

**HISTORICAL SURVEY AND EVALUATION OF THE
JAY JAY BRIDGE, RAILROAD SYSTEM, AND LOCOMOTIVES,
JOHN F. KENNEDY SPACE CENTER,
BREVARD COUNTY, FLORIDA**

Prepared for:

**National Aeronautics and Space Administration
Kennedy Space Center
Environmental Management Branch**

Prepared by:



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**Basic Ordering Agreement No. IHA-BOA-09-009A
Task Order No. TO-017**

**September 2012
Rvsd. November 2012**

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1.0 INTRODUCTION

1.1 Purpose and Objectives

In January 2012, Archaeological Consultants, Inc. (ACI) conducted a historical survey and evaluation of the Jay Jay Railroad Draw Bridge (Jay Jay Bridge, H2-1198), the railroad system, and the locomotives and railcars at the National Aeronautics and Space Administration (NASA) John F. Kennedy Space Center (KSC) in Brevard County, Florida (see **Figure 1-1**). This work was performed on behalf of the KSC Environmental Management Branch under contract to InoMedic Health Applications, LLC (IHA; formerly Innovative Health Applications) (Task Order No. 017, Basic Ordering Agreement No. IHA-BOA-09-009A). The purpose of the survey, conducted in accordance with Section 110 of the National Historic Preservation Act of 1966, as amended, was to evaluate the significance of the Jay Jay Bridge, the NASA KSC railroad system, and the locomotives and railcars in terms of the criteria of eligibility for listing in the National Register of Historic Places (NRHP) (36 CFR Part 60.4).

1.2 Methods

The historical survey and evaluation of the NASA KSC railroad system assets, including the Jay Jay Bridge, entailed three tasks: research and context development, field survey, and report preparation. The archival research and historical context development were accomplished between January and June 2012. Research was conducted at the KSC Archives Department, the KSC Transportation Office (KSC-TO), and the KSC Engineering Documents Center. Based upon the research findings, a historic context for the railroad system was prepared.

The field survey was conducted during the week of January 23, 2012. Examination of the assets was supplemented by interviews with facility managers and other personnel. Descriptive information was recorded on site, including construction materials and distinguishing features, and digital photographs were taken.

Following research and field survey, all identified resources were evaluated for their significance in terms of the eligibility criteria for listing in the NRHP. Guidance in applying the criteria was provided by reference to a number of United States (U.S.) Department of the Interior, National Park Service publications, including *Guidelines for Applying the National Register Criteria for Evaluation* (Bulletin 15); *Guidelines for Completing National Register of Historic Places Forms: How to Complete the National Register Registration Form* (Bulletin 16A); and *Guidelines for Evaluating and Nominating Properties that Have Achieved Significance within the Last Fifty Years* (Bulletin 22).

1.3 Acknowledgements

This historical survey project benefited from the cooperative efforts of many individuals. Special thanks are extended to KSC Historic Preservation Officer, Barbara Naylor, and to KSC Cultural Resource Specialist, Nancy English, for coordinating access to the facilities and personnel providing informational materials. We gratefully acknowledge the generous assistance of Bruce Chesson, KSC Transportation Officer, Alternative Fuel Vehicle Program, for providing a tour of the facility, as well as access to the KSC-TO files and historic photographs, and Liz Stevey, KSC Transportation Office, for scanning historic photographs. ACI would also like to thank the many individuals who shared

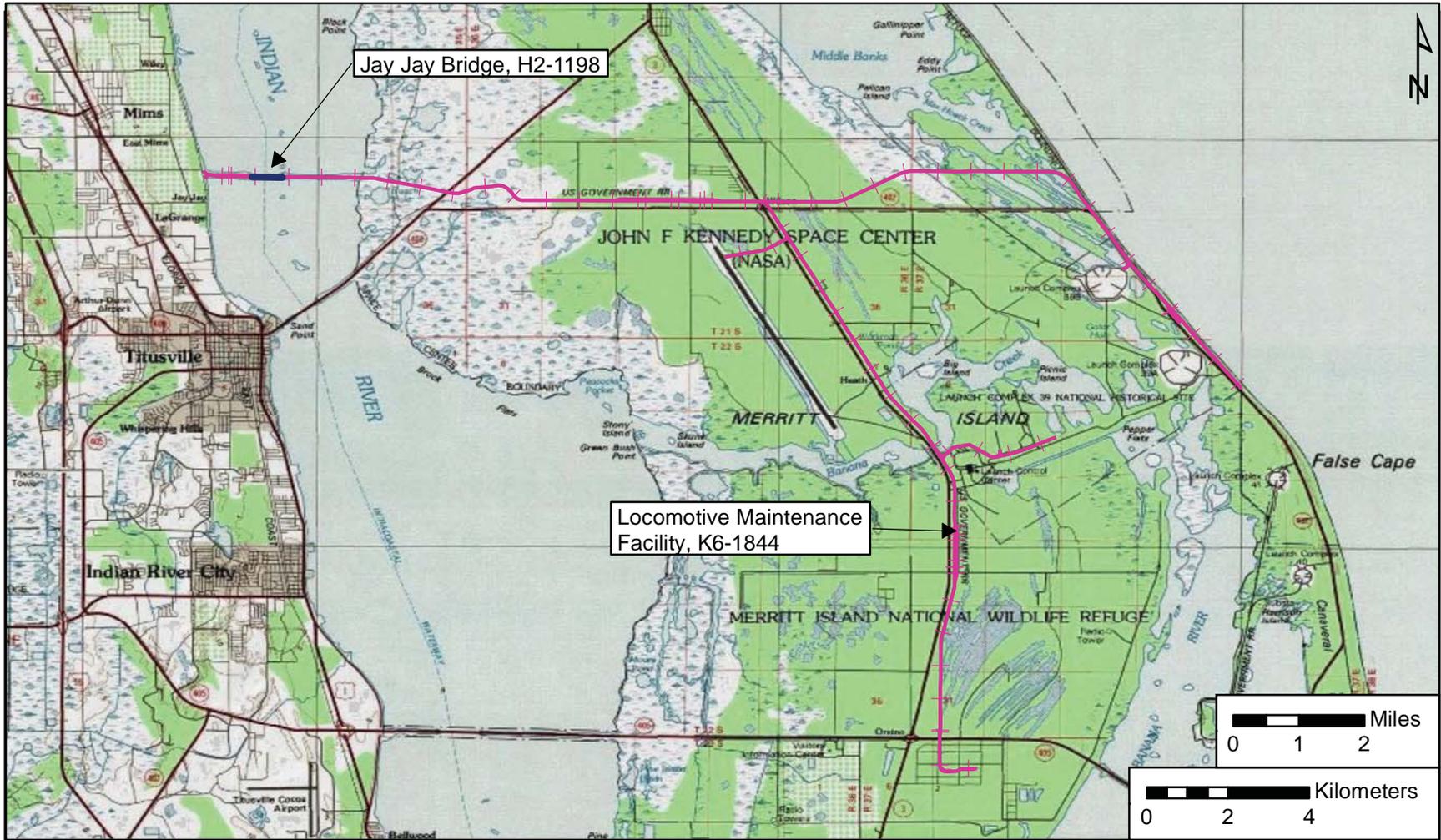


Figure 1-1. Location of the NASA KSC Railroad Track (pink), the Jay Jay Bridge (blue), and the Locomotive Maintenance Facility (LMF). The LMF is where the locomotives and railcars are typically stored.



their knowledge of the history and use of the facilities and railcars, including Jesse Crews and Mike Stephens, NASA KSC railroad Technicians; Frank Washburn, Bridge Engineer; and Dave Hoffman, retired NASA KSC railroad Manager. Elaine Liston, KSC Archivist, is thanked for providing archival source materials, including historic photographs. ACI is also grateful to Jane Provancha, IHA, for contract and logistical support.

2.0 HISTORICAL CONTEXT

2.1 John F. Kennedy Space Center and the U.S. Manned Space Program

In October 1949, President Harry S. Truman established the Joint Long Range Proving Ground (currently known as the Air Force Eastern Test Range), a vast overwater military rocket test range that now extends over 5,000 miles down the Atlantic Coast from Cape Canaveral Air Force Station (CCAFS) to Ascension Island (Benson and Faherty 2001). CCAFS was ideal for testing missiles. Virtually uninhabited, it enabled personnel to inspect, fuel, and launch missiles without danger to nearby communities. The area's climate also permitted year-round operations. The first launch from CCAFS, conducted by a military-civilian team on July 24, 1950, was of a modified German V-2 rocket with an attached upper stage.

By the late 1950's, the military services began to launch artificial satellites. Explorer I, America's first satellite, was launched on January 31, 1958, from CCAFS by a military-civilian team of the Army's Missile Firing Laboratory (MFL). This group, under the direction of Dr. Kurt H. Debus, a key member of the famed Dr. Wernher von Braun rocket team, later formed the nucleus of KSC (Benson and Faherty 2001).

On October 4, 1957, the Union of Soviet Socialist Republics (USSR) launched the first man-made Earth satellite, Sputnik 1; on November 3, 1957, the USSR placed Sputnik II, carrying a dog named Laika, into orbit. This sparked a wave of interest in space exploration among the American public, and less than two weeks after the launch of Sputnik II, Senator Lyndon B. Johnson called for, and chaired, an examination of the American space effort (Launius 2001). On February 6, 1958, the U.S. Congress formed the Committee on Space and Astronautics to frame legislation for a national space program (Grimwood 1963). On July 29, 1958, President Dwight D. Eisenhower signed the National Aeronautics and Space Act into law. Subsequently, as per this Act, NASA was officially established on October 1, 1958, to carry out all nonmilitary space projects (Grimwood 1963; Launius 2001).

With the creation of NASA in October 1958, the nation turned its attention to the peaceful exploration of space. NASA became a resident of Cape Canaveral in 1958 when the MFL, then working on the Saturn rocket project managed by Debus, was transferred to NASA. Several Army facilities at CCAFS were transferred to NASA including Launch Complexes (LC) 5, 6, 26, and 34, plus various offices and hangars. The MFL was renamed the Launch Operations Directorate and became a branch office of the George C. Marshall Space Flight Center (MSFC). The Saturn project continued as a civilian operation (Benson and Faherty 2001).

Eight days following the establishment of NASA, the Space Task Group (STG) was created to implement **Project Mercury**, the first U.S. Manned Space Program. The goals of Project Mercury were to place a manned spacecraft in orbital flight around the Earth; to investigate man's performance capabilities and his ability to function in the environment of space; and to recover the man and the spacecraft safely (Williams et al. 1963:2). Over the course of the program, NASA successfully designed a vehicle that could survive the conditions of space, as well as atmospheric reentry; hired and trained the first U.S. astronauts; developed a worldwide tracking network; and created mission control procedures that became the protocol for all future programs. Twenty-six manned and unmanned missions were launched as part of Project Mercury between August 1959 and May 1963. Seventeen of the missions, including all six of the manned flights, launched from LC 5/6 and LC 14 at CCAFS; the other nine lifted off from Wallops Island, Virginia. Despite the pace of Project Mercury, the U.S. was unable to beat the Russians, who had successfully launched cosmonaut Yuri Gagarin into space on April 12, 1961; Alan B. Shepard, Jr.'s flight occurred on May 5, 1961.

Project Gemini unofficially got its start during 1959, when NASA began to plan a follow-up program to Project Mercury. Ideas included a two-man capsule, extended duration flights (up to two weeks), a manned lunar expedition, and a manned orbiting laboratory. In early January 1961, a firm decision was made by NASA to “plan an Earth-orbital rendezvous program independent of, although contributing to, the manned lunar program,” which became especially important after President Kennedy charged NASA with landing on the Moon by the end of 1969 (Grimwood and Hacker 1969). As the intermediate step between Project Mercury and the Apollo Program, the primary objective of Project Gemini was to prepare for a lunar landing. As such, its goals were to keep a two-man crew in space for up to 14 days; rendezvous and dock with orbiting vehicles, and maneuver the combination; and to perfect methods of entering the atmosphere and landing (NASA KSC 2000). Gemini flew 12 missions between April 1964 and November 1966, all but the first two manned. The program met all of its goals, including the production of a two-man vessel, the first successful extravehicular activity, the first vehicle rendezvous and docking sequence, and the longest flight duration, 14 days, as of that date. All 12 missions launched from LC 19 at CCAFS.

On May 25, 1961, President John F. Kennedy proposed the following historic goal before a joint session of the Congress:

Now is the time to take longer strides--time for a great new American enterprise, time for this nation to take a clearly leading role in space achievement, which in many ways may hold the key to our future on Earth...I believe this nation should commit itself to achieving the goal, before this decade is out, of landing a man on the Moon and returning him safely to the Earth (Butowsky 1981:4).

The **Apollo Program** was the largest and most ambitious of the Manned Space Programs, with the goal of landing astronauts on the Moon and returning them safely to Earth. Three different launch vehicles were used in Apollo: Saturn I, Saturn IB and Saturn V. The unmanned Apollo 4 mission, launched on November 9, 1967, was the first Saturn V launch and the first launch from KSC. On July 20, 1969, the goal of landing a man on the Moon was achieved when Apollo 11 astronauts Armstrong, Aldrin, and Collins successfully executed history’s first lunar landing. Armstrong and Aldrin walked on the surface of the Moon for two hours and thirty-one minutes, and collected 21 kilograms of lunar material. Apollo 17, the final launch of the Apollo Program, was the first night launch in December 1972. An estimated 500,000 people saw the liftoff (NASA 1994). Altogether, seven Apollo missions launched from LC 34 and eight from LC 37 at CCAFS, and 17 launched from LC 39 at KSC, including Skylab and the Apollo-Soyuz Test Project (ASTP). Of the total 32 missions, 15 were manned, and of the seven attempted lunar landing missions, six were successful (NASA 1994). No major launch vehicle failures of either Saturn IB or Saturn V occurred. There were two major command/service module failures, one on the ground (Apollo 1) and one on the way to the Moon (Apollo 13) (NASA 1994:82).

Skylab, an application of the Apollo Program, served as an early type of space station. With 12,700 cubic feet of work and living space, it was the largest habitable structure ever placed in orbit as of that date. The station achieved several objectives: scientific investigations in Earth orbit (astronomical, space physics, and biological experiments); applications in Earth orbit (Earth resources surveys); and long-duration spaceflight. Saturn V and Saturn IB rockets were used (NASA 1994:91).

The ASTP of 1975, the final application of the Apollo Program, marked the first international rendezvous and docking in space, and the first major cooperation between the only two nations (the U.S. and USSR) engaged in manned space flight. This project established workable joint docking mechanisms, taking the first steps toward mutual rescue capability of both Russian and American manned missions in space (NASA 1994:96).

On January 5, 1972, President Richard M. Nixon delivered a speech in which he outlined the end of the Apollo era and the future of a reusable space flight vehicle, the **Space Shuttle**, which would provide “routine access to space.” By commencing work at this time, Nixon added, “we can have the Shuttle in manned flight by 1978, and operational a short time after that” (Lindroos 2000). The new STG, established by President Nixon in February 1969, had recommended three choices of long-range space plans. All included an Earth-orbiting space station, a space shuttle, and a manned Mars expedition (NASA Headquarters 1969). Although none of the original programs presented was eventually selected, NASA implemented a program, shaped by the politics and economic realities of its time that served as a first step toward any future plans for implementing a space station (Jenkins 2001).

The Space Transportation System (STS; commonly referred to as the Space Shuttle) consisting of a reusable orbiter, three reusable main engines (SSMEs), two reusable solid rocket boosters (SRBs), and one expendable external liquid fuel tank (ET). NASA’s administrators vowed that the Space Shuttle would fly at least 50 times a year, making space travel economical and safe. NASA gave responsibility for developing the Space Shuttle’s orbiter vehicle and overall management of the Space Shuttle Program (SSP) to the Manned Spacecraft Center (now Johnson Space Center [JSC]) in Houston, Texas, based on the Center’s experience. MSFC in Huntsville, Alabama, was responsible for development of the SSME, the SRBs, the ET, and for all propulsion-related tasks. Engineering design support continued at JSC, MSFC, and NASA’s Langley Research Center, in Hampton, Virginia, and engine tests were to be performed at NASA’s National Space Technology Laboratories (later named Stennis Space Center) in south Mississippi, and at the Air Force’s Rocket Propulsion Laboratory in California, which later became the Santa Susana Field Laboratory (Jenkins 2001). NASA selected KSC as the primary launch and landing site for the SSP. KSC, responsible for designing the launch and recovery facilities, was to develop methods for shuttle assembly, checkout, and launch operations (Ezell 1988; Williamson 1999).

