potential effect (APE) for the proposed undertaking includes the building footprint for each of the buildings proposed for deconstruction, as well as, the immediate area surrounding the buildings where ground disturbing activities are likely to occur. The APE for the proposed undertaking is shown in Figure 1.



Figure 1 – Area of Potential Effect

## Environmental Assessment for Deconstruction and Transfer of Low-Turbulence Pressure Tunnel Complex Facilities

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### Description of the Potentially Eligible Buildings

The LTPT Complex facilities were previously surveyed at the reconnaissance level the results of which are reported in the documents entitled *Phase I Reconnaissance Survey of Architectural Resources at the National Aeronautics and Space Administration, Langley Research Center, Hampton, Virginia, Volume I: Technical Report, and Addendum, VDHR FILE # 2006-1634* (Dutton et al. 2008 and 2009). The reconnaissance survey findings for the LTPT Complex facilities are summarized below.

114-0165-0357



#### Building 582A

**Address:** 582A Thornell Avenue

**Construction Date:** 1940

**DHR Time Period:** World War I to  
World War II (1917-1945)

**Property Name:** Low-Turbulence Pressure Tunnel

**Property Type:** Testing Facility

**Eligibility:** Contributing A

**DHR Historical Context:** Military/Defense,  
Technology/ Engineering Theme

**Setting and Description:** Building 582A was added to the north end of Building 582 in 1940. A concrete sidewalk extends the length of the facade and is separated from the street by a narrow grass strip that is planted with widely spaced young trees. The sidewalk is separated from the building by a narrow lawn and there are widely spaced mature shrubs at the building. A concrete sidewalk extends from the entry at the north end of the building and intersects the public walk near the street.

Constructed in 1940, Building 528A is a two-story, eleven-bay wide Stripped Classicism-style building constructed of pressed brick laid in a five-course American bond pattern. The facade is organized by two main blocks – a slightly recessed eight bay section and a three-bay section that forms an entrance feature similar in composition to Building 582. The eight-bay section is composed of stacked two-part, four-light anodized aluminum windows that are organized vertically by a recessed panel. The smaller lower sash of the windows is operable. The windows have cast stone sills, the first story windows have soldier course lintels and the second story windows have four-course corbelled lintels that step out to the wall plane. There is a cast stone belt course between the window heads and the cast stone coping at the parapet. The three northern bays are slightly projected and form a three-part entrance block similar to Building 582. The slightly projected, centered entrance bay has a shallow front gable roof that rises above the flanking flat parapets. The parapets, both flat and raked, are edged with a cast stone coping. The entrance is composed of a double-leaf glass and aluminum door with a narrow transom and a cast stone lintel above. At the second story is a two-part, four-light anodized aluminum window. The smaller lower sash of the window is operable. There is a cast stone cartouche above the window bearing the NACA symbol. Flanking the entrance, are stacked two-part, four-light anodized aluminum windows that are organized vertically by a

## Environmental Assessment for Deconstruction and Transfer of Low-Turbulence Pressure Tunnel Complex Facilities

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recessed panel. The smaller lower sash of the windows is operable. The windows have cast stone sills, the first story windows have soldier course lintels and the second story windows have four-course corbelled lintels that step out to the wall plane. There is a cast stone belt course between the window heads and the parapet on the recessed flanking bays.

The closed-loop Low Turbulence Pressure tunnel is located to the north and west of the brick office and support building (582 and 582A). The tunnel is constructed of welded steel plates with exterior transverse standing steel ribs that reinforce the steel skin of the oval shaped tunnel circuit.

**Eligibility:** Building 582A, a component of the Low-Turbulence Pressure Tunnel, has been evaluated both as an individual resource and as a contributing resource to a historic district. Issues of significance, integrity, and boundaries were considered.

Building 582A is potentially eligible for listing in the National Register as a single resource and as a contributing resource to a historic district under Criterion A for its association with advances in aerodynamics research and testing conducted by NACA and NASA LaRC.

Building 582A is not associated with the life of a person significant in the past and is not potentially eligible under Criterion B. The building lacks architectural and engineering distinction and is not considered potentially eligible under Criterion C. Further, the building does not have the potential to contain information important in prehistory or history and is therefore not eligible under Criterion D.

Building 582A retains its integrity of location, design, setting, workmanship, feeling, and association. It lacks integrity of materials due to building modifications through time.



Environmental Assessment for Deconstruction and Transfer of  
Low-Turbulence Pressure Tunnel Complex Facilities

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114-0165-0372

**Building 583****Address:** 583 Plumb Street**Construction Date:** 1938**DHR Time Period:** World War I to  
World War II (1917-1945)**Property Name:** 16 Inch & 6x28 Transonic Wind  
Tunnel Facility**Property Type:** Research Facility/Laboratory**Eligibility:** Contributing**DHR Historical Context:** Military/Defense,  
Technology/Engineering

**Setting and Description:** This building is located in the NASA LaRC East Area on the south side of an alley between Hunting Avenue and Thornell Avenue. The NASA LaRC East Area is within the boundaries of Langley Air Force Base and represents the earliest development of NASA LaRC. The East Area exhibits a dense urban pattern of development with the majority of buildings being set close to the roads, which are arranged in a grid pattern. The area features sidewalks, mature trees and landscaping, and little open space. This building is adjacent and connected to the east side of Building 583A. A wind tunnel is located to the east of the building and a parking lot is located to the rear.

This two-story building was constructed in 1938 and houses the Transonic Wind Tunnel which originally functioned as the Ice Tunnel. It has a rectangular form and the masonry structural system is clad with red brick laid in a 5:1 American Bond. The building rests on a continuous concrete foundation and is topped by a gambrel roof covered with corrugated metal and features a front gabled parapet with concrete coping. Fenestration includes large industrial style metal casement windows. The front facade features a central garage bay flanked by large window openings and is divided by brick pilasters with concrete caps. The side façade is divided into recessed panels topped with four-course corbelled brick lintels and bordered by brick pilasters.

**Eligibility:** This building is an example of a specialized wind tunnel research facility in the NASA LaRC East Area. This resource has been evaluated both as a contributing resource to a potential historic district and as an individual resource. Issues of significance, integrity, and district boundaries were taken into consideration.

This Building currently houses the 16 inch & 6x28 Transonic Wind Tunnel. It was initially constructed in 1938 for the purpose of studying the effects of ice on aircraft parts. NACA's real interest in the facility was to create a prototype tunnel with low-turbulence levels. Soon after its construction and several icing tests, NACA removed the ice equivalent portions of the tunnel and converted the facility into the Two-Dimensional Low-Turbulence Pressure Tunnel. This facility became the site of extensive tests of low-drag airfoils and was the model for the Low-Turbulence Pressure Tunnel constructed in the adjacent building. In 1947 the Two-Dimensional Low-Turbulence

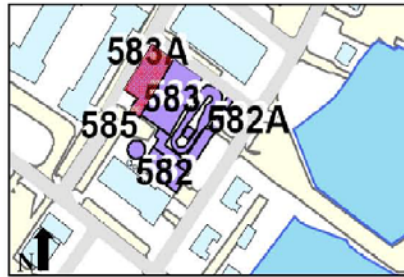
## Environmental Assessment for Deconstruction and Transfer of Low-Turbulence Pressure Tunnel Complex Facilities

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Pressure Tunnel was dismantled and replaced by the Transonic Blowdown Tunnel. This tunnel was used for flutter testing of wings for the majority of military fighter planes throughout the 1950s. The facility allowed Mach number, angle of attack, and stagnation pressure to be independently controlled so that data could be obtained at a constant Reynolds number.

This resource represents a significant research facility at NASA LaRC from its construction through the modern period and retains a high degree of historic physical integrity. It is representative of the significant advances in aeronautics and aerospace research and wind tunnel design that took place at NASA LaRC, and makes the NASA LaRC Historic District potentially eligible for listing in the NRHP under Criteria A and C. This resource is considered a contributing resource to the historic district.