On September 17, 1976, the full-scale Orbiter Vehicle (OV) prototype *Enterprise* (OV-101) was completed. Designed for test purposes only and never intended for spaceflight, structural assembly of OV-101 had started more than two years earlier in June 1974 at Air Force Plant 42 in Palmdale, California. Although the *Enterprise* was an aluminum shell prototype incapable of space flight, it reflected the overall design of the orbiter. As such, it served successfully in 1977 as the test article during the Approach and Landing Test Program, aimed at checking out both the mating with the Boeing 747 Shuttle Carrier Aircraft for ferry operations, as well as the orbiter’s unpowered landing capabilities.

The first orbiter intended for spaceflight, *Columbia* (OV-102), arrived at KSC from the Palmdale assembly facility in March 1979. Originally scheduled for liftoff in late 1979, the launch date was delayed by problems with both the SSME components as well as the thermal protection system. *Columbia* spent 610 days in the Orbiter Processing Facility, another 35 days in the Vehicle Assembly Building (VAB) and 105 days on Launch Pad 39A before lifting off on April 12, 1981. STS-1, the first orbital test flight and first SSP mission, ended with a landing on April 14, 1981, at Edwards Air Force Base in California. This launch demonstrated *Columbia*’s ability to fly into orbit, conduct on-orbit operations, and return safely (Jenkins 2001). *Columbia* flew three additional test flights in 1981 and 1982, all with a crew of two. The Orbital Test Flight Program ended in July 1982 with 95 percent of its objectives accomplished. After the end of the fourth mission, President Reagan declared that with the next flight the Shuttle would be “fully operational.”

During the SSP, a total of 135 missions were launched from KSC. From April 1981, until the *Challenger* accident in January 1986, between two and nine missions were flown yearly, with an average of four to five per year. The milestone year was 1985, when nine flights were successfully

completed. The years between 1992 and 1997 were the most productive, with seven or eight yearly missions. Since 1995, in addition to its unique responsibility as the Shuttle launch site, KSC also became the preferred landing site.

Over the past three decades, the SSP has launched a number of planetary and astronomy missions including the Hubble Space Telescope, the Galileo probe to Jupiter, Magellan to Venus, and the Upper Atmospheric Research Satellite. In addition to astronomy and military satellites, a series of Spacelab research missions were flown, which carried dozens of international experiments in disciplines ranging from materials science to plant biology. Spacelab was a manned, reusable, microgravity laboratory flown into space in the rear of the Space Shuttle cargo bay. It was developed on a modular basis allowing assembly in a dozen arrangements depending on the specific mission requirements (NASA 1988). The first Spacelab mission, carried aboard *Columbia* (STS-9), began on November 28, 1983. Four Spacelab missions were flown between 1983 and 1985. Following a stand-down in the aftermath of the *Challenger* accident, the next Spacelab mission was not launched until 1990. In total, 24 Space Shuttle missions carried Spacelab hardware before the program was decommissioned in 1998 (NASA KSC 2002).

In 1995, a joint U.S./Russian Shuttle-*Mir* Program was initiated as a precursor to construction of the International Space Station (ISS). *Mir* was launched in February 1986 and remained in orbit until March 2001 (Reichhardt 2002). The first approach and fly around of *Mir* took place on February 3, 1995 (STS-63); the first *Mir* docking was in June 1995 (STS-71). During the three-year Shuttle-*Mir* Program (June 27, 1995 to June 2, 1998), the Space Shuttle docked with *Mir* nine times. The Orbiter *Atlantis* flew all but the last two of these docking missions. In 1995, Dr. Norman Thagard was the first American to live aboard the Russian space station. Over the next three years, six more U.S. astronauts served tours on *Mir*. The Shuttle served as a means of transporting supplies, equipment, and water to the space station in addition to performing a variety of other mission tasks, many of which involved Earth science experiments. It returned to Earth experiment results and unneeded equipment. The Shuttle-*Mir* Program served to acclimate the astronauts to living and working in space. Many of the activities carried out were types they would perform on the ISS (Rumerman and Garber 2000).

On December 4, 1998, *Endeavour* (STS-88) launched the first U.S. component of the ISS into orbit. This event marked, “at long last the start of the Shuttle’s use for which it was primarily designed – transport to and from a permanently inhabited orbital space station” (Williamson 1999:191). STS-96, *Discovery*, launched on May 27, 1999, marked the first mission to dock with the ISS. Since that time, most Space Shuttle missions supported the assembly of the space station. The last major component of the ISS was delivered in May 2011, during the final flight of *Endeavour* (STS-134).

The SSP suffered two major setbacks with the tragic losses of the *Challenger* and *Columbia* on January 28, 1986, and February 1, 2003, respectively. Following the *Challenger* accident, the program was suspended, and President Ronald Reagan formed a 13-member commission to identify the cause of the disaster. The Rogers Commission Report, issued on June 6, 1986, which also included a review of the SSP, concluded “that the drive to declare the Shuttle operational had put enormous pressures on the system and stretched its resources to the limit” (Columbia Accident Investigation Board [CAIB] 2003:25). In addition to mechanical failure, the Commission noted a number of NASA management failures that contributed to the catastrophe. As a result, among the tangible actions taken were extensive redesign of the SRBs; upgrading of the Space Shuttle tires, brakes, and nose wheel steering mechanisms; the addition of a drag chute to help reduce speed upon landing; the addition of a crew escape system; and the requirement for astronauts to wear pressurized flight safety suits during launch and landing operations. Other changes involved reorganization and decentralization of the SSP. NASA moved the management of the program from JSC to NASA

Headquarters, with the aim of preventing communication deficiencies (CAIB 2003). Experienced astronauts were placed in key NASA management positions, all documented waivers to existing flight safety criteria were revoked and forbidden, and a policy of open reviews was implemented (Lethbridge 2001). In addition, NASA adopted a Space Shuttle flight schedule with a reduced average number of launches and discontinued the long-term practice of launching commercial and military payloads (Lethbridge 2001). The launch of *Discovery* (STS-26) from Launch Pad 39B on September 29, 1988, marked a Return-to-Flight after a 32-month stand-down in manned spaceflight following the *Challenger* accident.

In the aftermath of the 2003 *Columbia* accident, a seven-month investigation ensued, concluding with the findings of the CAIB, which determined that both technical and management conditions accounted for the loss of the orbiter and crew. According to the Board's Report, the physical cause of the accident was a breach in the thermal protection system on the leading edge of the left wing, caused by a piece of insulating foam, which separated from the ET after launch and struck the wing (CAIB 2003). NASA spent more than two years researching and implementing safety improvements for the orbiters, SRBs and ET. Following a two-year stand-down, the launch of STS-114 on July 26, 2005, marked the first Return-to-Flight since the loss of *Columbia*.

On January 14, 2004, President George W. Bush outlined a new space exploration initiative in a speech given at NASA Headquarters.

Today I announce a new plan to explore space and extend a human presence across our solar system . . . Our first goal is to complete the International Space Station by 2010 . . . The Shuttle's chief purpose over the next several years will be to help finish assembly of the International Space Station. In 2010, the Space Shuttle – after nearly 30 years of duty – will be retired from service. . . (Weekly Comp. Pres. Docs 2004).

Following the President's speech, NASA released *The Vision for Space Exploration*, which outlined the Agency's approach to the new direction in space exploration (NASA 2004). As part of this initiative, NASA decided that the Space Shuttle would not be upgraded to serve beyond 2010 and, after completing the ISS, the SSP will be retired.

2.2 The NASA KSC Railroad System and Jay Jay Bridge

With the goal set by President Kennedy to land a man on the Moon by the end of the 1960s, and the decision to use the powerful Saturn V launch vehicle, it was apparent that a new launch complex was required, and CCAFS, already with 22 launch complexes, did not have available land for new rocket facilities. Merritt Island, an undeveloped area west and north of the Cape, was investigated along with eight other sites in Florida, Georgia, Texas, the Bahamas, Hawaii, and New Mexico. The Merritt Island site won this competition and in 1961, the Merritt Island Launch Area (MILA) was established (NASA 1992:3.1). Eventually, MILA incorporated the Launch Operations Center as part of its jurisdiction; the entirety was renamed the John F. Kennedy Space Center in November 1963 following the death of the President (Benson and Faherty 2001).

The U.S. Army Corps of Engineers (ACOE) acted as agent for purchasing land, and NASA began gaining title to the land in late 1962, taking over 83,903.9 acres by outright purchase. Included in this purchase were several small towns, such as Orsino, Wilson, Heath and Audubon, in addition to farms, citrus groves, and several fish camps. Negotiations with the State of Florida provided submerged lands, resulting in the acquisition of property identified on the original Deed of Dedication. Much of the State-provided land was located south of the Old Haulover Canal and north of the Barge Canal.

With the newly purchased land, NASA designed a “Spaceport,” formulated around the requirements of the Apollo Program. The original master plan for the center depicted a railroad system, to be used as a means “to provide railroad car delivery of construction supplies,” and later for “delivery of operations and maintenance supplies and equipment in connection with [Apollo] launches” (*Spaceport News* 1963a).

Circa 1962, NASA and the ACOE reached an agreement with the Florida East Coast Railway (FEC) for the construction and operations of a railroad system within KSC. The FEC had its beginning on December 31, 1885, when Henry M. Flagler purchased the Jacksonville, St. Augustine & Halifax River Railway, a 38-mile line that ran from Jacksonville to St. Augustine. Over the next few years, Flagler expanded his holdings along Florida’s East Coast through the acquisition of existing lines and the construction of new lines; by 1889, he had assembled enough railroad track for a mainline between South Jacksonville and Daytona (Bramson 1984; Johnston and Mattick 2001; Pettengill 1952). Following additional acquisitions and expansions, on September 13, 1895, the Flagler system was officially organized as the Florida East Coast Railway Company. Further purchases and the laying of new track brought Flagler’s system as far as Miami; the FEC extended its line to Key West by 1912 (Bramson 1984; Morgan 1975; Johnston and Mattick 2001). Another major extension, begun in 1911, was the Okeechobee Branch, which ran for roughly 123 miles from Maytown in Volusia County to Lake Harber, where it connected to the Atlantic Coast Line Railroad (see **Figure 2-1**) (Bramson 1984; Johnston and Mattick 2001).

During its early years, the bulk of the FEC’s business was the transporting of passengers, citrus fruits, and vegetables. With the Florida Land Boom of 1924, the FEC’s business exploded, and as a result, the railway company invested \$45 million to construct new branch lines, yards, and other facilities. However, as the boom began to collapse, so did the fortunes of the FEC, and in 1931, the FEC began a three-decade long struggle with bankruptcy (Bramson 1984; Morgan 1975). Among its problems, the railway company had an excess of both track and diesel locomotive maintenance shops, as well as trouble with its safety record, operating ratio, and the employee’s union. Shortly after the time when NASA and the ACOE were negotiating with the FEC, the railway company’s problems with the union came to a head. On January 23, 1963, FEC employees began a strike over management’s refusal to honor an industry-wide pay raise. For almost nine years, court battles, negotiations, political pressures, regulatory rulings, and acts of sabotage clouded FEC’s daily operations, until December 1971, when FEC finally reached an agreement with its workers (Bramson 1984; Morgan 1975).

Per their agreement with NASA, the FEC would construct an approximately 7.5 mile long railroad extension from their track at the Titusville/Cape Canaveral Junction on the west shore of the Indian River to Wilson’s Corner, located near the intersection of State Road 3 and State Road 402. Included in the agreement was the construction of the Jay Jay Bridge, a single-leaf, bascule bridge, that would carry the railroad track across the Indian River. The FEC also was contracted to build a seven-track yard, the Jay Jay Yard, at the Cape Canaveral Junction in Titusville, and a second, seven-track yard, the Wilson Yard, just west of Wilson’s Corner (NASA 2007). The railroad was constructed of 100- or 112-pound jointed steel rail with wood crosssties and limestone ballast; all materials except for the ballast were materials the FEC salvaged when it removed its mainline double track ca. 1961 (Hoffman 2012a).

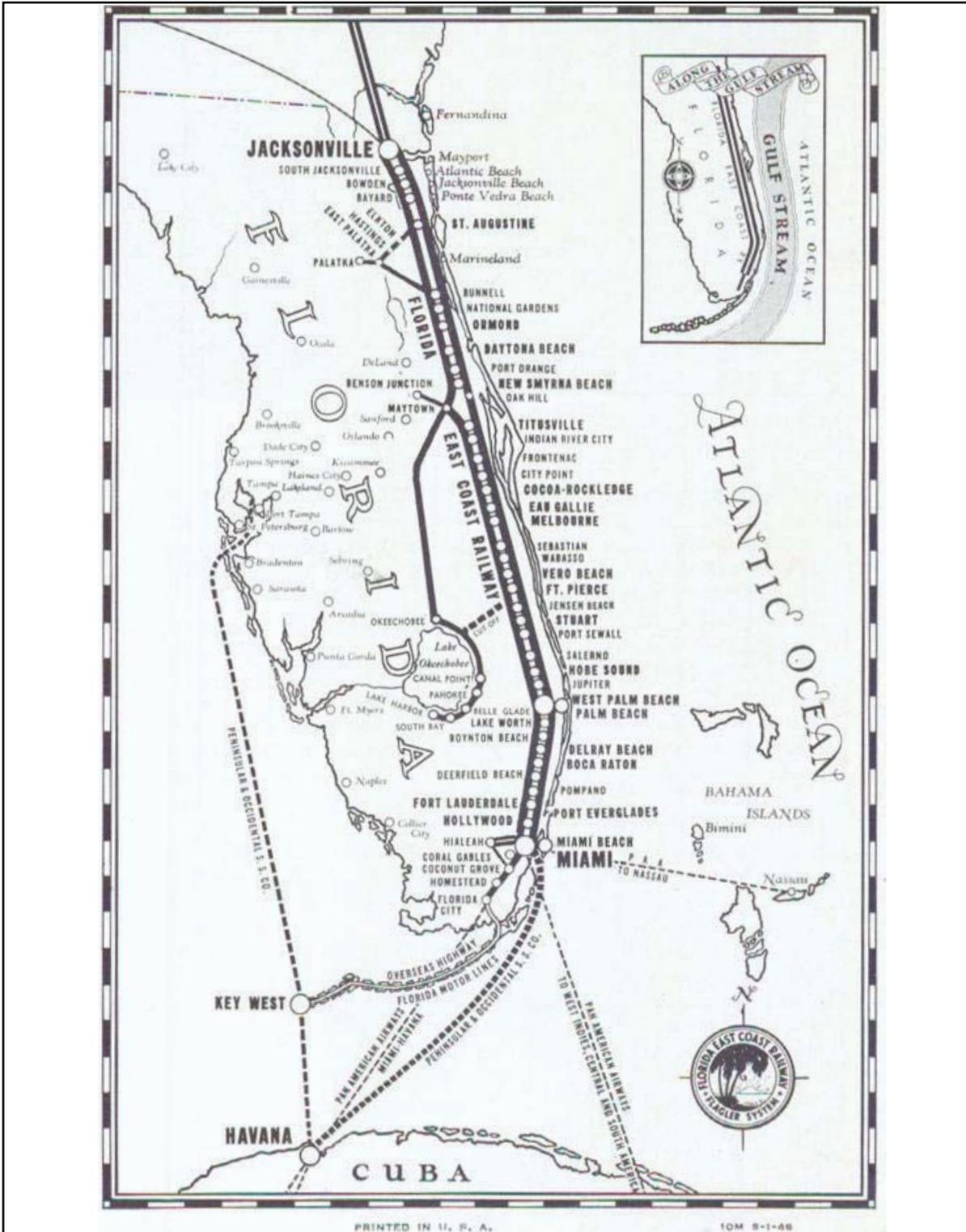


Figure 2-1. Map of the FEC Railway System circa 1946. Source: Florida East Coast Railway (1946), *The Story of a Pioneer*, p. 40.



The ACOE maintained responsibility for the construction of an approximately 28-mile rail system in what would become the approximate 3,800-acre restricted area of KSC (see **Figure 2-2**). The system consisted of two tracks, which split just east of Wilson’s Corner. One track, known as the east branch, extended eastward toward the Atlantic Ocean (Playalinda Beach), before turning southeast to pass by Launch Pads 39A and 39B and extending to the boundary between KSC and CCAFS. There it connected to 22 miles of track at the CCAFS Titan Launch Complex (*Spaceport News* 1984b). The second track, known as the west branch, traveled south from Wilson’s Corner, past the VAB Area, and into the Industrial Area of KSC (*Spaceport News* 1963a). Like the FEC portion of the railroad, the sections within the restricted area were 100- or 112-pound jointed rail with wood crossties and limestone ballast. The ACOE, however, paid for all new materials, although it was later discovered that the contractors used salvaged materials (Hoffman 2012a).