**114-0165-0112**



**Building 583A**

**Address:** 583A Plumb Street

**Construction Date:** 1929

**DHR Time Period:** World War I to  
World War II (1917-1945)

**Property Name:** 16 Inch & 6x28 Transonic Wind  
Tunnel Storage

**Property Type:** Storage Facility

**Eligibility:** Contributing

**DHR Historical Context:** Military/Defense,  
Technology/Engineering

**Setting and Description:** This building is located in the NASA LaRC East Area on the east side of Hunting Avenue between Plumb Street and Thompson Street. The NASA LaRC East Area is within the boundaries of Langley Air Force Base and represents the earliest development of NASA LaRC. The East Area exhibits a dense urban pattern of development with the majority of buildings being set close to the roads, which are arranged in a grid pattern. The area features sidewalks, mature trees and landscaping, and little open space. This building is adjacent and connected to the west side of Building 583. Hunting Avenue flanks the west side of the building and an alley extends by the front façade. A parking lot is located to the rear.

This one-story building was constructed in 1929 and serves as storage for the Transonic Wind Tunnel Facility in the adjacent building. It has a rectangular form and the masonry structural system is clad with red brick laid in a 6:1 American Bond. The building rests on a continuous concrete foundation and is topped by a gable roof covered with corrugated metal and features a front gabled parapet. The main entrance is located on the west side and consists of a single door in a non-original opening, sheltered by a cantilevered metal canopy. The front facade features a large recessed panel topped by a four-course corbelled brick lintel and bordered by brick pilasters on the corners of the building. A garage bay is located centrally and flanked by two large window openings. The side façade is divided

## Environmental Assessment for Deconstruction and Transfer of Low-Turbulence Pressure Tunnel Complex Facilities

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into recessed panels with similar lintels and pilasters. Each panel contains a large window opening. Many of the openings appear to have originally had large casement windows, but now have two sets of metal windows with a fixed pane over an awning sash divided by brick infill. A one-story flat roof brick addition has been appended to the rear as well.

**Eligibility:** This building is an example of a wind tunnel support facility in the NASA LaRC East Area. This resource has been evaluated both as a contributing resource to a potential historic district and as an individual resource. Issues of significance, integrity, and district boundaries were taken into consideration.

This Building serves as a storage facility for the adjacent 16 inch & 6x28 Transonic Wind Tunnel. It was initially constructed in 1929 as a general maintenance building, however was adapted to function as a support facility for Building 583, the Ice Tunnel Research Facility when it was attached to the south side of this building in 1938. Soon after the construction of the Ice Tunnel and several tests, NACA removed the ice equivalent portions of the tunnel and converted the facility into the Two-Dimensional Low-Turbulence Pressure Tunnel. This facility became the site of extensive tests of low-drag airfoils and was the model for the Low-Turbulence Pressure Tunnel constructed in the adjacent building. In 1947 the Two-Dimensional Low-Turbulence Pressure Tunnel was dismantled and replaced by the Transonic Blowdown Tunnel. This tunnel was used for flutter testing of wings for the majority of military fighter planes throughout the 1950s. The facility allowed Mach number, angle of attack, and stagnation pressure to be independently controlled so that data could be obtained at a constant Reynolds number.

While this resource itself does not appear to be the site of significant research or events at NASA, it is associated with the former Ice Tunnel/Two-Dimensional Low-Turbulence Pressure Tunnel/Transonic Blowdown Tunnel Facility and is an important component of that resource. This resource retains a high degree of historic physical integrity and is associated with the significant advances in aeronautics and aerospace research and wind tunnel design that took place at NASA LaRC, and makes the NASA LaRC Historic District potentially eligible for listing in the NRHP under Criteria A and C. This resource is considered a contributing resource to this historic district.



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114-0165-0373

**Building 585***Address:* 585 Thompson Street*Construction Date:* 1934*DHR Time Period:* World War I to  
World War II (1917-1945)*Property Name:* 6x19 Inch Transonic Wind Tunnel*Property Type:* Research Facility/Laboratory*Eligibility:* Contributing*DHR Historical Context:* Military/Defense,  
Technology/Engineering

**Setting and Description:** This structure is located in the NASA LaRC East Area on the east side of Hunting Avenue between Plumb Street and Thompson Street. The NASA LaRC East Area is within the boundaries of Langley Air Force Base and represents the earliest development of NASA LaRC. The East Area exhibits a dense urban pattern of development with the majority of buildings being set close to the roads, which are arranged in a grid pattern. The area features sidewalks, mature trees and landscaping, and little open space. This structure is set in a grassy area to the rear of Building 582 and flanked by parking lots.

This structure was constructed in 1934 and functions as a Transonic Wind Tunnel. It has a cylindrical form and rests on a heavy poured concrete slab foundation. The wind tunnel structure itself is inside of the protective exterior structure which was added later. This protective sheathing consists of welded steel panels with full-height vertical ribbing that meet on top of the domed roof. There are five smaller metal tanks located to the south of this structure and are connected by a system of pipes.

**Eligibility:** This building is an example of a specialized wind tunnel research facility in the NASA LaRC East Area. This resource has been evaluated both as a contributing resource to a potential historic district and as an individual resource. Issues of significance, integrity, and district boundaries were taken into consideration.

This Building houses the 6x19 Inch Transonic Tunnel. It was initially constructed in 1934 as a 24 inch, high-speed blowdown test tunnel to improve on the similar 11 inch version already in use in Building 582. The test section of the 24 inch tunnel was oriented in a vertical position and equipped with a Schlieren photographic system to examine transonic phenomena such as shock waves at high speeds. It was the first tunnel at NASA LaRC to use this type of camera. In 1949, the welded metal outer enclosure was added to address problems with humidity and water-vapor condensation on the tunnel, and in 1952 the 24 inch test section was replaced with a slotted octagonal 22 inch test section.

In the late 1960s, interest in high-speed airfoils grew and in 1971, the 22inch tunnel was converted to a 6 by 19 inch two-dimensional tunnel using most of the existing hardware. The tunnel was capable of operations at Mach 0.5 to about 1.2, with extensive instrumentation in the form of surface oil flow

Environmental Assessment for Deconstruction and Transfer of  
Low-Turbulence Pressure Tunnel Complex Facilities

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of operations at Mach 0.5 to about 1.2, with extensive instrumentation in the form of surface oil flow photographs, schlieren flow photographs, integrated forces and moments, and surface-pressure distributions. Additionally, the facility was used to supply calibration data for the development of computer methods to analyze the effects of slotted walls on aerodynamic data.

**Public Notification and Consideration of Alternatives**

NASA LaRC sent scoping letters to various local agencies and outside organizations in order to solicit comments regarding the proposed undertaking. The letters requested assistance in exploring alternatives to deconstruction including possible adaptive reuse of the facilities. A sample letter and a copy of the distribution list for the letters are attached (Attachment 2). LaRC received a response from LAFB expressing interest in the transfer of ownership of Building 582 (the LTPT Tunnel Office Building) from NASA to LAFB for use as administrative office space. The City of Hampton responded that they currently are not in a position to address alternative uses of the LTPT Complex (Attachment 3). No other responses were received.

In accordance with the public involvement requirements of the 36 CFR 800, *Protection of Historic Properties* and NEPA, NASA LaRC invited public comment on the Proposed Action by publishing a notice in the legal section of the *Daily Press* on August 23, 2009. No comments were received from the public regarding the proposed deconstruction of the LTPT Complex.

**Proposed resolution of Adverse Effects**

In accordance with 36 CFR § 800.6(b)(1)(i), NASA LaRC proposes to resolve adverse effects associated with the proposed undertaking through execution of a memorandum of agreement (MOA) with your office. The enclosed draft MOA (Attachment 4) provides for recordation of the buildings in a manner similar to the standard documentation measures prescribed in the Programmatic Agreement we are currently developing with your office and the ACHP.