On June 20, 1963, the ACOE opened bids for the construction of the KSC railroad system. The lowest bid for roughly \$2.4 million was submitted by A. S. Wickstrom, Inc., of Skaneateles, New York. However, the contract was awarded to the joint venture of B. B. McCormick and Bailes-Sey of Jacksonville, Florida, at a cost of around \$2.5 million. The contract called for completion within 180 calendar days (about January 1964), which coincided with the scheduled delivery of large quantities of steel for the VAB (*Spaceport News* 1963b, 1963c). However, because of the FEC labor strike, the NASA KSC railroad was not completed in its entirety until 1965 (*Spaceport News* 1964).



Photo 2-1. Railroad construction in the Industrial Area, April 22, 1965.
Source: KSC Archives, Negative No. 100-KSC-65-7729.

At the outset of construction, NASA, as well as the Air Force, projected 300,000 carloads of materials to be delivered to KSC by the railroad over the first five years, including the river rock for the Crawlerway. Based on this figure, the FEC agreed to supply the money for the construction, operation, and maintenance of their 7.5-mile section, as well as the operation and maintenance of the 28-mile portion built by NASA/ACOE; the funds were to come from a “modest switching charge” for the shipment of the loaded railcars. By 1969, the actual traffic over the railroad amounted to only around 10 percent of the projected totals, most of which was along the west branch (Hoffman 1983).

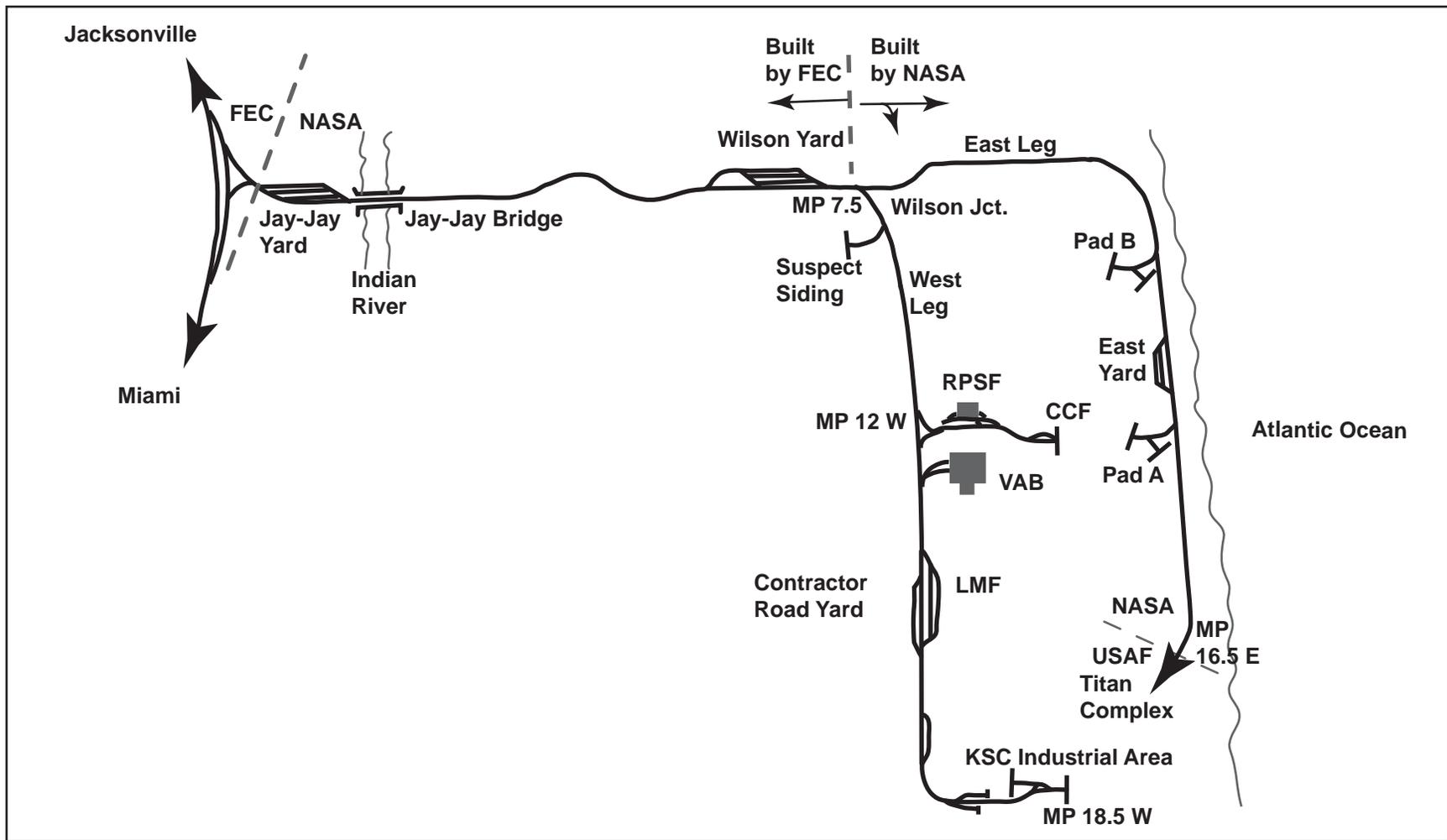


Figure 2-2. Schematic of the NASA KSC Railroad System. Source: KSC-TO, no folder.



This led the FEC to file a lawsuit against NASA over lost revenue; the lawsuit would not be settled until 1983 (KSC-TO n.d.; Hoffman 2012a).

The railroad remained as originally designed and constructed until 1974, when a temporary railroad spur, about 1 mile long, was constructed from the west branch to the Shuttle Landing Facility (SLF). The tracks were used by the SLF contractors to bring rough aggregate and cement into KSC for the construction of the SLF Runway. Railroad cars hauled an estimated 500,000 barrels of cement for the 15,000-foot (ft) long, 300-ft wide landing strip (*Spaceport News* 1974).



Photo 2-2. Delivery of construction materials for the SLF via the Railroad, August 4, 1975.
Source: KSC Archives, Negative No. 108-KSC-375C-10046.8.

The advent of the SSP also “renewed interest in rail transportation as the most practical method of shipping the SRB segments” (*Spaceport News* 1984b:6-7). Each Space Shuttle carried twin SRBs, each comprised of both motor and non-motor segments. The solid rocket motor (SRM) consisted of four motor segments, which contained the fuel to power the SRBs. The SRMs were manufactured by the Thiokol Company in Utah; Thiokol also refurbished the SRMs and reloaded them with propellant following launch and recovery. The major non-motor segments included the nose cap, frustum, and forward and aft skirts. These structural components contained the electronics to guide the SRBs during liftoff, ascent, and ET/SRB separation, and housed the parachutes, which slowed the descent of the reusable boosters into the Atlantic Ocean after their jettison from the spacecraft.

Because of the size of the SRM segments (12-ft diameter and approximately 150-tons each), and hazardous nature, shipment by rail between Utah and KSC was the only practical means of transportation (Heiney 2011). Thus, in 1977, a spur was constructed from the west branch of the railroad into the two west VAB high bays for the delivery of SRB motor segments. The subcontractor for the work was a private firm called Kennedy Railroad of Harrisburg, Pennsylvania; ironically, the president of the company was John Kennedy (*Spaceport News* 1977). The spur was ready for use in 1978.



Photo 2-3. Construction of Railroad spur into the VAB, May 1977.
Source: *Spaceport News*, May 27, 1977, page 1.

In the mid-1970s, KSC's Design Engineering branch developed the layout for the locomotive maintenance facility (LMF), which was constructed south of the VAB along Contractor Road. As part of the effort, in 1978, KSC purchased an old Army Signal Corps car (U.S. Army 87325) for use as an office/tool room. The car was constructed during World War II as a hospital car, and remodeled in 1950 as the "Presidential Communications Car" that accompanied the "Ferdinand Magellan" armored Presidential Pullman whenever the U.S. President travelled by train. U.S. Army 87325, which became NLAX 150 upon its purchase by NASA, was retrofitted for duty by the newly hired railroad crew, which became part of the new Transportation Operations team within KSC. Aside from railroad support, the railroad crew operated heavy-duty tractor trailer trucks. Other tasks of the Transportation Operations team included the maintenance of payload containers used to ship Space Shuttle payloads between their worldwide manufacturing and assembly/checkout facilities and KSC (*Spaceport News* 1978).

In the early 1980s, railroad operations increased to the point that almost daily round trips to the Jay Jay Yard were necessary to pick up and deliver cars to FEC's mainline connection. In many instances, there were simultaneous runs of two locomotives and dual train crews, as the trains were typically 10 and 20 cars long (*Spaceport News* 1984b). Around the same time, KSC technicians made the decision to move SRB operations from the VAB to a separate facility, what would become the Rotation, Processing, and Surge Facility (RPSF), located to the north of the VAB. The RPSF was a complex of three buildings, one of which, the Rotation/Processing Building (RPB), was specifically

constructed for rotating the SRM segments from horizontal, as delivered, to vertical, for stacking. Construction of the RPB occurred between 1982 and 1984. To assist in the delivery of the SRM segments, a 115-ton railroad track was constructed through the RPB, allowing KSC locomotives to transport segments directly to the facility (ACI 2007; KSC Archives 1982).

In June 1983, after the legal battle following the FEC's 1969 lawsuit, NASA purchased the 7.5-mile spur west of Wilson's Corner, and undertook the complete operation and maintenance of the railroad, including the tracks, the Jay Jay Bridge, and crossings. Unfortunately, portions of the railroad were in poor condition after over 15 years of exposure to the salty air and moist climate. Many of the wood cross ties were rotting, rust had eaten away much of the hardware, and the rail required strengthening to safely handle the hazardous loads. At that point, a three-year railroad repair project was implemented (Hoffman 1983; KSC Archives 1981, 1983; *Spaceport News* 1984b; Heiney 2011).

The first step was hiring the Railroad Track Construction Corporation, a subsidiary of the FEC, to repair the tracks, bridge, and crossing signals. This included the replacement of more than six miles of track along the Atlantic Ocean, which had succumbed to rust. When originally constructed, the rail segments were bolted together. During the repairs, 1,000-ft segments of continuous welded rail replaced the original. Between 1984 and 1986, over 35,000 new, lower maintenance concrete cross ties were installed, principally in the west branch, which amounted to approximately one-third of the total ties. Wood cross ties were left at all track switches due to the flexibility of the material (Chesson 2012; KSC Archives 1983). Repair of a 5-mile portion of track along the Atlantic Ocean, between mileposts 11.0E and 16.5E, was completed in June 1984 (KSC Archives 1984, 1987). The track within the Jay Jay Yard and between mileposts 1.0 and 7.5 was completed in 1986 (KSC Archives 1985, 1987). The west branch of the railroad, from mileposts 7.5 and 18.5W, was completed in 1991 (KSC Archives 1991).

Between September and December 1984, the FEC's Railroad Track Construction Company also repaired all road crossings associated with the NASA KSC railroad. When possible, workers used preassembled sections of track and cross ties to expedite the process (*Spaceport News* 1984a). Most of the work occurred on the weekends, under the supervision of David Hoffman, NASA's Railroad Manager (*Spaceport News* 1984b, 1985).



Photo 2-4. Delivery of the last SRM segments to KSC, May 28, 2010.
Source: KSC Multimedia Library, Negative No. KSC-2010-3651.

The NASA KSC Railroad System supported the SSP for three decades by transporting fueled SRM segments from Utah, and by returning spent SRM segments from KSC to Utah. The first set of SRM segments arrived in March 1978; the final set arrived in May 2010. The SRM segments were delivered by the FEC to the Jay Jay Yard, southeast of Mims, where NASA's locomotives retrieved the segments. Prior to moving the segments, technicians thoroughly examined the cars for hazards and installed spacer cars between the segment cars to evenly distribute the weight of the train over the Jay Jay Bridge. The load was carried to the Wilson Yard, where the spacer cars were removed, and the segments were transported to the Suspect Siding, an isolated staging area on the northeast side of the SLF. The cars stayed in this location until the technicians within the RPSF were ready for the segments (Heiney 2011).

The railroad also was used to transport ground support equipment and construction materials, and conveyed fuel and oxidizer to CCAFS (Heiney 2011; *Spaceport News* 2001). It also served to carry nitrogen tetroxide (an oxidizer), Air Force Titan rockets, Navy Trident missiles, and the SRM segments for the Ares I-X flight test in March 2009 (Heiney 2011). The major commodities delivered by rail during the Apollo era were construction materials for the Crawlerway and other facilities, and liquid helium, used for purging fuel lines at the launch pad.

Jay Jay Railroad Draw Bridge

The Jay Jay Bridge, constructed ca. 1963, is a single-leaf bascule that spans a distance of approximately 0.5 miles across the Indian River. The approach spans were designed by Maurice H. Connell and Associates of Miami, Florida; the bascule main span was designed and assembled by the Nashville Bridge Company. L.O. Hopkins of Nashville, Tennessee, designed the channel piers and fenders. The as-built drawings indicate that fill was dredged from the bottom of the Indian River due south of the bridge to create an approximately 1,500-ft long peninsula on the west side of the river and an approximately 2,000-ft long peninsula on the east (Maurice H. Connell and Associates & Nashville Bridge Company 1963).



Photo 2-5. Construction of the Jay Jay Bridge, 1963.
Source: KSC Archives, Negative No. LOC-63-8518.

During the Apollo Program era, materials used to construct KSC were carried across the bridge. SRM segments first crossed the Jay Jay Bridge in 1978 before the first flight of the SSP in 1981 (Stephens 2012b). Following purchase from the FEC in June 1983, the Jay Jay Bridge underwent much needed repairs. The channel lights and deteriorated bridge fenders were repaired in early 1985 by Inter-Bay Marine Construction, and later that year the electrical system was rewired. The bridge was closed for seven days in early 1987 as a subcontractor, Ivey's Steel Erectors, replaced a deteriorated span (*Spaceport News* 1987). In mid-1989, EG&G workers sandblasted and painted the bridge, work that limited boat passage to every hour and half-hour during the workday. By August of that year, seven spans had been reinforced (*Spaceport News* 1989).

In 1993, the electrical system was reconfigured, and it has been updated since then. The exterior shell of the Control House was replaced in March 2008. Several more repairs have been made to the bridge over the years, including the installation of pile jackets; replacement of the track, ties, railing, walkways, piles, and fender system; and corrosion control and repainting (Washburn 2012a, 2012b).

Locomotives

NASA KSC railroad operations in support of the SSP began with the acquisition of two Alco S-2 diesel locomotives. The 115-ton capacity locomotives were designed for heavy duty road and switching service. Originally manufactured in 1942 by the American Locomotive Company and used by the U.S. Army, they were purchased by NASA in January 1976 as Department of Defense (DoD) excess property for \$111,870 from the Defense Property Disposal Office, Seneca Army Depot in New York. In addition to transporting SRM segments, the locomotives were used to move other cars and for operations previously accomplished with the KSC carspotter. Following purchase, the locomotives were overhauled in June 1978 by Johnson Railway Service, Inc. at their shop in Cornelia, Georgia. The locomotives were painted black and white prior to their delivery to KSC in July 1978.

On July 24, 1984, NASA acquired three used, as-is, multi-purpose switching locomotives made by General Motors' Electro-Motive Division (EMD) and powered by a EMD 645 engine. These model SW-1500 diesel locomotives were built in 1968 (Locomotive 1) and 1970 (Locomotives 2 and 3), and originally were owned by the Toledo, Peoria and Western Railroad (TP&W) as numbers 303, 305, and 306, respectively. With this purchase, the two older Alco S-2 units were declared surplus. The new SW-1500 locomotives contained most of the same parts as the FEC's newest locomotives, ensuring the availability of spare parts and maintenance assistance from the FEC.

Once purchased, the locomotives, known simply as **Locomotives 1, 2, and 3**, were scheduled for minor repairs and a tune-up by the railroad crew, staffed by EG&G under the KSC Base Operations contract. They were then painted in the NASA KSC railroad red, black, and gray color scheme (*Spaceport News* 1984b). The railroad crew used the locomotives for hauling SRM segments, specialized ground support equipment (GSE), and helium and other launch service commodities. In 2004, Locomotive No. 1 received a custom-built lube system designed by the railroad crew, due to a lubrication failure preventing the crankshaft and bearings from receiving oil. Because the vehicle had to be disassembled down to the engine block, other major maintenance was completed at the same time (Diller 2004). In 2008, Locomotive 3 was painted black, blue, and white with red stripes as a result of a 15-month corrosion repair project (*Spaceport News* 2008).