NASA LaRC requests that you review the Phase I reconnaissance survey data and concur with our determination that the five buildings associated with the LTPT Complex are potentially eligible for listing in the NRHP. Further, NASA LaRC requests that you review the draft MOA and provide any comments you may have to me electronically within 30 days or less of receipt of this letter. An electronic version of the draft MOA will be sent following this letter.

If you have any questions about the project documentation or the proposed mitigation as stipulated in the MOA, please do not hesitate to contact me at 757-864-7762. We look forward to your response.

Sincerely,



Mary Gainer  
Cultural Resource Specialist  
Acting Historic Preservation Officer



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Attachments

Environmental Assessment for Deconstruction and Transfer of  
Low-Turbulence Pressure Tunnel Complex Facilities

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ACHP Consultation Letter

National Aeronautics and  
Space Administration  
**Langley Research Center**  
Hampton, VA 23681-2199



August 24, 2009

ply to Attn of

213

Advisory Council on Historic Preservation (ACHP)  
Dr. Thomas McCulloch  
Historic Preservation Specialist  
1100 Pennsylvania Ave., NW, Ste. 803  
Washington, DC 20004

SUBJECT: Demolition of LTPT Complex at NASA Langley Research Center, Hampton, Virginia

Dear Dr. McCulloch,

The National Aeronautics and Space Administration (NASA) is proposing to demolish the following five buildings at Langley Research Center (LaRC) located in Hampton, Virginia:

- Building 582 – LTPT Tunnel Office
- Building 582A – LTPT Tunnel Circuit
- Building 583 – 16 inch and 6 by 28 inch Transonic Tunnel
- Building 583A – 16 inch and 6 by 28 inch Transonic Tunnel Storage
- Building 585 – 6-Inch by 19-Inch Transonic Tunnel Facility

The purpose of the proposed demolitions is to streamline NASA LaRC's infrastructure and reduce the Center's overall footprint by removing abandoned and deteriorating facilities that are no longer operational and/or needed to support NASA LaRC's mission. Buildings 583/583A, and 585 were closed by NASA LaRC in 1996 and Buildings 582/582A in 2006. Demolition is planned to begin in within the next year. Consistent with the results of the Phase I Reconnaissance Survey Architectural Resources at NASA LaRC (Dutton + Associates, 2009), NASA has determined that Buildings 583, 583A and 585 are eligible for listing in the National Register of Historic Places (NRHP) as contributing resources to a proposed historic district. Additionally, NASA has determined that Buildings 582 and 582A are potentially eligible for listing in the NRHP both individually, and as contributing resources to a potential historic district under Criteria A for their association with early advances in aeronautics research and testing by the NACA and NASA LaRC.

In accordance with 36 CFR § 800.5(a), NASA LaRC has applied the criteria of adverse effect of the proposed demolitions and has determined that the proposed undertaking will have an adverse effect on the five properties.

Environmental Assessment for Deconstruction and Transfer of  
Low-Turbulence Pressure Tunnel Complex Facilities

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In order to proceed with the proposed undertaking, and pursuant to the requirements of 36 CFR 800.6(a)(1), NASA is notifying you of the adverse effect on the five properties and inviting you to participate in the consultation. NASA plans to execute a memorandum of agreement (MOA) for the proposed undertaking with the SHPO and the Council, should you agree to participate.

For your review, we have enclosed brief descriptions, maps and photographs of the facilities.

Please feel free to contact Ms. Mary Gainer, the LaRC Cultural Resource Specialist at 757-864-7762 or [mary.e.gainer@nasa.gov](mailto:mary.e.gainer@nasa.gov) if you have any questions regarding this request.

Respectfully,



Rodney T. Harris  
Chief Architect  
Center Master Planner  
Historic Preservation Officer

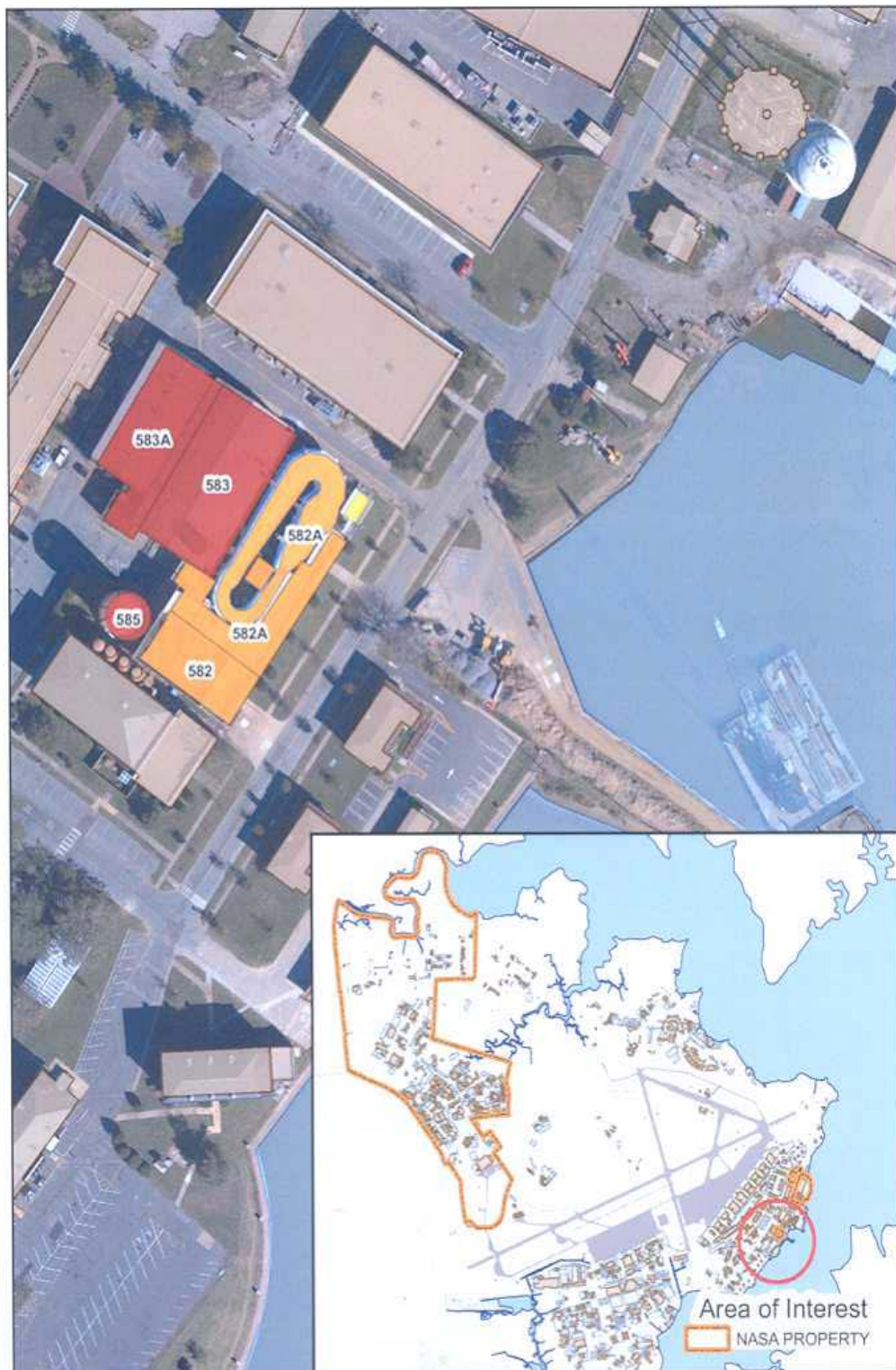
Phone: (757)864-6118

Fax: (757)864-8096

E-mail: [Rodney.t.harris@nasa.gov](mailto:Rodney.t.harris@nasa.gov)

Attachments

Environmental Assessment for Deconstruction and Transfer of  
Low-Turbulence Pressure Tunnel Complex Facilities





Environmental Assessment for Deconstruction and Transfer of  
Low-Turbulence Pressure Tunnel Complex Facilities

Building 582

Property Name: East Compressor Building

Address: 193 Thornell Avenue

Property Type: Testing Facility

Construction Date: 1923



Building 582A

Property Name: Low-Turbulence Pressure Tunnel

Address: 582A Thornell Avenue

Property Type: Testing Facility

Construction Date: 1940



Building 583

Property Name: 16 inch & 6x28 Transonic Wind Tunnel

Address: 583 Plumb Street

Property Type: Research Facility/Laboratory

Construction Date: 1938



Building 583A

Property Name: 16 inch & 6x28 Transonic Wind Tunnel Storage

Address: 583A Plumb Street

Property Type: Storage Facility

Construction Date: 1939



Building 585

Property Name: 6x19 inch Transonic Wind Tunnel

Address: 585 Thompson Street

Property Type: Research Facility/Laboratory

Construction Date: 1934



Environmental Assessment for Deconstruction and Transfer of  
Low-Turbulence Pressure Tunnel Complex Facilities

## Response from ACHP



Preserving America's Heritage

September 10, 2009

Mr. Rodney T. Harris  
Chief Architect  
National Aeronautics and Space Administration  
Langley Research Center  
Attn: 213  
Hampton, VA 23681-2199

**REF: *Proposed Demolition of LTPT Complex (Buildings 582, 582A, 583, 583A, and 585)  
Langley Research Center, Hampton, Virginia***

Dear Mr. Harris:

On August 28, 2009, the Advisory Council on Historic Preservation (ACHP) received your notification and supporting documentation regarding the adverse effects of the referenced project on properties listed on and eligible for listing in the National Register of Historic Places. Based upon the information you provided, we have concluded that Appendix A, *Criteria for Council Involvement in Reviewing Individual Section 106 Cases*, of our regulations, "Protection of Historic Properties" (36 CFR Part 800), does not apply to this undertaking. Accordingly, we do not believe that our participation in the consultation to resolve adverse effects is needed. However, if we receive a request for participation from the State Historic Preservation Officer (SHPO), Tribal Historic Preservation Officer, affected Indian tribe, a consulting party, or other party, we may reconsider this decision. Additionally, should circumstances change, and you determine that our participation is needed to conclude the consultation process, please notify us.

Pursuant to 36 CFR §800.6(b)(1)(iv), you will need to file the final Memorandum of Agreement (MOA), developed in consultation with the Virginia SHPO and any other consulting parties, and related documentation with the ACHP at the conclusion of the consultation process. The filing of the MOA and supporting documentation with the ACHP is required in order to complete the requirements of Section 106 of the National Historic Preservation Act.

Thank you for providing us with the opportunity to review this undertaking. If you have any questions, please contact Tom McCulloch at 202-606-8554, or via email at [tmcculloch@achp.gov](mailto:tmcculloch@achp.gov).

Sincerely,

Raymond V. Wallace  
Historic Preservation Technician  
Federal Property Management Section  
Office of Federal Agency Programs

ADVISORY COUNCIL ON HISTORIC PRESERVATION  
1100 Pennsylvania Avenue NW, Suite 803 Washington, DC 20004  
Phone: 202-606-8503 ☎ Fax: 202-606-8647 ☎ [achp@achp.gov](mailto:achp@achp.gov) ☎ [www.achp.gov](http://www.achp.gov)

## **APPENDIX B**

### **Photographs of 5 Low-Turbulence Pressure Tunnel Complex Buildings Proposed for Deconstruction and Transfer**

Environmental Assessment for Deconstruction and Transfer of  
Low-Turbulence Pressure Tunnel Complex Facilities

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Environmental Assessment for Deconstruction and Transfer of  
Low-Turbulence Pressure Tunnel Complex Facilities

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Building 582 – Low-Turbulence Pressure Tunnel Office; Proposed Transfer



Building 582A - Low-Turbulence Pressure Tunnel Circuit; Proposed Deconstruction

Environmental Assessment for Deconstruction and Transfer of  
Low-Turbulence Pressure Tunnel Complex Facilities

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Building 583 - 16 Inch & 6x28 Inch Transonic Wind Tunnel; Proposed Deconstruction



Building 583A - 16 Inch & 6x28 Inch Transonic Wind Tunnel Storage; Proposed Deconstruction

Environmental Assessment for Deconstruction and Transfer of  
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Building 585 - 6x19 Inch Transonic Wind Tunnel; Proposed Deconstruction

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## **APPENDIX C**

### **Memorandum of Agreement between the National Aeronautics and Space Administration Langley Research Center and the Virginia State Historic Preservation Office Relative to the Demolition of Fourteen Buildings Hampton, Virginia**

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Low-Turbulence Pressure Tunnel Complex Facilities

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**MEMORANDUM OF AGREEMENT  
BETWEEN THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION  
LANGLEY RESEARCH CENTER, AND  
THE VIRGINIA STATE HISTORIC PRESERVATION OFFICE  
RELATIVE TO THE DEMOLITION OF FOURTEEN BUILDINGS  
HAMPTON, VIRGINIA**

**WHEREAS**, the National Aeronautics and Space Administration, Langley Research Center (NASA LaRC) proposes to demolish Building 582A (DHR ID # 114-5313-0394), Building 583 (DHR ID # 114-5313-0395), Building 583A (DHR ID # 114-5313-0396), Building 585 (DHR ID # 114-5313-0397), Building 1156 (DHR ID # 114-5313-0297), Building 1164 (DHR ID # 114-5313-0304), Building 1203 (DHR ID # 114-5313-0328), Building 1232B (DHR ID # 114-5313-0227), Building 1284C (DHR ID # 114-5313-0366), Building 1299A (DHR ID # 114-5313-0292), Building 1299B (DHR ID # 114-5313-0293), Building 1299C (DHR ID # 114-5313-0294), Building 1299D (DHR ID # 114-5313-0384), and Building 1299E (DHR ID # 114-5313-0385) ("Undertaking"), and

**WHEREAS**, pursuant to 36 CFR Part 800, regulations implementing Section 106 of the National Historic Preservation Act of 1966 (NHPA), as amended, 16 U.S.C. 470(f), NASA LaRC is required to take into account the effect of its actions on properties included in or eligible for inclusion in the National Register of Historic Places (NRHP) prior to the approval and implementation of such actions and to consult with the Virginia Department of Historic Resources (DHR), which serves as the Virginia State Historic Preservation Office (SHPO); and

**WHEREAS**, NASA LaRC, in consultation with the SHPO, has determined that the area of potential effect (APE) for the Undertaking includes the building footprints and the immediate area surrounding the buildings where ground disturbing actions can reasonably be expected to occur (Appendix A); and

**WHEREAS**, NASA LaRC has completed efforts to identify any potential historic properties that may be affected by the Undertaking; and

**WHEREAS**, NASA LaRC has submitted the report entitled *Phase I Reconnaissance Survey of Architectural Resources at the National Aeronautics and Space Administration, Langley Research Center, Hampton, Virginia* (DHR File No. 2006-1634, Dutton et al. June 2008), and *Phase I Reconnaissance Survey of the Architectural Resources at the National Aeronautics and Space Administration, Langley Research Center Addendum* (DHR File No. 2006-1634, Dutton et al. August 2009) to the SHPO; and

**WHEREAS**, NASA LaRC, in consultation with the SHPO, has determined that the NASA LaRC Historic District (DHR ID # 114-5313; Historic District) is eligible for listing in the NRHP under Criteria A and C because of major contributions the facilities made to aeronautics and space research and testing; and

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**WHEREAS**, NASA LaRC, in consultation with the SHPO, has determined that Building 582A (DHR ID# 114-5313-0394) is eligible for listing in the NRHP under Criterion A both individually and as a contributing resource to the Historic District (DHR ID# 114-5313); and