Freight Cars

Throughout the history of the NASA KSC Railroad System, various freight cars were purchased and sold by the Center. As of the field survey in January 2012, there were 75 railroad cars within the

NASA KSC Railroad System, including 34 flat cars, 13 helium cars, 11 hopper cars, eight tank cars, six gondolas, two cover cars, and one box car. Most of the railcars originally were built in the 1950s and 1960s. NASA acquired some of the rolling stock through purchase from railroads that were going out of business; other railcars were acquired by NASA as surplus government property. Most of the purchases from private companies date from 1981 to 1985, at the beginning of the SSP; acquisitions from other federal agencies occurred ca. 1998 (Crews 2012). In general, the railcars were used to support the SSP or to construct and maintain KSC. Some were used for their parts to modify other KSC railcars.

The 34 **flat cars** were used to either haul materials or served as spacer cars to better distribute train weights. Four specialized cars fall within the flat car category: the aft skirt cars, NLAX 170 and NLAX 171, plus the cover cars, NLAX 153 and NLAX 154. Fourteen of the 34 flatcars originally were built for the Army ca. 1952 and transferred to NASA ca. 1998 (KSC-TO 1985).

The 13 identical **helium cars** were built ca. 1961 and originally owned by the U.S. Bureau of Land Management. Each car transported tanks to and from Federally-operated helium mines in Texas. NASA acquired the cars after helium mining was privatized in the U.S. in the 1990s (KSC - TO, Folder No. MHAX Cars). NASA used the cars to store helium until the final Shuttle launch in 2011(Stephens 2012b).

The 11 **hopper cars** carried aggregates such as rocks and were used in KSC construction and maintenance projects. Ten were purchased in the early 1990s in preparation for the refurbishment of the Crawlerway; they carried the river rock into KSC. NLAX 914, a 100-ton, triple-hopper railroad car, was used solely for parts to refurbish the other hopper cars (Crews 2012).

The eight **tank cars** held hydrogen and water, among other liquids. NLAX 201 and 202, the two hydrogen cars, were built new for NASA in the 1960s, while the others likely were once owned by the DoD (KSC-TO, Folder No. LH2 Railcar Maintenance and Storage).

The six **gondolas** were used to support the SSP and to maintain the track at the KSC. NLAX 175 and NLAX 176 were once part of the Rock Island Railroad, and specially designed racks were placed within their decks so they could transport SRM end rings (KSC-TO, Folder No. 6670-5-175). NLAX 100 was a Pullman prototype logging gondola used to ship bulky objects (Hoffman 2012b).

The two **cover cars**, NLAX 153 and NLAX 154, were built in 1960 and acquired by NASA in 1981 and 1982. They were used to transport SRM segments.

The sole **boxcar**, NLAX 4005, carried materials within the NASA KSC Railroad System. It also was used for storage during rebuild projects (Stephens 2012b).

3.0 SURVEY RESULTS

3.1 Overview

During field survey in January 2012, a total of 81 assets were identified as part of the NASA KSC Railroad System. These historic resources include the roughly 38 miles of railroad track (8BR2931), the Jay Jay Bridge (8BR2906), the three locomotives (8BR2923, 8BR3043, 8BR3044), 75 pieces of rolling stock divided into 23 types (8BR2907 through -2922, 8BR2924 through -2930 and 8BR3042), and the Locomotive Maintenance Facility (8BR3035). Multiple railcars of the same type share a single Florida Master Site File (FMSF) number. All identified resources were evaluated to determine their eligibility for listing in the NRHP, either individually or as part of a historic district. While none of the 81 assets was assessed as individually eligible, a portion of the railroad track, the Jay Jay Bridge, the three locomotives, and two railcars (NLAX 170 and NLAX 171) are considered contributing resources to the newly identified NRHP-eligible NASA KSC Railroad System Historic District (8BR2932).

Summary descriptions and evaluations of the identified historic resources follow. Completed FMSF forms are provided in **Appendix A**, and a NRHP Registration Form for the Historic District is contained in **Appendix B**.

3.2 NASA KSC Railroad Track (8BR2931)

The NASA KSC Railroad Track is a standard gauge industrial short line, with an approximate total length of 38 miles. Originally, the line was constructed of 100- or 112-pound jointed rail with wood crossties and limestone ballast (**Photo 3-1**). Circa 1983, NASA installed 132-pound continuous-welded rail and a combination of concrete and wood crossties, “because of the hazardous commodities hauled over the railroad, particularly the solid rocket boosters for the space shuttle” (NASA 2007). The original limestone ballast was replaced with granite in the mid-1980s (KSC Archives 1983).



Photo 3-1. Representative view of rail, crossties and ballast, 2012.
Source: Archaeological Consultants, Inc., January 2012.

The west boundary of the NASA KSC Railroad Track is the point where the track meets the FEC line in Titusville. Just to the east of this junction is the Jay Jay Yard, a four-track yard, which was reduced from the original seven-track yard ca. 1986 (KSC Archives 1986). From Jay Jay Yard, the NASA KSC railroad crosses the Indian River via the Jay Jay Bridge (8BR2906). The track then extends east for approximately 7 miles to Wilson's Corner (roughly the intersection of State Highway 402 and Kennedy Parkway North). Along the way, there are two yards, the West Wilson Yard, which consists of two tracks, and the Wilson Yard, which consists of four tracks.

At Wilson's Corner, the railroad splits into two branches: an east branch and a west branch. The east branch, with a length of about 9 miles, extends eastward to Playalinda Beach, and then curves southeast to parallel the Atlantic coastline. From this branch, there is a small spur (roughly 0.2 miles) that extends to Launch Pad 39A and one (about 0.2 miles) that extends to Launch Pad 39B; just northeast of Launch Pad 39A is the East Yard, a two-track yard. The east branch of the NASA KSC railroad ends at the boundary between KSC and CCAFS; this location forms one of the two south boundaries of the railroad track.

The west branch of the railroad, with a total length of approximately 11 miles, extends from Wilson's Corner to the KSC Industrial Area, the second south boundary. Just over one-half mile from Wilson's Corner, there is a roughly 0.5-mile spur west toward the SLF, which is referred to as Suspect Siding. Approximately 4.5 miles south of Wilson's Corner, at the north end of the VAB Area, there is a roughly 1.7-mile spur that extends east toward the RPSF. Just prior to reaching the facility, the spur splits into two, with one branch going into the facility, and the second continuing approximately 1.07 miles to the Compression/Converter Facility (CCF) (**Photo 3-2**). This location forms one of the east boundaries of the track. Approximately 1 mile south of the RPSF/CCF spur (and about 3 miles north of the Industrial Area) is the roughly 0.83 mile-long, four-track LMF.



Photo 3-2. Split in track showing the spur extending towards the RPSF from the branch to the CCF, facing west.

Source: Archaeological Consultants, Inc., January 2012.

The NASA KSC Railroad Track has been used to carry a variety of materials and spacecraft components. Both the east and west branches have been used to transport generic GSE and construction materials to various locations on the center. The east branch was used for fuel and oxidizer shipments to CCAFS, as well as Air Force Titan rocket and Navy Trident missile deliveries. The west branch was used throughout the SSP to carry fueled SRM segments from Utah to KSC and spent SRM segments from KSC to Utah. It also supported the delivery of SRM segments for the Ares I-X flight test (Heiney 2011; *Spaceport News* 2001). As a whole, in view of its largely general support function vis a vis the U.S. Manned Space Programs, the NASA KSC Railroad Track is not considered individually eligible for listing in the NRHP. However, a roughly 19-mile portion of the track, used for the delivery of SRM segments, is considered contributing to the NRHP-eligible NASA KSC Railroad System Historic District (see Section 3.6).

3.3 Jay Jay Railroad Draw Bridge (8BR2906)

The Jay Jay Railroad Draw Bridge (Jay Jay Bridge, H2-1198) is a steel single-leaf bascule bridge constructed ca. 1963, which carries the NASA KSC railroad over the Indian River to KSC on the east side. The 2,058 ft-long bridge is comprised of 75 spans. The main, single leaf, through-girder bascule steel span with floorbeams and stringers measures 157 ft by 24 ft, and crosses a 90 ft channel (**Photo 3-3**). The other 74 spans are fixed open deck steel girders that measure 24 ft-8 in by 14 ft (Maurice H. Connell and Associates & Nashville Bridge Company 1963). The deck features a single, standard-gauge (4 ft-8.5 in) track.



Photo 3-3. Aerial view of the Jay Jay Draw Bridge (8BR2906), August 16, 2010.
Source: Frank Washburn, KSC.

The concrete substructure is comprised of 72 bents, two end bents, and two piers. There are 62 single bents with three piles and 10 double bents with six piles. Each 20 in by 20 in concrete pile is either rounded or squared and reaches about 3 ft-6 in above the waterline (Transystems 2011). Concrete caps that measure 3 ft-6 in high are placed on top of all the piles (**Photo 3-4**). The two reinforced

concrete end bent walls are protected by a concrete seawall reinforced by steel rods, packed earth, and riprap slope protection (Maurice H. Connell and Associates & Nashville Bridge Company 1963).



Photo 3-4. Jay Jay Draw Bridge substructure of approach spans, facing southeast.
Source: Archaeological Consultants, Inc., January 2012.

Pier 1 is an irregularly-shaped, partially submerged reinforced concrete pit along the west side of the channel that houses the bascule's machinery and its trunnion and counterweight. The pier measures 53 ft by 42 ft-3 in, stands 34 ft-2 in tall, and rests on a 14 ft-thick concrete slab. Wooden catwalks branch off from the bridge and lead to concrete platforms on top of the north and south sides of the pier. Access to the Pier 1 pit is gained through a hatch with a steel door on the south platform. Two ladders lead to the pier's floor, which is kept dry by a sump pump. Pier 2 is an irregularly-shaped reinforced concrete wall along the east side of the channel that measures 33 ft long, 8 ft-8 in at its thickest, and 24 ft-7 in deep (Maurice H. Connell and Associates & Nashville Bridge Company 1963). The bascule span rests on Pier 2 when lowered.

An approximately 186 ft-long stretch of concrete piles with wooden fenders line both sides of the channel to protect the Jay Jay Bridge. Five timber wale supports are attached to the piles, each of which has two or three piers. Catwalks with wooden decks and metal rails have been built on top of the fender piles. Clusters consisting of seven wooden piles have been placed at the northwest, northeast, southeast, and southwest corners of the channel to protect the fenders (Maurice H. Connell and Associates & Nashville Bridge Company 1963).

The steel bascule span is a Hopkins Frame-mounted, single leaf, through-girder with floorbeams. The span is curved at the trunnions and measures 157 ft long and 24 ft wide with approximately 10 ft-tall sidewalls. Two Hopkins Frame trunnions raise and lower the bridge. In addition to the trunnions, the bascule span includes a counterweight and six segments with beams and X-braces. When the bridge is lowered, two span locks securely connect it to Pier 2 (Maurice H. Connell and Associates & Nashville Bridge Company 1963).

The Control House (**Photo 3-5**) is not manned, so the Jay Jay Bridge is usually in a fully open position with green lights flashing to indicate that vessels are free to pass. The Code of Federal Regulations (CFR) dated July 1, 2005, describes the bridge's operation:

When a train approaches the bridge, it stops and the operator initiates a command to lower the bridge. The lights go to flashing red and the draw lowers and locks, providing scanning equipment reveals nothing under the draw. The draw remains down until a manual raise command is initiated, or will raise automatically 5 minutes after the intermediate track circuit is no longer occupied by a rail car. After the train has cleared, the draw opens and the lights return to flashing green (33 CFR Ch. 1, Section 117.261(j)(3)).



Photo 3-5. Jay Jay Bridge Control House, facing southwest.
Source: Archaeological Consultants, Inc., January 2012.

All 74 fixed steel bridge spans have a superstructure that consists of two girders, three beams, and four cross braces. The girders rest on steel plates that sit on top of the concrete bent caps and separate the substructure and superstructure. The girders are 24 ft-8 in long and 2 ft-9.25 in tall and run parallel to each other, and the beams are 5 ft-8 in long and are perpendicular to the girders; the cross braces are 7 ft long (Maurice H. Connell and Associates & Nashville Bridge Company 1963).

Steel plates also are used to separate the spans and wooden railroad ties, and all three are bolted together. The 8 in by 8 in ties have two lengths: 9 ft and 14 ft. Three 9 ft ties are laid for every 14 ft tie, and the 14 ft ties extend on the north side of the tracks to support the wooden walkway. The walkway consists of four rows of planks placed end to end; it is supported by a braced wooden railing. Standard gauge steel railroad tracks are secured to the ties; in addition, wood ties placed end-to-end run parallel to the railroad tracks on either side (**Photo 3-6**). At the bascule span, all the ties are 9 ft long and a double plank timber walkway runs through the middle of the tracks (Maurice H. Connell and Associates & Nashville Bridge Company 1963).



Photo 3-6. Bridge deck showing track and wooden walkway, facing southwest.
Source: Archaeological Consultants, Inc., January 2012.

Access to the Control House is gained from the same concrete platform that encompasses the hatch that leads down to the Pier 1 pit. The Control House itself, the exterior shell of which was replaced in 2008, rests on a concrete platform supported by four concrete piles. The metal building has a gable roof, and entry is through a metal door on the north elevation. Single 6/6 metal sash windows are located on the west and south elevations. The room is divided into two sections: the larger main room contains the equipment that operates the bridge, and a smaller room to the west is used for storage.

While noteworthy for its significant historical associations, the Jay Jay Bridge was built to a standard plan for railroad bridges and is not distinguished by its engineering or design. Therefore, it is not considered individually eligible for the NRHP. However, the Jay Jay Bridge is considered a contributing resource to the NASA KSC Railroad System Historic District (see Section 3.6). The bridge is the only railroad span to link the FEC mainline to KSC facilities and played an integral role in support of the SSP, most notably in the transportation of new and used SRM segments. The bridge has undergone repairs necessitated by its corrosive environment, yet it has retained its original bascule span and mechanisms and integrity of location, design, setting, materials, workmanship, feeling, and association.

3.4 Locomotives (8BR2923, 8BR3043, 8BR3044)

Locomotives 1, 2, and 3, (8BR2923, 8BR3043, and 8BR3044, respectively) are model EMD SW1500 switching locomotives built by the General Motors' EMD. The locomotives are 44 ft-8 in long and stand 11 ft-9 in tall at the engine hood and 15 ft at the top of the cab. They weigh 248,000 tons and sit on two, four-wheel trucks with a 40 in wheel diameter. A walkway surrounds the engine and is accessible either from the cab or from the steps at the front. The 1,500 horsepower, V-12 diesel engine is capable of reaching speeds up to 65 mph (Bachand n.d.). Locomotive 1 was built in February 1968 for the TP&W, and Locomotives 2 and 3 followed in 1970. They had the numbers TP&W 303, 305, and 306, respectively (KSC-TO, Folder No. Locomotive 1). NASA bought the three

locomotives on July 24, 1984, for \$108,000 each to replace the Alco S2 locomotive switcher cars that had been purchased in 1976 from the Army (KSC-TO, Folder No. Locomotive 1; NASA 2007). Locomotives 1 and 2 were repainted black, red, and gray with white stripes (**Photo 3-7**). Locomotive 3 also was painted in this color scheme, but is now black, blue, and white with red stripes as a result of a 15-month corrosion repair project completed in 2008.

Locomotives 1, 2, and 3 moved railcars to and from the Jay Jay Yard to facilities throughout KSC and to the Center's exchange with the CCAFS. Most notably, the locomotives transported SRM case segments (*Spaceport News* 2011). They also conveyed GSE for the SSP, the rocket propellant nitrogen tetroxide, Air Force Titan rockets, Navy Trident missiles, and booster segments for the Ares I-X test flights (NASA 2007).



Photo 3-7. Locomotive 1, EMD SW1500, (8BR2923).
Source: Archaeological Consultants, Inc., January 2012.

Locomotives 1, 2, and 3 are considered eligible for listing in the NRHP as a contributing resource to the NASA KSC Railroad System Historic District (see Section 3.6). The three locomotives were crucial to the NASA KSC railroad's support of the SSP; everything that entered KSC from 1984 to 2010 via the railroad was transported by one of these three locomotives. Most prominently, the locomotives were used to transport the SRM case segments between the Jay Jay Yard and various facilities within KSC. Furthermore, the locomotives moved GSE and supplies important to the SSP and its associated activities at KSC. The locomotives have retained their historical integrity, and while Locomotive 3 has been repainted in a new design scheme, it does not radically depart from the paintwork on Locomotives 1 and 2.