**WHEREAS**, NASA LaRC, in consultation with the SHPO, has determined that Building 583 (DHR ID# 114-5313-0395), Building 583A (DHR ID# 114-5313-0396), and Building 585 (DHR ID # 114-5313-0397) are eligible for listing in the NRHP under Criteria A and C as contributing resources to the Historic District; and

**WHEREAS**, NASA LaRC, in consultation with the SHPO, has determined that Building 1156 (DHR ID # 114-5313-0297), Building 1164 (DHR ID # 114-5313-0304), Building 1203 (DHR ID # 114-5313-0328), Building 1232B (DHR ID # 114-5313-0227), Building 1284C (DHR ID # 114-5313-0366), Building 1299A (DHR ID # 114-5313-0292), Building 1299B (DHR ID # 114-5313-0293), Building 1299C (DHR ID # 114-5313-0294), Building 1299D (DHR ID # 114-5313-0384), and Building 1299E (DHR ID # 114-5313-0385) are eligible for listing in the NRHP under Criterion A as contributing resources to the Historic District for their association with early advances in aeronautics research and testing by the National Advisory Committee for Aeronautics (NACA) and NASA; and

**WHEREAS**, NASA LaRC, in consultation with the SHPO, has determined that the proposed Undertaking has the potential to affect Buildings 582A (DHR ID # 114-5313-0394), 583 (DHR ID # 114-5313-0395), 583A (DHR ID # 114-5313-0396), 585 (DHR ID # 114-5313-0397), 1156 (DHR ID # 114-5313-0297), 1164 (DHR ID # 114-5313-0304), 1203 (DHR ID # 114-5313-0328), 1232B (DHR ID # 114-5313-0227), 1284C (DHR ID # 114-5313-0366), 1299A (DHR ID # 114-5313-0292), 1299B (DHR ID # 114-5313-0293), 1299C (DHR ID # 114-5313-0294), 1299D (DHR ID # 114-5313-0384), and 1299E (DHR ID # 114-5313-0385); and

**WHEREAS**, NASA LaRC has invited the Advisory Council on Historic Preservation (ACHP) to participate in development of this memorandum of agreement (Agreement) and the ACHP declined to participate in a letter dated September 10, 2009; and

**WHEREAS**, NASA LaRC has afforded the public an opportunity to review and comment on the Undertaking through preparation of an Environmental Assessment to address 40 CFR Parts 1500-1508 of the National Environmental Policy Act (NEPA) and applicable requirements of Section 110 and Section 106 of the NHPA and no public comments were received;

**NOW THEREFORE**, NASA LaRC and the SHPO agree that the Undertaking shall be implemented in accordance with the following stipulations in order to satisfy NASA LaRC's Section 106 responsibilities to take into account the effects of the Undertaking on properties listed or considered eligible for listing in the NRHP.

#### **STIPULATIONS**

NASA LaRC shall ensure that the following stipulations are carried out:



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**I. Mitigation**

NASA shall perform the following actions in order to mitigate the adverse impacts of demolition:

A. For Building 582A (DHR ID # 114-5313-0394):

1. Completion of Intensive Level Survey Forms and accompanying documentation according to current SHPO survey standards for retention in the archives of the Commonwealth of Virginia's DHR. At a minimum, the intensive level survey shall include entering the documentation into the DHR Data Sharing System (DSS); detailed exterior and interior architectural descriptions; exterior (all elevations and significant architectural details) and interior (representative rooms, significant architectural details, and significant areas where research occurred) photographs; background research into the history and use of the building; and existing floor plans to scale of all levels. Additional documentation will include photographs (exterior and interior views or historic views where available) with large format negatives or photographically reproduced on Mylar in accordance with the U.S. Copyright Act, as amended, select existing drawings where available. NASA LaRC shall submit the documentation and supporting information to the SHPO within six (6) months of the date of the last signature on this Agreement. Once the building has been demolished, NASA LaRC will notify the SHPO so DSS record may be updated.
2. Development of additional materials for NASA LaRC's existing Cultural Resource Management (CRM) website (<http://gis.larc.nasa.gov/historic/larc>) to allow for public interpretation of the history of the property. NASA shall implement and maintain these materials, which shall include, but not be limited to, the following elements:
  - a. Current and historical interior and exterior photographs of the buildings,
  - b. Written records and historical documents related to the research and testing performed in the buildings,
  - c. Video clips, if available, of research projects and tests performed in the buildings,
  - d. Video-taped interviews, if available, of the persons who worked in the buildings and associated research projects.
3. Salvage of architectural or scientific/engineering elements from historic properties where appropriate. NASA LaRC will ensure that salvage will not be undertaken without prior documentation. Qualified professionals meeting the Secretary of the Interior's *Professional Qualifications Standards* in the appropriate discipline shall examine the historic property to identify if any artifacts or structural elements are worthy of salvage for preservation purposes. NASA LaRC shall ensure that the items selected are removed in a manner that minimizes damage. NASA LaRC will apply its agreement with the Smithsonian ("Agreement Between the National Aeronautics and Space Administration and the Smithsonian Institution Concerning the Transfer and Management of NASA Historical Artifacts, May 28, 1998" as set forth in NASA Procedural Requirement [NPR] 4310.1 dated March 16, 1999) (Appendix B) to determine appropriate retention and curation activities with respect to significant artifacts.

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B. For Buildings 583 (DHR ID # 114-5313-0395), 583A (DHR ID # 114-5313-0396), 585 (DHR ID # 114-5313-0397), 1232B (DHR ID # 114-5313-0227), 1284C (DHR ID # 114-5313-0366), 1299D (DHR ID # 114-5313-0384), and 1299E (DHR ID # 114-5313-0385):

1. Development of additional materials for NASA LaRC's existing CRM website (<http://gis.larc.nasa.gov/historic/larc>) to allow for public interpretation of the history of the properties. NASA shall implement and maintain these materials, which shall include, but not be limited to, the following elements:
  - a. Current and historical interior and exterior photographs of the buildings,
  - b. Written records and historical documents related to the research and testing performed in the buildings,
  - c. Video clips, if available, of research projects and tests performed in the buildings,
  - d. Video-taped interviews, if available, of the persons who worked in the buildings and associated research projects.
2. Update of property status in VDHR's DSS and notify DHR that the demolition and updates have taken place.

C. For Buildings 1156 (DHR ID # 114-5313-0297), 1164 (DHR ID # 114-5313-0304), 1203 (DHR ID # 114-5313-0328), 1299A (DHR ID # 114-5313-0292), 1299B (DHR ID # 114-5313-0293), and 1299C (DHR ID # 114-5313-0294):

1. Update of property status in VDHR's DSS and notify DHR that the demolition and updates have taken place.

D. Within twelve (12) months of the date of the last signature on this Agreement NASA LaRC shall place or shall cause to be placed a copy of all the photographs, records, video clips, and other information used on the CRM public website on file at either the NASA History Office, the LaRC Technical Library, or the VASC to comply with 16 USC 470a(a)(7)(A). NASA LaRC shall also provide or cause to be provided copies of these materials to the SHPO.

## II. Review of Documentation

The SHPO and other consulting parties agree to review all documentation pursuant to this Agreement within thirty (30) days after confirmed receipt of complete documentation. If a consulting party fails to comment, NASA LaRC may assume the non-responding party has no comments. NASA LaRC shall address all comments received within the thirty (30)-day comment period and proceed.

## III. Professional Qualifications

NASA LaRC shall ensure that all activities regarding historic buildings carried out pursuant to the Agreement are carried out by or under the direct supervision of a person or persons meeting at a minimum the *Secretary of the Interior's Professional Qualification Standards for Historic Architecture* (48 FR 44.739), and that all activities regarding archaeology are carried out by or



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under the direct supervision of a person or persons meeting the *Secretary of the Interior's Professional Qualification Standards for Historic Archaeology* (48 FR 44.739).

#### IV. Report Preparation

A.. All architectural studies resulting from this Agreement shall be consistent with pertinent standards and guidelines of the Secretary of the Interior, including as applicable the *Secretary's Standards and Guidelines for Historical Documentation* (48 FR 44728-30) and *Architectural and Engineering Documentation* (48 FR 44730-34), as well the SHPO's *Guidelines for Conducting Cultural Resource Survey in Virginia* (1999, rev. 2003), and the *Secretary of the Interior's Standards for the Treatment of Historic Properties*, or subsequent revisions or replacement of these documents.

B. NASA LaRC shall ensure that all archaeological reports, including treatment plans are consistent with the *Secretary of the Interior's Standards and Guidelines for Archaeological Documentation* (48 FR 44734-37), the ACHP's *Section 106 Archaeology Guidance* (June 2007) and the SHPO's *Guidelines for Conducting Cultural Resource Survey in Virginia* (1999, revised 2003), and the *Secretary of the Interior's Standards for the Treatment of Historic Properties*, or subsequent revisions or replacement of these documents.

#### V. Curation

NASA LaRC shall ensure that all archaeological materials and appropriate field and research notes, maps, drawing and photographic records collected as part of this project (with the exception of human skeletal remains and associated funerary objects) shall be cared for in a repository meeting federal 36 CFR Part 79, Curation of Federally Owned and Administered Archaeological Collections. NASA LaRC shall provide the SHPO with a copy of the curation agreement as evidence of its compliance with this stipulation. All such items shall be made available to educational institutions and individual scholars for appropriate exhibit and/or research under the operating policies of the selected repository.

#### VI. Post Review Discoveries

NASA LaRC shall include in all construction contracts a provision requiring the contractor to immediately notify the appropriate NASA officials of any discovery of previously unidentified historic properties, and to cease work in the area in which the discovery is made.

NASA LaRC agrees to take the following actions when notified by its contractor of the discovery:

A.

1. Inspect the construction site to determine the extent of the discovery and ensure that construction activities have halted; and
2. Clearly mark the area of discovery; and

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3. Implement additional measures, as appropriate, to protect the discovery from looting and vandalism; and
4. Have a professional archaeologist inspect the construction site to determine the extent of the discovery and provide recommendations regarding its NRHP eligibility and treatment; and
5. Notify the SHPO and other consulting parties of the discovery describing the measures that have been implemented.

B Within five (5) working days of receipt of the professional archaeologist inspection described in Stipulation VI.A.4 above, NASA LaRC shall provide the SHPO and other consulting parties with its assessment of the NRHP eligibility of the discovery and the measures it proposes to take to resolve adverse effects. In making its official evaluation, NASA LaRC, in consultation with the SHPO, may assume the discovery to be NRHP eligible for the purposes of Section 106 pursuant to 36 CFR 800.13(c). NASA LaRC, SHPO, and other consulting parties shall respond within forty-eight (48) hours of receipt.

C. NASA LaRC, which shall take into account consulting parties' recommendations on eligibility and treatment of the discovery, shall ensure that appropriate actions are carried out, and provide the SHPO and other consulting parties with a report on these actions when they have been implemented.

D. Construction activities may proceed in the area of the discovery, when NASA LaRC has determined that implementation of the actions undertaken to address the discovery pursuant to Stipulation VI. are complete.

E. Any disputes over the evaluation or treatment of previously unidentified resources will be resolved in accordance with Stipulation VIII. ("Dispute Resolution") of this Agreement.

## **VII. Human Remains**

A. NASA LaRC shall treat all human skeletal remains and associated funerary objects encountered during the course of actions taken as a result of this Agreement in the manner consistent with the ACHP "Policy Statement Regarding Treatment of Burial Sites, Human Remains and Funerary Objects" (February 23, 2007; <http://www.achp.gov/docs/hrpolicy0207.pdf>). All reasonable efforts will be made to avoid disturbing gravesites, including those containing Native American human remains and associated artifacts. To the extent possible, the NASA LaRC will ensure that the general public is excluded from viewing any gravesites and associated artifacts. All consulting parties agree to release no photographs of any gravesites and/or funerary objects to the press or to the general public..

B. If the human remains encountered appear to be of Native American origin, whether prehistoric or historic, NASA LaRC shall follow the regulations set forth in the Native American



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Graves Protection and Repatriation Act (25 USC 3001) and its implementing regulations, 43 CFR Part 10.

C. NASA LaRC agrees that if avoidance of the human remains is not prudent and feasible, NASA LaRC shall apply for a permit from DHR for the archaeological removal of human remains in accordance with the provisions of the *Virginia Antiquities Act*, Section 10.1-2305 of the *Code of Virginia*, and with the final regulations adopted by the Virginia Board of Historic Resources and published in the Virginia Register of July 15, 1991.

#### **VIII. Dispute Resolution**

A. Should any party to this Agreement object in writing to NASA LaRC regarding any action carried out or proposed with respect to the Undertaking or to implementation of this Agreement, NASA LaRC will consult with the objecting party to resolve the objection. If after initiating such consultation NASA LaRC determines that the objection cannot be resolved through consultation, NASA LaRC shall prepare documentation relevant to the objection in accordance with 36 CFR Part 800.11 and shall forward such documentation relevant to the objection to the ACHP, including NASA LaRC's proposed response to the objection. Within thirty (30) working days after receipt of all pertinent documentation, the ACHP shall exercise one of the following options:

1. Advise NASA LaRC that the ACHP concurs with the NASA LaRC's proposed response to the objection, whereupon the agency shall respond to the objection accordingly;
2. Provide NASA LaRC with recommendations, which the NASA LaRC shall take into account in reaching a final decision regarding its response to the objection; or
3. Notify the NASA LaRC that the objection will be referred to comment pursuant to 36 CFR Part 800.7(a)(4), and proceed to refer the objection and comment. NASA LaRC shall take the resulting comment into account in accordance with 36 CFR Part 800.7(c)(4) and Section 110(1) of the National Historic Preservation Act (NHPA).

B. Should the ACHP not exercise one of the above options within thirty (30) days after receipt of all pertinent documentation, NASA LaRC may assume the ACHP's concurrence in its proposed response to the objection.

C. NASA LaRC shall take into account any ACHP recommendation or comment provided in accordance with this stipulation with reference only to the subject of the objection; NASA LaRC's responsibility to carry out all actions under this Agreement that are not the subjects of the objection shall remain unchanged.

D. At any time during implementation of the measures stipulated in this Agreement, should an objection pertaining to this Agreement be raised by a member of the public, NASA LaRC shall notify the parties to this Agreement and take the objection into account, consulting with the

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objector and, should the objector so request, with any of the parties to this Agreement to resolve the objection.

**IX. Amendment and Termination**

A. Any signatory to this Agreement may request that it be amended, whereupon the parties shall consult in accordance with 36 CFR Part 800.6(c)(7) to consider such an amendment. This Agreement may be amended only upon the written agreement of all signatory parties. If it is not amended, this Agreement may be terminated by any signatory party in accordance with the provisions below.

B. If NASA LaRC determines that the terms of this Agreement cannot be carried out, or if the SHPO determines the Agreement is not being properly implemented, NASA LaRC of the SHPO may propose to the other parties that it be terminated.

C. Termination shall include the submission of any outstanding documentation on any work done up to and including the date of termination.

D. A party proposing to terminate this Agreement shall notify all parties to the Agreement, explaining the reasons for termination and affording them at least thirty (30) days to consult and seek alternatives to termination. The parties shall then consult.

E. Should such consultation fail and this Agreement be terminated, NASA LaRC shall either consult in accordance with 36 CFR Part 800.6 to develop a new agreement or request the comments of the ACHP pursuant to 36 CFR Part 800.7. In the event of termination, work on the Project in the area(s) with affected historic properties will cease until NASA LaRC has fulfilled its Section 106 responsibilities.