3.5 Rolling Stock (8BR2907 through -2922 and 8BR2924 through -2930)

At the time of field survey in January 2012, 75 railcars owned by NASA were identified and recorded (8BR2907 through -2922 and 8BR2924 through -2930).¹ This rolling stock was divided into 23 groups on the basis of type, length, or capacity. Multiple railcars within the same group share a single FMSF number (Tables 3-1 and 3-2).

Table 3-1. Inventory of Surveyed Rolling Stock, by Type.

GROUP	DESCRIPTION	NO. ASSETS	APPROXIMATE BUILD DATES	FMSF NO.
1	Flat car – Spacer – 70-ton	2	1952	8BR2907
2	Flat car – Aft skirt – 70-ton	2	1985	8BR2908, 8BR3042
3	Flat car – 90-ft; 55-ton	2	1961	8BR2909
4	Flat car –60-ft; 100-ton	3	1968	8BR2914
5	Flat car –Pig -70-ton	2	1968	8BR2915
6	Flat car – 100-ton	14	1952	8BR2916
7	Flat car – Spacer – 90-ft; 70-ton	2	1965	8BR2921
8	Flat car – 90-ft	2	1961	8BR2924
9	Flat car – 90-ft	2	1967	8BR2925
10	Flat car – 90-ft	2	1969	8BR2926
11	Flat car –65-ft; 90-ton	1	1967	8BR2928
12	Helium car	13	1961	8BR2919
13	Hopper car – 100-ton	10	1971-1979	8BR2912
14	Hopper car – 100-ton	1	1968	8BR2927
15	Tank car – 70-ton	1	1982	8BR2910
16	Tank car – 100-ton	4	1962, 1975	8BR2911
17	Tank car – Hydrogen - 70-ton	2	unknown	8BR2920
18	Tank car – 70-ton	1	unknown	8BR2930
19	Gondola car – 60-ft	2	1966	8BR2917
20	Gondola car – 74-ft; 100-ton	1	1976	8BR2922
21	Gondola car – 60-ft	3	1966, 1995	8BR2929
22	Cover car	2	1960	8BR2913
23	Boxcar – 70-ton	1	1970	8BR2918
	Total	75		

¹ Since the field survey, many of the railcars have been sold or excessed. See Appendix D for a list of the 39 NASA-owned railcars as of June 13, 2012.

Table 3-2. NASA KSC Railcars Inventory as of January 2012.

SITE NO.	NLAX NO.	YEAR BUILT	PRIOR NO.	NASA ACQUIRED	DESCRIPTION	NRHP ELIGIBILITY
8BR2907	40 41	n.d. 1952	DODX 11870 DODX 12165	1982 1982	70-Ton Flat Spacer	Not eligible
8BR2908	170	1985	Not applicable	1985	70-Ton Aft Skirt	Eligible as a contributing resource to new historic district
8BR3042	171	1985	Not applicable	1985	70-Ton Aft Skirt	Eligible as a contributing resource to new historic district
8BR2909	120 121	1961 1961	WP 85041 WP 85021	1982 1982	55-Ton, 90-Foot Flat	Not eligible
8BR2910	190	1982	Not applicable	1982	70-Ton Tank	Not eligible
8BR2911	191 197 198 890	n.d. Ca. 1962 n.d. 1975	Unknown DODX 4434 DODX 14430 Unknown DODX	Ca. 1990 Ca. 1980 Ca. 1990 Ca. 1990	100-Ton Tank	Not eligible
8BR2912	107 108 109 110 111 112 117 118 119 180	1973 1974 1975 1977 1979 1979 1973 1973 1971 1974	P&S 372 P&S 476 P&S 524 ROCK 609999 RI 701042 RI 701198 P&S 319 Unknown Unknown Unknown	1991 1991 1991 1984 1984 1984 1991 1991 1991 Ca. 1991	100-Ton Triple-Hopper	Not eligible
8BR2913	153 154	1960 1960	NIFX 9206 NIFX 9215	1981 1982	Cover Car	Not eligible
8BR2914	125 126 127	1968 1968 1968	JHTX 1003 JHTX 1004 JHTX 1012	1987 1987 1987	100-Ton, 60-Foot Flat	Not eligible
8BR2915	141 142	1968 n.d.	TTX 602325 RF&P 501	Ca. 1985 1989	70-Ton, 89-Foot Pig Flat	Not eligible
8BR2916	42 43 44 45 46 47 48 49 50 51 None None None None	Ca. 1952 Ca. 1952	Unknown DODX Unknown DODX AF 35815 AF 35819 AF 35851 AF 35856	Ca. 1998 Ca. 1998	100-Ton Flat	Not eligible

SITE NO.	NLAX NO.	YEAR BUILT	PRIOR NO.	NASA ACQUIRED	DESCRIPTION	NRHP ELIGIBILITY
8BR2917	175 176	1966 1966	RI 3876 RI 3895	1984 1984	60-Foot Gondola	Not eligible
8BR2918	4005	1970	RI 534005	1985	70-Ton Boxcar	Not eligible
8BR2919	None None None None None None None None None None None None None None None None	Ca. 1961 Ca. 1961	MHAX1171 (AF 20) MHAX 1211B (AF 16) MHAX 1166 (AF 4) MHAX 1178B (AF 17) MHAX 1177 (AF 12) MHAX 1179 (AF 14) MHAX 1165B (AF 1) MHAX 1174 (AF 3) MHAX 1212B (AF 8) MHAX1215A MHAX 1192 MHAX 1213B MHAX 1204	1998 1998 1998 1998 1998 1998 1998 1998 1998 1998 1998 1998 1998 1998 1998 1998	Helium Car	Not eligible
8BR2920	201 202	n.d. n.d.	Unknown Unknown	Ca. 1965 Ca. 1965	70-Ton Hydrogen Tank	Not eligible
8BR2921	130 131	1965 1965	OTDX 2010 OTDX 2013	Unknown Unknown	70-Ton, 90-Foot Flat Spacer	Not eligible
8BR2922	100	1976	PLCX 81	1987	100-Ton, 74-Foot Gondola	Not eligible
8BR2924	122 123	1961 1961	WP 85014 WP 85042	1982 1982	90-Foot Flat	Not eligible
8BR2925	160 161	1967 1967	ATSF 299970 ATSF 299977	1983 1983	90-Foot Flat	Not eligible
8BR2926	162 163	1969/ 1973 n.d.	SP 900317/ RTTX 159676 Unknown	1983 1983	90-Foot Flat	Not eligible
8BR2927	914	1968	BN 523098	Unknown	100-Ton Triple-Hopper	Not eligible
8BR2928	124	1967	RI 92542	1984	90-Ton, 65-Foot Flat	Not eligible
8BR2929	177 178 179	1966 1966 1995	RI 3892 RI 3896 NLAX 006	1984 1985 1995	60-Foot Gondola	Not eligible
8BR2930	194	n.d.	Unknown	Ca. 2000	70-Ton Water Tank	Not eligible

8BR2907: NLAX 40 and NLAX 41 (**Photo 3-8**) are identical **70-ton flat spacer railroad cars**. Each measures approximately 44.5 ft in length and rests on four axles. The cars are of steel construction and are painted blue with white lettering. Two sets of handrails are located at each end, one for each of the cars' access ladders. NLAX 40 and NLAX 41 originated as Department of Transportation (DOT) Class 103W tank cars, built for the DoD and designated DODX 11870 and DODX 12165, respectively. Records at the KSC-TO indicate DODX 12165 was built in 1952 for \$6,300. Both cars, originally used for the transfer and storage of isopropyl alcohol, were leased to NASA by the U.S. Army for about 15 years prior to being formally transferred, for \$9,000 each, on September 7, 1982.

Upon transfer, DODX 11870 became NLAX 185, and DODX 12165 became NLAX 186 (KSC-TO, Folder Nos. 6670-5-040 and 6670-5-041).

In 1982, NLAX 186 was repaired and upgraded to extend its service life. In September 1995, both cars were converted into 70-ton flat spacer cars, at which point NLAX 185 became NLAX 40, and NLAX 186 became NLAX 41 (KSC-TO, Folder Nos. 6670-5-040 and 6670-5-041). These railcars did not significantly contribute to any U.S. Manned Space Program. Therefore, they are not considered NRHP-eligible, either individually or as a contributing resource to the NASA KSC Railroad System Historic District.



Photo 3-8. 70-Ton Flat Spacer Railroad Car, NLAX 41, (8BR2907).
Source: Archaeological Consultants, Inc., January 2012.

8BR2908/8BR3042: NLAX 170 (8BR2908; **Photo 3-9**) and NLAX 171 (8BR3042) are **70-ton railroad flatcars** that measure 66 ft in length. They are made of steel, rest on four axles, and contain two steel vertical beams, approximately 12 ft in height with supports at both ends. The two cars feature a unique, double-well arrangement designed specifically to carry SRB components, including one frustum, one forward skirt, and two aft skirts. Special aft skirt attachment hardware was incorporated into the cars. NLAX 170 and NLAX 171 were built for NASA by the Davidson-Kennedy Company of Atlanta, Georgia, which was awarded the contract to build the cars on July 22, 1983; the company subcontracted the car body design to Nelson Associates of Springfield, Virginia. Each car cost \$84,571 and arrived at KSC on April 19, 1985. The only two of their kind in the world, the NASA KSC railroad crew referred to them as “Carnival Cars” because of their unique appearance (KSC-TO, Folder Nos. 6670-5-170 and 6670-5-171).

NLAX 170 and NLAX 171 are considered contributing resources to the NRHP-eligible NASA KSC Railroad System Historic District (see Section 3.6). The cars are significant because they are the only railcars within the NASA KSC Railroad System commissioned by NASA and designed for a specified use. The railcars are also significant because of the role they played in support of the SSP in the transport of SRB components. They each could carry four irregularly-shaped SRB components that would have otherwise required three trucks and a railcar to transport. Thus, the cars offered a great deal of time and financial savings to NASA in their more than two decades of service. NLAX

170 and NLAX 171 have retained a high level of integrity with regard to design, materials, workmanship, feeling, and association.



Photo 3-9. 70-Ton Aft Skirt Flatcar, NLAX 170, (8BR2908).
Source: Archaeological Consultants, Inc., January 2012.

8BR2909: NLAX 120 (**Photo 3-10**) and NLAX 121 are **55-ton, railroad flatcars**. The steel flatcars have four axles and a cushioned underframe, and measure 90 ft in length, 10 ft-1 in wide, and 3 ft-6 in tall. The cars' decks are cut out in the middle, and isosceles trapezoid bulkheads are attached at both ends. Metal tanks are located in the middle of the railcars, just below the underdeck (KSC-TO, Folder No. Blue Ox Special Hopper Pullman Standard 1976). NLAX 120 and NLAX 121 were both built by Pullman in 1961 and owned by Western Pacific. NLAX 120 was originally designated WP 85041, and NLAX 121 was WP 85021 (KSC-TO 1987). NASA purchased the two cars for \$5,300 each from Ortner Freight Car Company in September 1982, and Ortner subsequently won the contract to modify the cars. They were used by NASA in support of the SSP to transport orbiter tailcone boxes (KSC-TO, Folder No. Blue Ox Special Hopper Pullman Standard 1976). These railcars were not a significant contributor to any U.S. Manned Space Program; therefore, they are not considered individually eligible for the NRHP, nor are they considered a contributing resource to the NASA KSC Railroad System Historic District.



Photo 3-10. 55-Ton, 90-Ft Flatcar, NLAX 120, (8BR2909).
Source: Archaeological Consultants, Inc., January 2012.



Photo 3-11. 70-Ton Tank Car, NLAX 190, (8BR2910).
Source: Archaeological Consultants, Inc., January 2012.

8BR2910: NLAX 190 (Photo 3-11) is a **70-ton, 44-ft-long tank car** that holds approximately 15,000 gallons. A model DOT III A100W1 tank car, it was built in 1982 by General American Transportation and purchased new by NASA for \$70,000. It was the first new railcar bought for the NASA KSC railroad, and used to transport Freon 113 to KSC from vendors in Louisiana (KSC-TO 1980; KSC Archives Folder No. 6630-3-1). The Florida Fish and Wildlife Conservation Commission used NLAX 190 to hold water used to fight fires (Hoffman 2012b). It was not a significant

contributor to any U.S. Manned Space Program, and thus, is not considered eligible for the NRHP, either individually or as a contributing resource to the NASA KSC Railroad System Historic District.

8BR2911: NLAX 191, NLAX 197, NLAX 198, and NLAX 890 (**Photo 3-12**) are **100-ton tank cars**. Each features a manway and safety vent on top of the tank; NASA used the cars to store water. Stenciling on the side of NLAX 191, mostly worn away, indicates it has a load limit of 250,500 pounds. NLAX 197 was numbered DODX 4434 before it came into NASA's possession. A Found on Station Equipment Investigation form from January 28, 2003, indicates that it was transferred to NASA ca. 1980 and was a model T104 built in 1953 by American Car and Foundry; it originally cost \$6,427 (KSC-TO 2003). However, stencils on the car indicate it was likely rebuilt in December 1962. NLAX 198 originally was designated DODX 14430. Records indicate NLAX 890 is a model T106 railcar built by General American Transportation Corp in 1975. It was purchased by the U.S. Government at an unknown date for \$75,000 and was later transferred to NASA ca. 1990 (KSC-TO 1999). Stenciling on the railcar indicates it was built in November 1991, yet it also shows that the railcar was tested in 1975. Therefore, it was likely that the car's tank was either replaced or refurbished in 1991. These four railcars have no significant historical associations with the U.S. Manned Space Programs. Therefore, they are not considered individually eligible for the NRHP, nor are they considered a contributing resource to the NASA KSC Railroad System Historic District.



Photo 3-12. 100-Ton Tank Car, NLAX 890, (8BR2911).
Source: Archaeological Consultants, Inc., January 2012.

8BR2912: NLAX 107, NLAX 108, NLAX 109, NLAX 110, NLAX 111, NLAX 112, NLAX 117, NLAX 118, NLAX 119, and NLAX 180 (**Photo 3-13**) are **100-ton, triple-hopper railroad cars**. These steel railcars each measure 45 ft long, 9 ft-10 in wide, and have 8 ft-9 in-tall side sheets. They sit on four axles and feature three hoppers with doors. The railcars were used to haul track ballast and other aggregates used in the maintenance of KSC. All 10 were used in support of construction of the Crawlerway (KSC-TO, Folder No. 6670-5-107). NLAX 107, NLAX 108, NLAX 109, and NLAX 117, built between 1973 and 1975, were wreck-damaged railcars bought from the Pittsburg and Shawmut Railroad Company in Kittanning, Pennsylvania, in May 1991 for \$16,238.74 (NASA-TO, Folder Nos. 6670-5-107 and 6670-5-109). NLAX 110, NLAX 111, and NLAX 112, constructed between 1977 and 1979, were purchased from the Chicago Pacific Corporation in 1984 for \$3,000 each and were under repair when the Chicago Rock Island & Pacific shut down. They were sold to

NASA even though they were under lease from another railroad (KSC-TO, Folder No. 6670-5-109). NLAX 118 was built by Bethlehem Steel in August 1973 and was damaged when it was purchased by NASA in February 1991 (KSC-TO 1998c). NLAX 119 was built by Bethlehem Steel in May 1971 and purchased by NASA 20 years later from the Pittsburg and Shawmut Railroad Company (KSC-TO 1998d). NLAX 180 was built in December 1974 and was likely purchased and refurbished by NASA shortly before the Crawlerway was rebuilt in the early 1990s (KSC-TO 1987). These railcars did not contribute significantly to any U.S. Manned Space Program, and therefore, are not considered individually eligible for the NRHP. Additionally, they are not considered a contributing resource to the NASA KSC Railroad System Historic District.



Photo 3-13. 100-Ton, Triple-Hopper Railroad Car, NLAX 180, (8BR2912).
Source: Archaeological Consultants, Inc., January 2012.

8BR2913: NLAX 153 (**Photo 3-14**) and 154 are SRM cover cars. They measure 87 ft-4 in long, and are flanked by three pairs of arms at the front, back, and middle that extend approximately 3 ft from the car deck. The deck for NLAX 153 is clear except for the center cross beam, while the deck for NLAX 154 has built-in fasteners for the SRM covers. There are four axles per car, and the cars are distinguished by both the 7.5-in lips on the top of the sidesills and railings at both ends. NLAX 153 and 154 originated as piggyback flat cars built by Pullman-Standard in 1960 for General Electric Rail Services; NLAX 153 was previously NIFX 9206, and NLAX 154 was NIFX 9215. They were rebuilt in 1974 when bi-level auto racks were added to each; however, the two railcars were never used to haul vehicles. NASA purchased NLAX 153 on December 11, 1981, for \$7,394. NASA initially intended to use it as a spacer car, but found it ideal to carry/store two SRM segment covers when they were not being used. Modifications were completed by the NASA KSC railroad staff and cost from \$2,000 to \$3,000. Shortly thereafter, NLAX 154 was also purchased for the same price and subsequently modified (KSC-TO, Folder No. 6670-5-154). Because of their primarily mundane task of carrying and storing GSE, these two cover cars were not a significant contributor to any U.S. Manned Space Program and are not considered NRHP-eligible, either individually or as a contributing resource to the NASA KSC Railroad System Historic District.



Photo 3-14. Cover Car, NLAX 153, (8BR2913).
Source: Archaeological Consultants, Inc., January 2012.



Photo 3-15. 100-Ton, 60-Ft Flatcar, NLAX 127, (8BR2914).
Source: Archaeological Consultants, Inc., January 2012.

8BR2914: NLAX 125, NLAX 126, and NLAX 127 (**Photo 3-15**) are **100-ton, 60-ft flatcars** made of steel with cushioned underframes. NLAX 125 has built-in racks to hold equipment and appears to have been modified. NLAX 126 and NLAX 127 have four pairs of supports evenly spaced throughout the deck. All three cars, built in 1968 by Thrall Car Manufacturing Company, originally were numbered JHTX 1003, 1004, and 1012 (KSC-TO 1987). They were purchased for a total of \$16,500 in 1987 from Railmark Inc. in Madeira Beach, Florida (KSC-TO, Folder No. 6670-5-125). These three railcars played no historically significant role in any U.S. Manned Space Program. Therefore, they are not considered individually eligible for the NRHP, nor are they considered a contributing resource to the NASA KSC Railroad System Historic District.

8BR2915: NLAX 141 and NLAX 142 (**Photo 3-16**) are **70-ton, 89-ft-long pig flatcars**. Each features low sidesills and a bridge plate at one end. The cars were designed to transport trailers. Accordingly, NLAX 141 has a ridge on its deck toward the center plate and another in the middle, while NLAX 142 has ridges at its ends and middle. NLAX 141 likely was built by Bethlehem in 1968 and was owned by the Chicago-based Trailer Train Company as TTX 602325 (KSC-TO 1987). NLAX 142 was owned by the Richmond, Fredericksburg, and Potomac Railroad and had the number RF&P 501. It was purchased by NASA in January 1989 for \$6,100 and used during the SSP to transport GSE to a contingency landing site should the need arise (KSC-TO, Folder No. 6670-5-142). These railcars were not a significant contributor to any U.S. Manned Space Program, and therefore, are not considered individually eligible for the NRHP or as a contributing resource to the NASA KSC Railroad System Historic District.



Photo 3-16. 70-Ton, 89-Ft-Long Pig Flatcar, NLAX 142, (8BR2915).
Source: Archaeological Consultants, Inc., January 2012.

8BR2916: Fourteen **100-ton flatcars** are included in the NASA KSC Railroad System: NLAX 42, NLAX 43 (**Photo 3-17**), NLAX 44, NLAX 45, NLAX 46, NLAX 47, NLAX 48, NLAX 49, NLAX 50, NLAX 51, AF 35815, AF 35819, AF 35851, and AF 35856. They measure 56 ft-6 in long and rest on six axles and two trucks. Decks vary among the 14 railcars. Some have unobstructed steel decks, while fittings have been added to others to hold specific equipment. A few decks are wood, so nails could be used to secure items to the deck. The railcars were built by the Pressed Steel Car Company in the early- to mid- 1950s for the Air Force for use in support of the Titan Missile Program, which lasted from the mid-1960s to the late 1980s (Hoffman 2012b). The cars originally weighed 80 tons and had a weight capacity of 90 tons, but two axles were added to each car to increase the limit (Stephens 2012a). NLAX 44, NLAX 48, and NLAX 49 have been designated as spacer cars. Records show NLAX 41 and NLAX 42 were purchased for \$41,856 at an unknown date (KSC-TO 1987). NASA acquired the cars ca. 1998 after the Titan Program ended (Hoffman 2012b). These 100-ton flatcars were not a significant contributor to any U.S. Manned Space Program. Therefore, they are not considered eligible for the NRHP, either individually or as a contributing resource to the NASA KSC Railroad System Historic District.



Photo 3-17. 100-Ton Flatcar, NLAX 43, (8BR2916).
Source: Archaeological Consultants, Inc., January 2012.

8BR2917: NLAX 175 (**Photo 3-18**) and NLAX 176 are **60-ft long gondola railroad cars** that were used to transport three SRM end ring racks in support of the SSP. The steel cars rest on four axles with a cushioned underframe and have a weight capacity of 93,000 pounds. The cars steel floors and side sheets measure 3 ft-8 in tall (KSC-TO, Folder No. 6670-5-175). NLAX 175 and NLAX 176 were built by Ortnier in 1966 and were the property of the Rock Island Railroad with the numbers RI 3876 and RI 3895 (KSC-TO 1987). NASA bought them for \$3,000 each in late 1984 from the Chicago Pacific Corp., formerly the Rock Island Railroad (KSC-TO, Folder No. 6670-5-175). These gondola railcars were not a significant contributor to any U.S. Manned Space Program. Therefore, they are not considered eligible for the NRHP, either individually or as a contributing resource to the NASA KSC Railroad System Historic District.



Photo 3-18. 60-Ft Gondola Car, NLAX 175, (8BR2917).
Source: Archaeological Consultants, Inc., January 2012.



Photo 3-19. 70-Ton Boxcar, NLAX 4005, (8BR2918).
Source: Archaeological Consultants, Inc., January 2012.

8BR2918: NLAX 4005 (**Photo 3-19**) is the only **boxcar** within the NASA KSC Railroad System. It is 55 ft-5 in long, 10 ft wide, and weighs 70 tons (KSC-TO, Folder No. NLAX 4005 Boxcar). The car was built in 1970 by the American Car and Foundry Company and had the number RI 534005 (KSC-TO 1987). NASA purchased it on March 6, 1985, from the Chicago Pacific Corp., formerly the Rock Island Railroad (KSC-TO, Folder No. NLAX 4005 Boxcar). NLAX 4005 was used to transport a variety of materials, and as a storage facility for large projects, such as locomotive engine rebuilds (Stephens 2012b). This railcar was not a significant contributor to any U.S. Manned Space Program; therefore, it is not considered individually eligible for the NRHP, nor is it considered a contributing resource to the NASA KSC Railroad System Historic District.

8BR2919: MHAX1171 (AF 20), MHAX 1211B (AF 16), MHAX 1166 (AF 4), MHAX 1178B (AF 17), MHAX 1177 (AF 12), MHAX 1179 (AF 14), MHAX 1165B (AF 1), MHAX 1174 (AF 3) (**Photo 3-20**), MHAX 1212B (AF 8), MHAX 1215A, MHAX 1192, MHAX 1213B, and MHAX 1204 are **helium railroad cars**. The identical steel railcars measure 46 ft-1 in long, 10 ft-4 in wide, and 12 ft-7 in tall. Each weighs 235,000 pounds and has a load limit of 28,000 pounds, which makes them among the heaviest freight cars ever built (KSC-TO, Folder No. MHAX Cars; Hoffman 2012b). Each car has four axles and two separate braking systems, one for each truck. Long bottle tanks with .75 in thick nominal walls are held by pressurized banks within the cars, and each car can hold six rows of tanks stacked five high for a total of 30 tanks per car. Pentagon-shaped steel caps are located at the end of each helium car, and one of the ends has double steel doors that house the mechanical equipment used to regulate the tanks' pressure. The 13 cars were all built circa 1961 for the U.S. Bureau of Land Management and cost from \$91,422.02 to \$105,825.81 each. They were used to transport helium from mines near Amarillo, Texas, to locations throughout the U.S. (KSC-TO, Folder No. MHAX Cars). The government privatized the mining and transportation of helium in the 1980s, and some of its helium railcars were transferred to KSC for in-plant use; they were used to store helium up until the last shuttle launch in 2011 (Houston Railroad Museum n.d.; Stephens 2012b). The Air Force used helium to purge the Titan rocket lines. The helium arrived in the cars as a liquid, and KSC's CCF converted it to a gas before it was moved to the CCAFS interchange (NASA 2007). These cars were not a significant contributor to any U.S. Manned Space Program, and therefore, are

not considered eligible for the NRHP, either individually or as a contributing resource to the NASA KSC Railroad System Historic District.



Photo 3-20. Helium Car, MHAX 1174 (AF 3), (8BR2919).
Source: Archaeological Consultants, Inc., January 2012.

8BR2920: NLAX 201 (**Photo 3-21**) and NLAX 202 are **70-ton hydrogen tank cars** that measure 83-ft long. Each tank holds approximately 34,400 gallons. Refrigeration equipment is housed within a square compartment at one end of each car's tank, and a manway near the compartment provides access to the tank's interior. The bottom third of each car is painted yellow, and the remainder is white. NASA purchased NLAX 201 and NLAX 202 new from Linde ca. 1965, according to an August 10, 1987, NASA KSC railroad inventory (KSC-TO 1987). From 1965 to 1981, the railcars were used at Glenn Research Center in Ohio (Hoffman 2012b). NLAX 202 was refurbished and painted for approximately \$221,000, and NLAX 201 probably received similar work at the same time (KSC-TO, Folder No. 6670-5-202). The cars were used to transport refrigerated, liquefied hydrogen to KSC, where the hydrogen was used in support of the SSP. The cars were only used on a few occasions, and maintenance of NLAX 201 and 202 ceased on July 5, 1994 (KSC-TO, Folder No. LH2 Railcar Maintenance and Storage). The two hydrogen tank cars did not have a significant role in any U.S. Manned Space Program, and they are not considered individually eligible for the NRHP or as a contributing resource to the NASA KSC Railroad System Historic District.



Photo 3-21. 70-Ton Hydrogen Tank Car, NLAX 201, (8BR2920).
Source: Archaeological Consultants, Inc., January 2012.

8BR2921: NLAX 130 and NLAX 131 (**Photo 3-22**) are **70-ton, 90-ft flat spacer cars**. They lack decks and feature platforms at either end of the car, which are surrounded by handrails and accessible by a short ladder. The cars were built by General American Transportation Corporation in 1965 and at one time were owned by the Oil-Dri Corporation with the numbers OTDX 2010 and OTDX 2013. It is unknown when NLAX 130 and NLAX 131 were purchased for the NASA KSC railroad. Their earliest reference is an August 10, 1987, inventory, which indicates they were skeleton cars used to hold 20-ft-long and 40-ft-long intermodal containers (KSC-TO 1987). In 1993, the two flatcars were reconditioned and designated as spacer cars (KSC-TO 1993). These flat spacer cars were not a significant contributor to any U.S. Manned Space Program. Therefore, they are not considered eligible for the NRHP, either individually or as a contributing resource to the NASA KSC Railroad System Historic District.



Photo 3-22. 70-Ton, 90-Ft Flat Spacer Car, NLAX 131, (8BR2921).
Source: Archaeological Consultants, Inc., January 2012.



Photo 3-23. 100-Ton Gondola Car, NLAX 100, (8BR2922).
Source: Archaeological Consultants, Inc., January 2012.

8BR2922: NLAX 100 (**Photo 3-23**) is a 100-ton steel **gondola car** known as the “Blue Ox.” It measures approximately 74 ft long, 9 ft-9 in wide, and 15 ft tall. This car was built as a prototype by Pullman in June 1976, and designated PLCX 81. Designed to carry long logs, pulp wood logs, and wood chips, Pullman said the multipurpose car, featured in the October 25, 1976, issue of *Railway Age* magazine, could save Southern pulpwood mills up to \$20 million a year and revolutionize the transportation of bulk commodities (Welty 1976). In the mid-1980s, NASA sought to transport one of the two, 18 ft by 45 ft aft access platforms from the orbiter assembly facility in Palmdale, California, to KSC. It would have cost approximately \$500,000 to transport the platform aboard an Air Force C-5 airplane. As a cost-saving measure, in May 1987, NASA bought the railcar, which was about to be scrapped, from Star Railroad Equipment of Lansing, Illinois, for \$15,000 (Hoffman 2012b; KSC-TO, Folder No. 6670-5-100). At that time, the railcar was numbered NLAX 81; three years later, it was renumbered NLAX 100 (KSC-TO, Folder No. 6670-5-100). The railcar was used infrequently after transporting the access platform (Hoffman 2012b).

Although NLAX 100’s one-of-a-kind design was ideally suited to transport the bulky aft access platform and saved NASA hundreds of thousands of dollars, it was only used to transport specific SSP equipment that one time. Therefore, it is not considered to be a significant contributor to the SSP or any other U.S. Manned Space Program, and it is not considered eligible for the NRHP either individually or as a contributing resource to the NASA KSC Railroad System Historic District.

8BR2924: NLAX 122 and NLAX 123 (**Photo 3-24**) are **90-ft flatcars** with heavy chain tie down capability. The steel flatcars have four axles and a cushioned underframe. The decks of each car are cut out in the middle, and rectangular bulkheads are situated at both ends. Metal tanks are located in the middle of the railcars just below the underdeck. Each car contains as many as 16 winches. NLAX 122 and NLAX 123 were built by Pullman in 1961 and owned by Western Pacific. NLAX 122 had the number WP 85014, and NLAX 123 was WP 85042 (KSC-TO 1987). NASA bought the two cars for \$5,300 each from Ortner Freight Car Co. in September 1982, and Ortner subsequently won the contract to modify the cars. They were used to transport large structural items, vehicles, and

containers (KSC TO, Folder No. Blue Ox Special Hopper Pullman Standard 1976). In summer 1984, NLAX 122 and NLAX 123 carried the gaseous oxygen vent launch complex access arm from KSC to Vandenberg Air Force Base, California, which was under construction at the time (KSC Archives, Folder No. 6630-19). These 90-ft flatcars were not a significant contributor to any U.S. Manned Space Program. Therefore, they are not considered eligible for the NRHP, either individually or as a contributing resource to the NASA KSC Railroad System Historic District.



Photo 3-24. 90-Ft Flatcar, NLAX 123, (8BR2924).
Source: Archaeological Consultants, Inc., January 2012.

8BR2925: NLAX 160 and NLAX 161 (**Photo 3-25**) are **90-ft flatcars** that were modified to transport orbiter convoy purge and cooling tractor-trailer units in support of the SSP. The steel flatcars are 90-ft long, 9 ft-4 in wide, and 3 ft-6 in high (KSC-TO, Folder No. 6670-5-160). They have two axles and cushioned underframes. NLAX 160 weighs 90 tons and has handrails and a short ladder at one end. NLAX 161 weighs 70 tons and has a pair of metal tanks below the underframe and truck ramps at one end. The railcars were both built by the Atchison, Topeka, & Sante Fe Railway Company (ATSF) in 1967 to transport Ford automobile frames. NLAX 160 was ATSF 299970, and NLAX 161 was ATSF 299977 (KSC-TO 1987). NASA leased the cars from ATSF at the beginning of the SSP, and ATSF modified them for \$7,317.41 in 1981 so they could be used to transport the purge and cooling units (KSC-TO, Folder No. 6670-5-160). In 1982, NASA used both flatcars to transport the units to White Sands Space Harbor, New Mexico, after the completion of STS-3, the only shuttle landing at that site (Hoffman 2012b). In 1983, ATSF sold NLAX 160 and NLAX 161 to NASA for \$18,500 each. In 1990, NLAX 160 was painted “NASA Blue” and extra wide bridgeplates were installed on it. NLAX 161 also was repainted and filled with extra wide bridge plates, and received new trucks (KSC-TO, Folder No. 6670-5-161). These railcars were used specifically to support the SSP only one time, and therefore, they are not considered a significant contributor to any U.S. Manned Space Program. Thus, they are not considered individually eligible for the NRHP, nor are they considered a contributing resource to the NASA KSC Railroad System Historic District.



Photo 3-25. 90-Ft Flatcar, NLAX 161, (8BR2925).
Source: Archaeological Consultants, Inc., January 2012.