**X. Duration of the Agreement**

This Agreement shall continue in full force and effect until the work contemplated herein is completed or for a period not to exceed five (5) years, which ever shall occur first. At any time within the six (6) month period prior to expiration of the Agreement, NASA LaRC may request the signatory parties to consider an extension or modification of this Agreement. No extension or modification will be effective unless all parties to the Agreement have agreed with it in writing.

**XI. Failure to Carry Out the Terms of the Agreement**

In the event that the terms of this Agreement are not carried out, then NASA LaRC shall comply with 36 CFR Part 800 with regard to any actions covered by this Agreement.

**XII. Anti-Deficiency Act**

The stipulations of this Agreement are subject to the provisions of the Anti-Deficiency Act. If compliance with the Anti-Deficiency Act alters or impairs NASA LaRC's ability to implement

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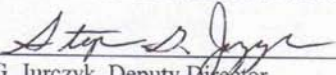
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the stipulations of this Agreement, NASA LaRC shall consult in accordance with the amendment and termination procedures found in Stipulation IX. of this Agreement.


Execution of this Agreement by NASA LaRC and the SHPO and its submission to the ACHP in accordance with 36 CFR Part 800.6(b)(1)(iv), shall, pursuant to 36 CFR Part 800.6(c), be considered to be an agreement with the ACHP for the purposes of Section 110(l) of the NHPA. Execution and submission of this Agreement, and implementation of its terms, evidence that NASA LaRC has afforded the ACHP an opportunity to comment on the proposed Undertaking and its effect on historic properties, and that NASA LaRC has taken into account the effect of the Undertaking on historic properties.

#### SIGNATORIES

##### NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

By:  Date: 11/23/09  
Stephen G. Jurczyk, Deputy Director  
Langley Research Center

##### VIRGINIA STATE HISTORIC PRESERVATION OFFICER

By:  Date: 12/1/09  
Kathleen S. Kilpatrick, Director  
Virginia Department of Historic Resources

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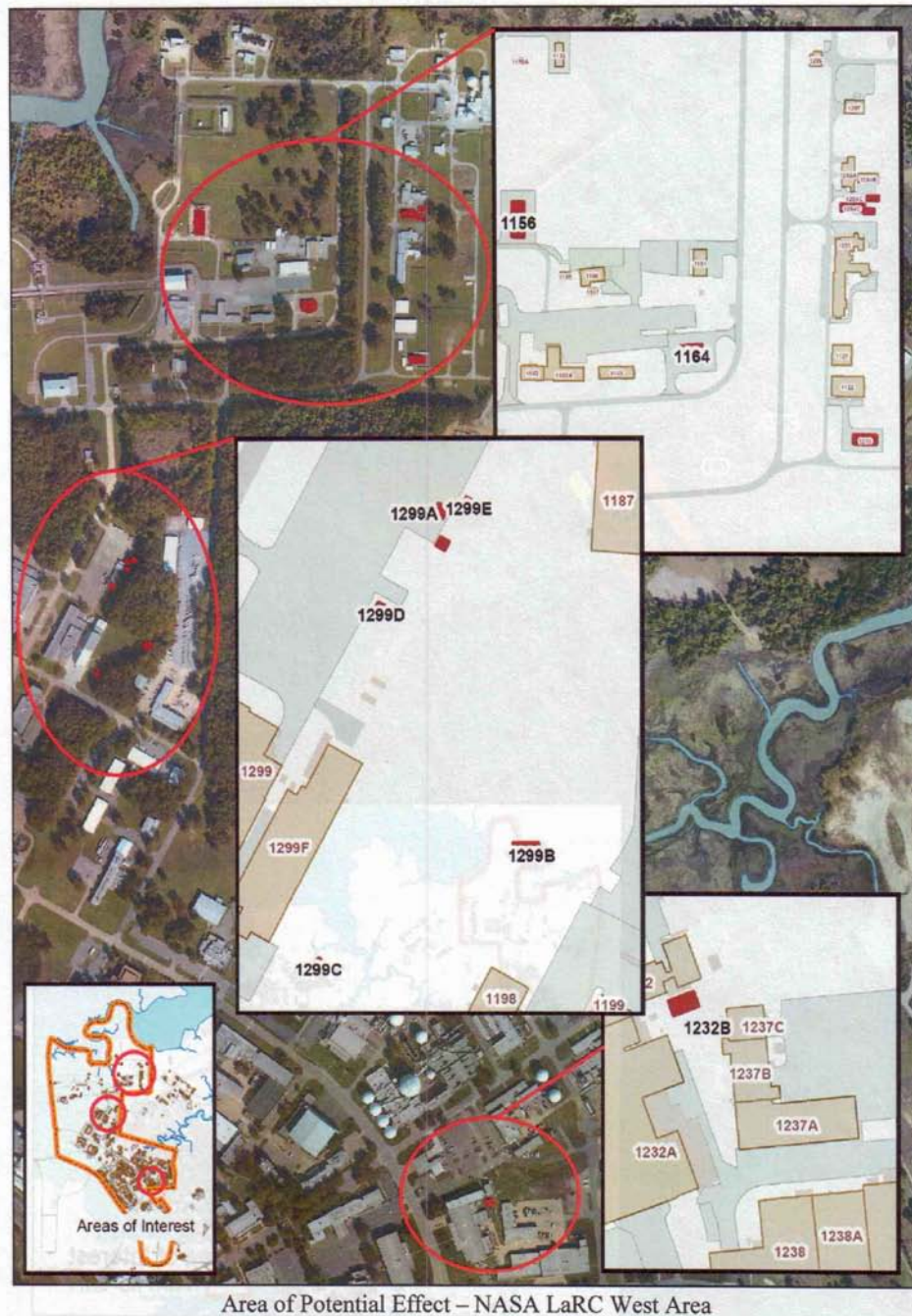
APPENDIX A