8BR2926: NLAX 162 and NLAX 163 (**Photo 3-26**) are **90-ft flatcars**. On an inventory dated August 10, 1987, NLAX 162 is noted as a 175-ft, 100-ton flatcar with chain tiedown capabilities to transport vehicles; today, it appears to be a 90-ft flatcar. The inventory also indicates it was built by Bethlehem in 1969 and 1973. Therefore, it is likely that two cars were used to create NLAX 162. The previous numbers for the two cars are SP 900317 and RTTX 159676, and records indicate they were purchased for about \$4,000 in January 1983 (KSC-TO 1987; KSC-TO 2001a). NLAX 163 is also described as having chain tiedown capabilities in the 1987 inventory, where it was listed as a 70-ton flatcar. However, no information is available about when it was built and its previous number. NASA purchased NLAX 163 for about \$4,000 in January 1983 (KSC-TO 2001b). There are three trailers loaded onto NLAX 163 that were reportedly part of the “Langley Project,” a hypersonic wind tunnel initiative dating to the Reagan administration (Crews 2012). These flatcars were not a significant contributor to any U.S. Manned Space Program. Therefore, they are not considered individually eligible for the NRHP, nor are they considered a contributing resource to the NASA KSC Railroad System Historic District.



Photo 3-26. 90-Ft Flatcar, NLAX 163, (8BR2926).
Source: Archaeological Consultants, Inc., January 2012.

8BR2927: NLAX 914 (**Photo 3-27**) is a **100-ton, triple-hopper car** that is used for parts. It is approximately 45 ft long, sits on four axles, and has three hopper doors. The side sheets are 8 ft-9 in tall, and the railcar can hold as much as 3,600 cubic feet (KSC-TO, Folder No. 6670-5-109). NLAX 914 was built in February 1968 by Bethlehem and was once owned by Burlington Northern and designated BN 523098 (KSC-TO 1985). When it was purchased by NASA (at an unknown date), it had the number CSXT 340209, and markings indicate it was once part of the Seaboard System. NLAX 914 was initially numbered NLAX 114 and used for parts because its carbody was found to be in poor condition (Crews 2012). This railcar was not a significant contributor to any U.S. Manned Space Program. Therefore, it is not considered eligible for the NRHP, either individually or as a contributing resource to the NASA KSC Railroad System Historic District.



Photo 3-27. 100-Ton, Triple-Hopper Car, NLAX 914, (8BR2927).
Source: Archaeological Consultants, Inc., January 2012.

8BR2928: NLAX 124 (**Photo 3-28**) is the only **90-ton, 65-ft bulk flatcar** within the NASA KSC Railroad System. The steel railcar sits on two axles and has two bulkheads at both ends with an unobstructed deck. It was built in 1967 by General Steel Industries and owned by the Rock Island Railroad with the number RI 92542 (KSC-TO 1985). It had a capacity of 170,000 pounds and was used to haul lumber. In late 1984, NASA purchased NLAX 124 for \$3,000 from Chicago Pacific Corp., the surviving organization of the Rock Island Railroad. At this time, the car had been unused since March 1980 (KSC-TO, Folder No. 6670-5-124). NLAX 124 was not a significant contributor to any U.S. Manned Space Program. Therefore, it is not considered eligible for the NRHP either individually or as a contributing resource to the NASA KSC Railroad System Historic District.



Photo 3-28. 90-Ton, 65-Ft Bulk Railroad Flatcar, NLAX 124, (8BR2928).
Source: Archaeological Consultants, Inc., January 2012.

8BR2929: NLAX 177, NLAX 178 (**Photo 3-29**), and NLAX 179 are steel, **gondola cars**. NLAX 177 and NLAX 178 each weigh 100 tons and measure approximately 60 ft long, 10 ft-8 in wide, and have side sheets 3 ft-8 in tall with wood floors. NLAX 178 has a roof that is removable in three sections (KSC-TO, Folder No. 6670-5-177). NLAX 177 and NLAX 178 were built by Ortnier in 1966 and owned by the Rock Island Railroad with the numbers RI 3892 and RI 3896 (KSC-TO 1987). NASA bought NLAX 177 for \$3,000 in late 1984 from the Chicago Pacific Corp., formerly the Rock Island Railroad. Early in 1985, NLAX 178 was purchased for an unknown amount from the Chicago Pacific Corp. NLAX 179 is 45 ft long and 9 ft-10 in wide with 3 ft tall side sheets and a weight of 70 tons. The NASA KSC railroad crew fabricated it in 1995 from various railroad cars, including NLAX 006, after which it assisted in track maintenance and served as a spacer car at KSC (KSC-TO, Folder No. 6670-5-179). These three gondola cars were not a significant contributor to any U.S. Manned Space Program. Therefore, they are not considered individually eligible for the NRHP, nor are they considered a contributing resource to the NASA KSC Railroad System Historic District.



Photo 3-29. 60-Ft, 100-Ton Gondola Car, NLAX 178, (8BR2929).
Source: Archaeological Consultants, Inc., January 2012.

8BR2930: NLAX 194 (**Photo 3-30**) is a 44-ft long, **70-ton water car** with a tank that holds approximately 15,000 gallons (KSC-TO 2011). Railings are at both ends of the car, and a manway on the top provides access to the tank. NASA bought the car circa 2000 to eradicate weeds along the NASA KSC railroad tracks. However, the car never received the proper certification for this role (Stephens 2012b). NLAX 194 was refurbished at an unknown date and is marked as a water car. It was not a significant contributor to any U.S. Manned Space Program, and therefore, it is not considered eligible for the NRHP either individually or as a contributing resource to the NASA KSC Railroad System Historic District.

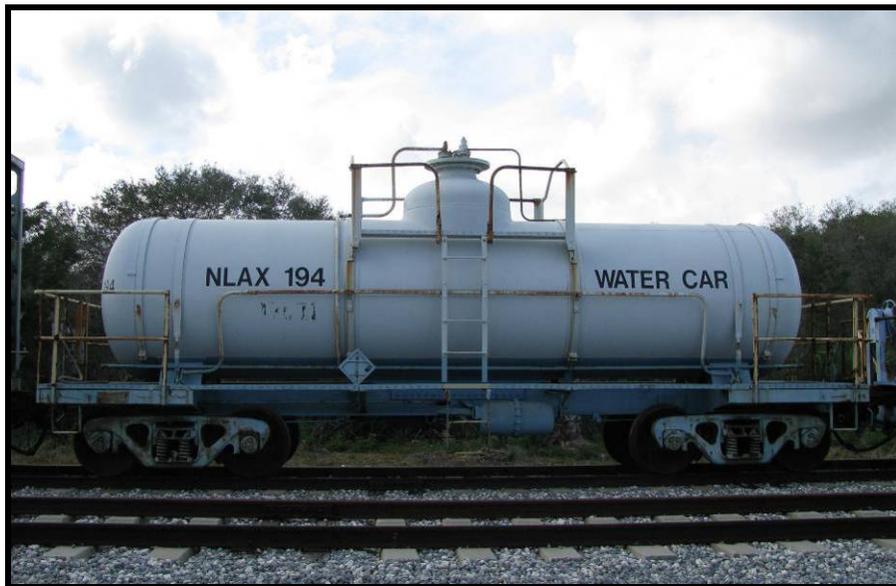


Photo 3-30. 70-Ton Water Car, NLAX 194, (8BR2930).
Source: Archaeological Consultants, Inc., January 2012.

3.6 Locomotive Maintenance Facility (8BR3035)

The LMF (8BR3035) is an Industrial Vernacular style structure constructed ca. 1978 (**Photos 3-31, 3-32**). It features a poured concrete slab foundation, and five steel arches that support the slightly gabled, corrugated metal roof. The east and west sides have corrugated metal wall panels just below the roofline, and the south side contains a partial wall of corrugated metal panels. Within the foundation, there are two sets of railroad tracks and a pit, which allows technicians to work on the undersides of the locomotives and railcars (**Photo 3-33**). Adjacent to the east side of the LMF is a concrete block office building constructed ca. 2010 (**Photo 3-34**), and to the west is a concrete storage building, also constructed in 2010 (**Photo 3-35**). To the northwest of the LMF, there is a ca. 1993 hazardous material staging area, which takes the form of a metal pole barn partially faced with corrugated metal panels, and a ca. 1996 petroleum, oil, and lubricants storehouse made of metal panels (**Photo 3-36**). In addition, there is a ca. 1996 abrasive recovery building, constructed of a steel skeleton faced with corrugated metal panels (**Photo 3-37**).

Since its construction ca. 1978, the LMF has provided a sheltered area where KSC's railroad technicians could refurbish and maintain the Center's locomotives and railcars, or various ground support equipment items. Although considered part of the NASA KSC Railroad System to which it provided general support, the LMF is neither distinguished by significant historical associations to events or persons in the context of the U.S. Manned Space Program, nor by its architectural features. Additionally, because of the very recent construction dates of the five ancillary features, none has significantly contributed to manned space flight. Therefore, the LMF or the ancillary buildings are not considered eligible for the NRHP either individually or as contributing resources to the NASA KSC Railroad System Historic District.



Photo 3-31. LMF, facing north.

Source: Archaeological Consultants, Inc., January 2012.



Photo 3-32. LMF, facing southwest.
Source: Archaeological Consultants, Inc., January 2012.



Photo 3-33. Pit in floor of LMF, facing northwest.
Source: Archaeological Consultants, Inc., January 2012.



Photo 3-34. Ca. 2010 office building (K6-1844D), facing northwest.
Source: Archaeological Consultants, Inc., January 2012.



Photo 3-35. Ca. 2010 storage building (K6-1844E), facing northeast.
Source: Archaeological Consultants, Inc., January 2012.



Photo 3-36. Ca. 1993 hazardous material staging area (K6-1844A; left) and ca. 2006 petroleum, oil, and lubricants storehouse (K6-1844C), facing northwest.
Source: Archaeological Consultants, Inc., January 2012.



Photo 3-37. Ca. 1996 abrasive recovery building (K6-1844B), facing northwest.
Source: Archaeological Consultants, Inc., January 2012.

3.7 NASA KSC Railroad System Historic District (8BR2932)

The NASA KSC Railroad System Historic District is comprised of an approximately 19-mile segment of the west branch of the railroad track (8BR2931), the Jay Jay Bridge (H2-1198; 8BR2906), the three locomotives (8BR2923, 8BR3043, 8BR3044), and the two 70-ton aft skirt cars (NLAX 170 and 171; 8BR2908 and 8BR3042). The portion of the railroad track that contributes to the district is that segment that extends from the Jay Jay Yard east to Wilson's Corner; the portion of the west branch from Wilson's Corner to just south of Schwartz Road; the small spur to Suspect Siding; and the small spur at the RPSF (see **Figure 3-1**). The Jay Jay Bridge is embedded within the section between Jay Jay Yard and Wilson's Corner.

The NASA KSC Railroad System Historic District is considered eligible for inclusion on the NRHP in the context of the U.S. Space Shuttle Program (ca. 1969 - 2011) under Criterion A for its significant historical associations in the areas of Space Exploration and Transportation. Because it has achieved exceptional national significance in the last 50 years, Criteria Consideration G applies. The period of significance for the NASA KSC Railroad System Historic District extends from 1978, when the first flight SRM segments arrived at KSC, to 2010, when the final set of SRM segments arrived at the Center. The railroad track, including the bridge, was used throughout the SSP to carry fueled and spent SRM segments from KSC to the Jay Jay Yard (Heiney 2011; *Spaceport News* 2001). Because of the size of the SRM segments (12-foot wide), weight (150-tons each), and hazardous nature, shipment by rail was the only practical means of transport (Heiney 2011).

The three locomotives were crucial to the NASA KSC railroad's support of the SSP; everything that entered the KSC from 1984 to 2011 via the railroad was transported by one of these three locomotives. In addition, the railroad supported the delivery of SRB aft skirts, forward skirts, and frustums from California to KSC, via the NLAX 170 and NLAX 171 railcars. Each of these cars was capable of carrying one frustum, one forward skirt, and two aft skirts.

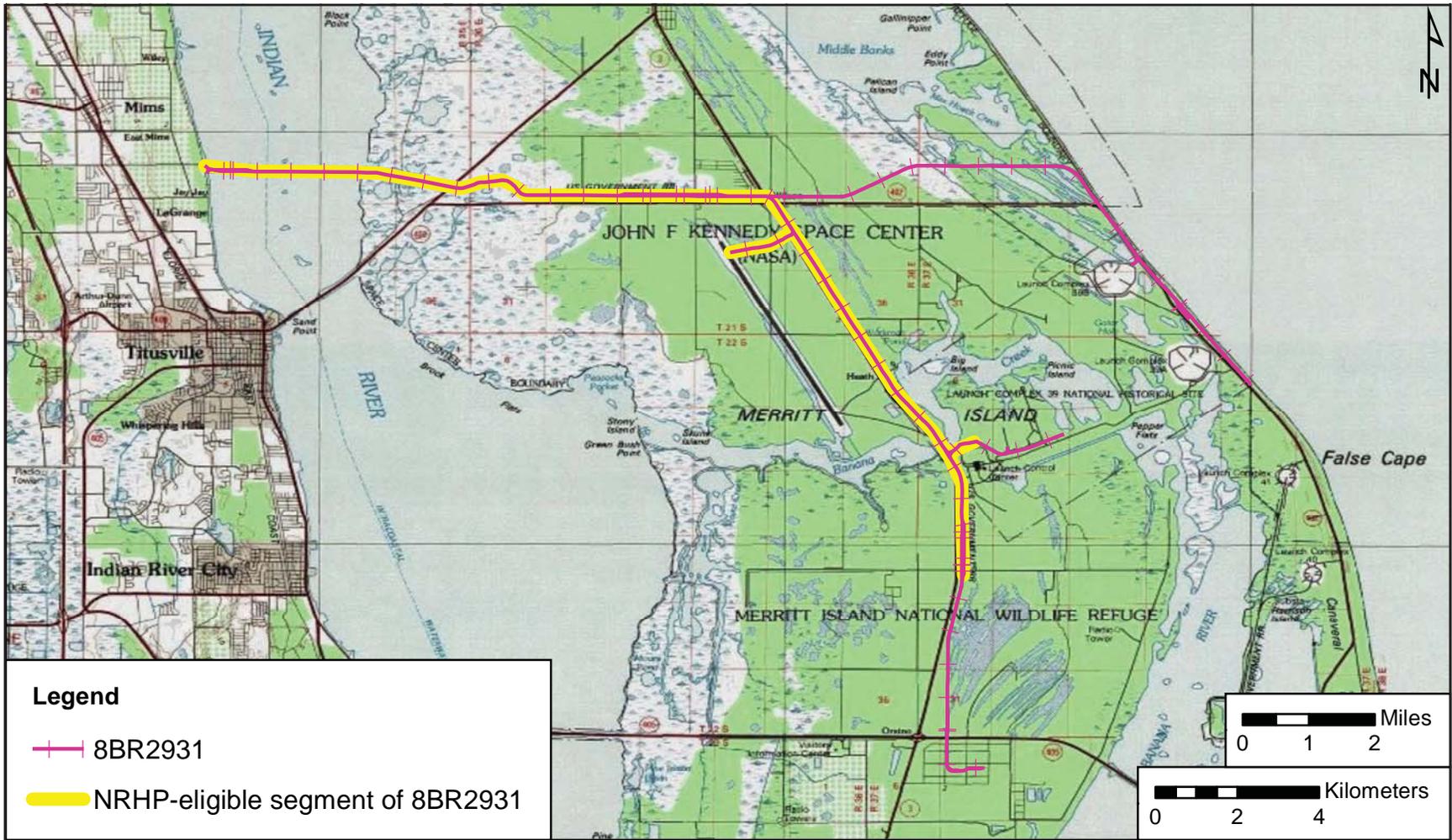


Figure 3-1. Location of NASA KSC Railroad Track (8BR2931) and the NRHP-eligible segment.



4.0 CONCLUSIONS

The history of the NASA KSC Railroad System begins with the original planning efforts for the Center itself. The original master plan for the Center depicted a railroad system to deliver construction supplies, and operations and maintenance supplies for U.S. Manned Space Programs. Although it failed to live up to its promise during the Apollo era, the railroad was used on a regular basis during the SSP as a means of transporting SRMs, an essential component of the Space Shuttle vehicle.

Research and field survey conducted in January 2012 resulted in the identification of 81 assets, including 38 miles of track, the Jay Jay Railroad Draw Bridge, three locomotives, 75 freight cars, and the Locomotive Maintenance Facility. None of these resources was considered individually eligible for listing in the NRHP. However, a NASA KSC Railroad System Historic District (8BR2932) was defined, which includes the following contributing resources: a 19-mile portion of the railroad track (8BR2931), used for the delivery of SRM segments; the ca. 1963 single-leaf, bascule Jay Jay Bridge (8BR2906); the three locomotives (8BR2923, 8BR3043, 8BR3044), acquired by NASA in 1984; and the two 70-ton aft skirt cars, NLAX 170 and 171 (8BR2908, 8BR3042), built for NASA in 1985.