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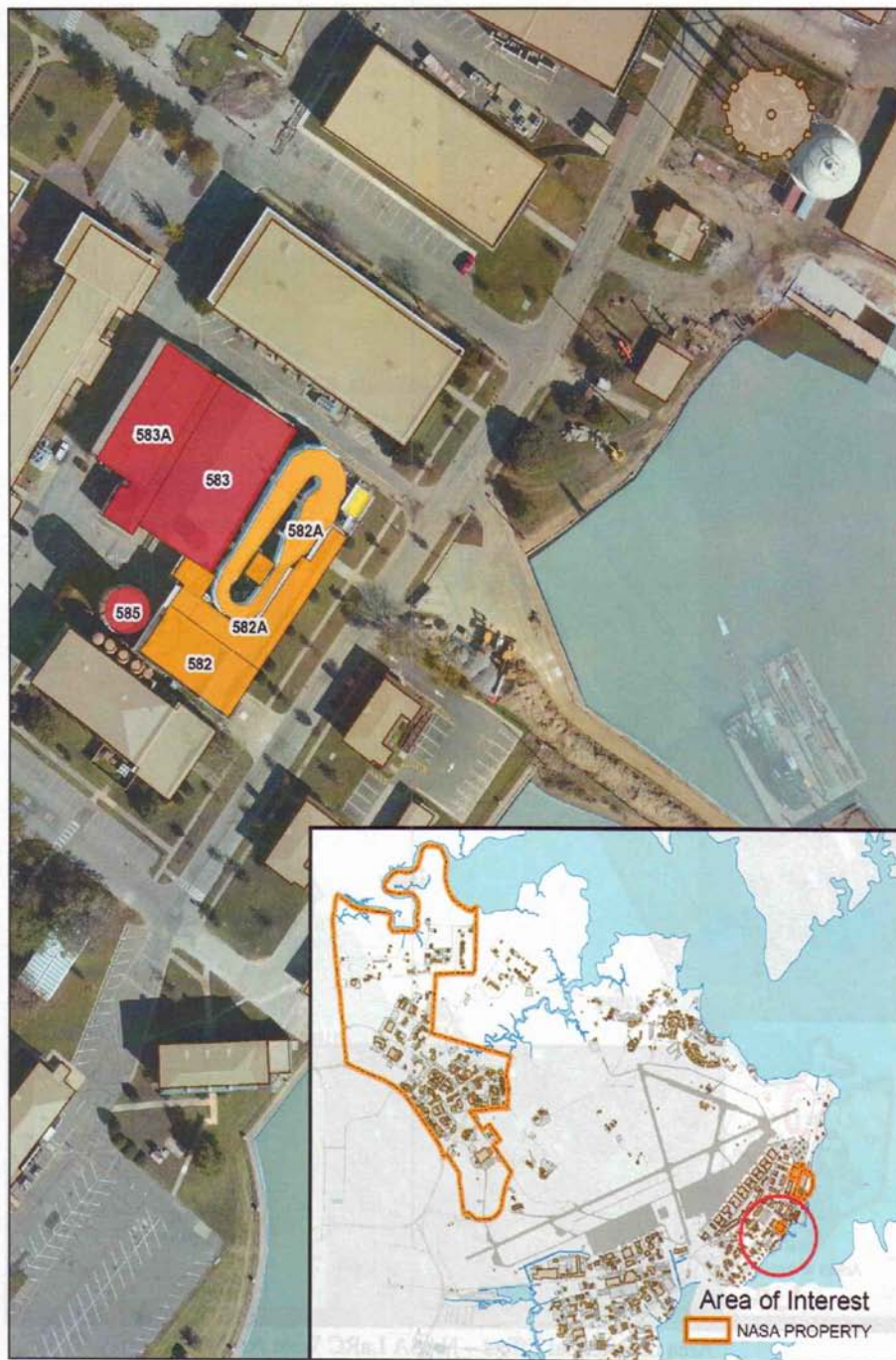
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Area of Potential Effect – NASA LaRC East Area



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APPENDIX B

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**AGREEMENT BETWEEN THE  
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION  
AND THE  
SMITHSONIAN INSTITUTION  
CONCERNING THE TRANSFER AND MANAGEMENT OF  
NASA HISTORICAL ARTIFACTS**

WHEREAS in the course of its programs the National Aeronautics and Space Administration produces a large number of artifacts, many with great historical value and others with great value for education, exhibition, and other purposes, relating to the development, demonstration, and application of aeronautical and astronautical science and technology of flight, and will continue to acquire such materials; and

WHEREAS such artifacts are unique specimens relating to the science and technology of aeronautics and astronautics, and of flight in the atmosphere and space, which may consist of aeronautical and astronautical objects including, but not limited to, aircraft, space launch vehicles, spacecraft (both manned and unmanned), subsystems of the above, such as rocket engines, pressure suits and personal equipment, instruments, significant recorded data, operating handbooks, drawings, photographs, motion picture film and related documents, audio and video tapes, training devices, simulators, and memorabilia; and

WHEREAS the Smithsonian Institution is charged with the responsibility to preserve for perpetuity artifacts representative of aviation and space flight; to collect, preserve, and display aeronautical and space flight equipment of historical and educational interest and significance; to serve as a repository for scientific equipment and data pertaining to the development of aviation and space flight; and to provide educational material for the historical study of aviation and space flight.

THEREFORE, under the authority set forth in Section 203(c)(6) of the National Aeronautics and Space Act of 1958, as amended (72 Stat. 430; 42 U.S.C. 2473(c)(6); Section 4 of the Act of August 30, 1961 (75 Stat. 415, 20 U.S.C. 80c); and Sections (4) and (8) of the National Air Museum Amendments Act of 1966 (80 Stat. 310, 311; 20 U.S.C. 77a, 77d), the National Aeronautics and Space Administration (hereafter called "NASA") and the Smithsonian Institution (hereafter called "Smithsonian") enter into this Agreement concerning the transfer and management of those artifacts having such historical and educational or other value which have emerged and will emerge from the aeronautical and space programs administered by NASA.

1. NASA shall offer to transfer to, and the Smithsonian may accept such artifacts under NASA control which become available, after programmatic utility to NASA or other government agencies has been exhausted, although, in extraordinary circumstances, exceptions or alternative dispositions can be made by NASA. Before the decision to make an exception or alternative disposition is made, the proposed action shall be referred to the Joint Artifacts Committee (established in paragraph 4, below) for consideration. In addition, the Smithsonian may, pursuant to the procedures contained in paragraph 4, call a special meeting of the Joint Committee to discuss the transfer or

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preservation of items of unusual historical interest that NASA has not yet declared to be artifacts. In either instance, if no consensus can be achieved by the Joint Artifacts Committee, the issue shall, upon request of either NASA or the Smithsonian, be referred to the NASA Administrator and the Director of the Smithsonian's National Air and Space Museum (NASM) for consideration. In the event agreement still cannot be reached, the NASA Administrator will decide the issue. NASA undertakes no obligation to provide financial support to the Smithsonian for the storage, transport, preparation, and final transfer of space artifacts.

2. The Smithsonian Institution's National Air and Space Museum will accession into its National Collections and accept responsibility for the custody, control, protection, preservation, and display of such artifacts transferred by NASA both in the Museum itself and on loan to NASA and other appropriate organizations in a manner consistent with the prevailing collections policy of NASM. If NASM refuses a request from a NASA component or visitor center for a loan of a NASA artifact, or states its intention to terminate or not to renew an existing loan to NASA, NASA may call a meeting of the Joint Committee at which the reasons for and possible alternatives to the denial will be discussed. Loans of artifacts to NASA shall be made for periods of from three to five years, with the expectation that renewals will be granted. NASM may specify reasonable curatorial practices to be followed by NASA components or visitor centers with respect to loaned NASA artifacts, and NASA will implement these practices to the extent practicable.

3. In connection with the NASA artifacts transferred to the Smithsonian, it is understood that in no instance shall a NASA artifact be finally disposed of to an agency other than the United States Government, or destroyed, before an opportunity is extended to NASA to reacquire, not on a basis of purchase but of reasonable defrayment of the costs involved, custody, and control of the artifacts. Further, in the event that NASA determines that an item declared an artifact and transferred to the Smithsonian has renewed technical utility with respect to NASA's programs, the NASA Chair of the Joint Artifacts Committee may request NASM to loan the item back to NASA. NASM will make a good faith effort to comply with the NASA request in light of NASA's stated need and the potential impacts on the NASM collection and/or operations. In utilization of this procedure, both NASA and the NASM will work promptly and closely to minimize any adverse impact that the loan could have on NASM operations. Cost of shipping and packaging the item for return to NASA will be borne or reimbursed by NASA.

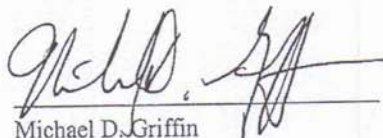
4. The Smithsonian and NASA will establish a Joint Artifacts Committee to collect information on and consider issues relating to NASA artifacts and their transfer to the Smithsonian. This charter includes, but is not limited to, those issues identified for Committee consideration in paragraphs 1 and 2 above. It is anticipated that the Committee will meet at least two times per year, although either NASA or NASM may call a special meeting on 30 days notice.



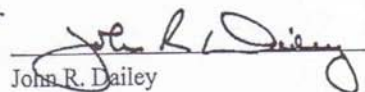
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5. The agreement shall be effective for five years from the date of the latest signature. Unless written notification is given by either party at least six months prior to expiration, it will be renewed automatically for an additional five years.



Michael D. Griffin  
Administrator  
National Aeronautics and Space  
Administration



John R. Dailey  
Director  
National Air and Space Museum  
Smithsonian Institution

Date 8 Aug 2008

Date 8.20.08