The historic district is considered eligible in the context of the SSP under Criterion A for its significant historical associations in the areas of Space Exploration and Transportation. Because it has achieved exceptional national significance in the last 50 years, Criteria Consideration G applies. The railroad system was used throughout the SSP to carry SRB components between the Jay Jay Yard and various facilities within KSC. The three locomotives moved SRM segments within KSC, as well as the SRB aft skirts, forward skirts, and frustums via the NLAX 170 and NLAX 171 railcars. The NASA KSC Railroad System Historic District maintains a high level of integrity of location, setting, materials, design, workmanship, feeling, and association.

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APPENDIX A: FMSF Forms



RESOURCE GROUP FORM
FLORIDA MASTER SITE FILE
Version 4.0 1/07

Site #8 BR02931
Field Date 1-23-2012
Form Date 2-27-2012
Recorder#

[X] Original
[] Update

NOTE: Use this form to document districts, landscapes, building complexes and linear resources as described in the box below. Cultural resources contributing to the Resource Group should also be documented individually at the Site File. Do not use this form for National Register multiple property submissions (MPSs).

Check ONE box that best describes the Resource Group:

- [] Historic district
[] Archaeological district
[] Mixed district
[] Building complex
[] Designed historic landscape
[] Rural historic landscape
[X] Linear resource

Resource Group Name NASA KSC Railroad Track Multiple Listing [DHR only]
Project Name
National Register Category (please check one): []building(s) [X]structure []district []site []object
Linear Resource Type (if applicable): []canal [X]railway []road []other (describe):
Ownership: []private-profit []private-nonprofit []private-individual []private-nonspecific []city []county []state [X]federal []Native American []foreign []unknown

LOCATION & MAPPING

Street Number Direction Street Name Street Type Suffix Direction
Address: Kennedy Space Center
City/Town (within 3 miles) Titusville In Current City Limits? []yes [X]no []unknown
County or Counties (do not abbreviate) Brevard
Name of Public Tract (e.g., park)
1) Township Range Section 1/4 section: []NW []SW []SE []NE Irregular-name:
2) Township Range Section 1/4 section: []NW []SW []SE []NE
3) Township Range Section 1/4 section: []NW []SW []SE []NE
4) Township Range Section 1/4 section: []NW []SW []SE []NE
USGS 7.5' Map(s) 1) Name USGS Date
2) Name USGS Date
Plat, Aerial, or Other Map (map's name, originating office with location)
Landgrant
Verbal Description of Boundaries (description does not replace required map) see continuation sheet.

Table with 3 columns: DHR USE ONLY, OFFICIAL EVALUATION, DHR USE ONLY. Contains fields for NR List Date, Owner Objection, SHPO/KEEPER criteria, and dates.

HISTORY & DESCRIPTION

Construction Year: 1963 [X]approximately []year listed or earlier []year listed or later

Architect/Designer(last name first): Builder(last name first): see continuation sheet

Total number of individual resources included in this Resource Group: # of contributing 1 # of non-contributing

Time period(s) of significance (choose a period from the list or type in date range(s), e.g. 1895-1925)

- 1. ca. 1963-2010 3. 2. 4.

Narrative Description (National Register Bulletin 16A pp. 33-34; fit a summary into 3 lines or attach supplementary sheets if needed) see continuation sheet

RESEARCH METHODS (check all that apply)

- [X]FMSF record search (sites/surveys) [X]library research []building permits []Sanborn maps
[X]FL State Archives/photo collection []city directory [X]occupant/owner interview [X]plat maps
[]property appraiser / tax records [X]newspaper files []neighbor interview [X]Public Lands Survey (DEP)
[X]cultural resource survey [X]historic photos []interior inspection []HABS/HAER record search
[]other methods (specify)

Bibliographic References (give FMSF Manuscript # if relevant) see continuation sheet

OPINION OF RESOURCE SIGNIFICANCE

Potentially eligible individually for National Register of Historic Places? []yes [X]no []insufficient information

Potentially eligible as contributor to a National Register district? [X]yes []no []insufficient information

Explanation of Evaluation (required, see National Register Bulletin 16A p. 48-49. Attach longer statement, if needed, on separate sheet.) see continuation sheet

Area(s) of Historical Significance (see National Register Bulletin 15, p. 8 for categories: e.g. "architecture", "ethnic heritage", "community planning & development", etc.)

- 1. Other 3. 5. 2. Transportation 4. 6.

DOCUMENTATION

Accessible Documentation Not Filed with the Site File - including field notes, analysis notes, photos, plans and other important documents

1) Document type All materials at one location Maintaining organization Archaeological Consultants Inc
Document description File or accession #'s P9026Q

2) Document type Maintaining organization
Document description File or accession #'s

RECORDER INFORMATION

Recorder Name Trish Slovinac Affiliation Archaeological Consultants Inc

Recorder Contact Information 8110 Blaikie Court, St A, Sarasota, FL 34240/941-379-6206/ACIFloridaAcomcast.net
(address / phone / fax / e-mail)

Required Attachments
1 PHOTOCOPY OF USGS 7.5' MAP WITH DISTRICT BOUNDARY CLEARLY MARKED
2 LARGE SCALE STREET, PLAT OR PARCEL MAP WITH RESOURCES MAPPED & LABELED
3 TABULATION OF ALL INCLUDED RESOURCES (name, FMSF #, contributing? Y/N, resource category, street address or township-range-section if no address)
4 PHOTOS OF GENERAL STREETScape OR VIEWS (Optional: aerial photos, views of typical resources)
Photos may be archival B&W prints OR digital image files. If submitting digital image files, they must be included on disk or CD AND in hard copy format (plain paper is acceptable). Digital images must be at least 1600 x 1200 pixels, 24-bit color, jpeg or tiff.

CONTINUATION SHEET**Location and Mapping***Township/Range/Section*

21S/35E/21, 23, 24
21S/36E/19, 20, 21, 22, 23, 24, 26, 27, 35, 36
21S/37E/19, 20, 21, 27, 28, 34
22S/36E/1, 12
22S/37E/2, 3, 7, 8, 18, 19, 30, 31
23S/37E/5

USGS 7.5' Maps:

False Cape, Fla. 1976, PI 1984
Mims, Fla. 1949, PR 1970
Orsino, Fla. 1976
Wilson, Fla. 1949, PR 1979

Verbal Description of Boundaries

The west boundary of the NASA Railroad is the point where it meets the Florida East Coast Line in Titusville. There are two south boundaries: one where the west branch ends within the Kennedy Space Center (KSC) Industrial Area, the other where the east branch reaches the boundary between KSC and Cape Canaveral Air Force Station (CCAFS). There is also an east boundary at the Compressor/Converter Facility, just east of the Vehicle Assembly Building (VAB) Area. The width of the resource is defined as the width of the railroad bed.

Narrative Description

The NASA Railroad at Kennedy Space Center is categorized as a standard gauge industrial short line, with an approximate total length of 38 miles. Originally, the line was constructed of 100- or 112-pound jointed rail with wood crossties and limestone ballast. Circa 1983, the NASA installed 132-pound continuous-welded rail and a combination of concrete and wood crossties, "because of the hazardous commodities hauled over the railroad, particularly the solid rocket boosters for the space shuttle" (NASA 2007). The rebuilt line maintained the footprint/path of the original track; the limestone ballast was replaced with granite in the mid-1980s (NASA KSC Archives Department 1983).

The NASA railroad begins west of the Jay Jay Yard, where the tracks form a junction with the main FEC rail line. The Jay Jay Yard is a four-track yard, reduced from the original seven-track yard ca. 1986 (NASA KSC Archives Department 1986). From Jay Jay Yard, the NASA Railroad crosses the Indian River via the Jay Jay Bridge (8BR2906), a ~0.5 mile-long, single-leaf, bascule bridge, constructed ca. 1963. The track then extends east for ~7 miles to Wilson's Corner (roughly the intersection of State Highway 402 and Kennedy Parkway North). Along the way, there are two yards, the West Wilson Yard, which consists of two tracks, and the Wilson Yard, which consists of four tracks. At Wilson's Corner, the Railroad splits into two branches. The east branch, with a length of ~9 miles, extends eastward to Playalinda Beach, and then curves southeast to parallel the Atlantic coastline. From this branch, there is a small spur (~0.2 miles) that extends to Launch Complex 39A and one (~0.2 miles) that extends to Launch Complex 39B; just northeast of Complex 39A is the East Yard, a two-track yard. The east branch of the NASA railroad ends at the boundary between KSC and CCAFS.

The west branch of the railroad, with a total length of ~11 miles, extends from Wilson's Corner extends southeast to the KSC VAB Area. Just over one-half mile from Wilson's Corner, there is a ~0.5-mile spur

CONTINUATION SHEET

west toward the Shuttle Landing Facility, which is referred to as Suspect Siding. At the north end of the VAB Area, there is a ~1.7-mile spur that extends east toward the Rotation, Processing and Surge Facility. Just prior to reaching the facility, it splits into two, with one branch going into the facility, and the second continuing past the building and on to the Compression/Converter Facility. Toward the south end of the VAB Area, the west branch curves to travel southward to the Industrial Area. Along the way, it extends through the ~0.83 mile-long, four-track Locomotive Maintenance Facility, located north of Schwartz Road. Within the Industrial Area, just south of 3rd Street, the west branch curves to the east, and passes by KSC's main supply warehouses.

Explanation of Evaluation

The NASA KSC Railroad Track has been used to carry a variety of materials and spacecraft components. Both the east and west branches have been used to transport generic GSE and construction materials to various locations on the center. The east branch was used for fuel and oxidizer shipments to CCAFS, as well as Air Force Titan rocket and Navy Trident missile deliveries. The west branch was used throughout the SSP to carry fueled SRM segments from Utah to KSC and spent SRM segments from KSC to Utah. It also supported the delivery of SRM segments for the Ares I-X flight test (Heiney 2011; *Spaceport News* 2001). As a whole, in view of its largely general support function vis a vis the U.S. Manned Space Programs, the NASA KSC Railroad Track is not considered individually eligible for listing in the NRHP. However, a roughly 19-mile portion of the track, used for the delivery of SRM segments, is considered contributing to the NRHP-eligible NASA KSC Railroad System Historic District (8BR2932).

Bibliographic References

Heiney, Anna.

2011 "NASA Railroad Played Vital Role in Shuttle Booster Haul." *Spaceport News*. 11 February:6.

NASA KSC, Archives Department

1983 Box 3, Folder No. 6670-2-1983.

1986 Box 3, Folder No. 6670-2-1986.

Spaceport News

2001 Inside KSC Railroad. 8 June:4.



PHOTOGRAPHS



Jay Jay Yard, facing west



Track over Jay Jay Bridge, facing west



PHOTOGRAPHS



Track between Jay Jay Yard and Wilson's Corner, facing east



Wilson Yard, facing west



PHOTOGRAPHS



Track extending toward Playalinda Beach, facing east



Track near Launch Complex 39, Pads A and B, facing north



PHOTOGRAPHS



Track north of the Vehicle Assembly Building, facing south



Track near the Rotation, Processing and Surge Facility, facing west



PHOTOGRAPHS



Track near the Locomotive Maintenance Facility, facing south



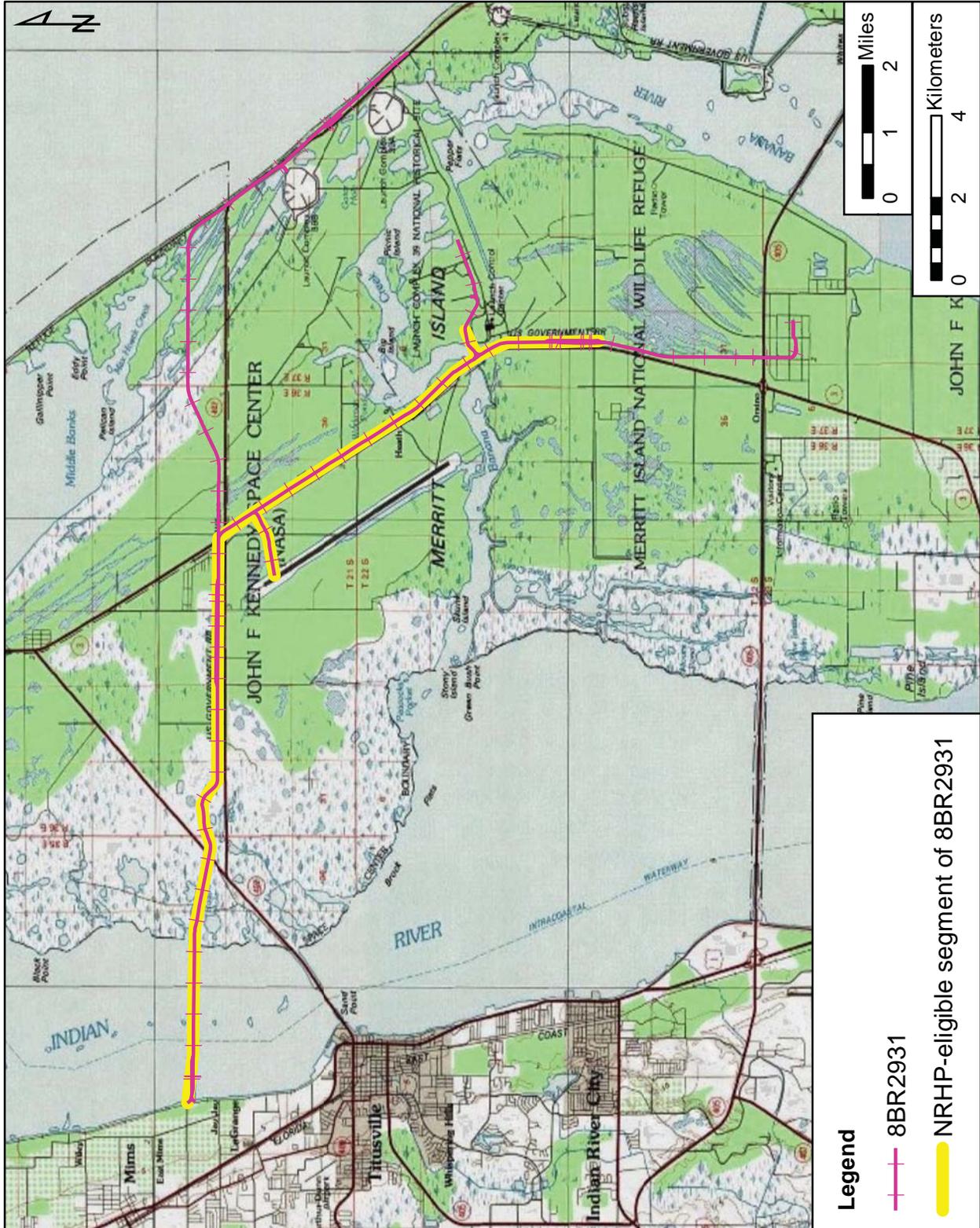
Track within the KSC Industrial Area, facing northwest



USGS

21S/35E/21, 23, 24
 21S/36E/19, 20, 21, 22, 23, 24, 26, 27, 35, 36
 21S/37E/19, 20, 21, 27, 28, 34
 22S/36E/1, 12
 22S/37E/2, 3, 7, 8, 18, 19, 30, 31
 23S/37E/5

False Cape, Fla. 1976, PI 1984
 Mims, Fla. 1949, PR 1970
 Orsino, Fla. 1976
 Wilson, Fla. 1949, PR 1979





HISTORICAL BRIDGE FORM

FLORIDA MASTER SITE FILE

Version 4.0 1/07

Site #8 BR02906
Field Date 1-26-2012
Form Date 2-21-2012
Recorder # 1
FDOT Bridge # _____

Original
 Update

Consult *Guide to the Historical Bridge Form* for detailed instructions

Bridge Name(s) Jay Jay Railroad Draw Bridge Multiple Listing (DHR only) _____
Project Name Historic Survey of NASA Railroad System Survey # (DHR only) _____
Ownership: private-profit private-nonprofit private-individual private-nonspecific city county state federal Native American foreign unknown

LOCATION & MAPPING

Route(s) Carried/Feature(s) Crossed NASA Railroad/Indian River
USGS 7.5 Map Name MIMS USGS Date 1989 Plat or Other Map _____
City/TOWN (within 3 miles) Titusville In City Limits? yes no unknown County Brevard
Township 21S Range 35E Section 21 ¼ section: NW SW SE NE Irregular-name: _____
Township _____ Range _____ Section _____ ¼ section: NW SW SE NE
Landgrant _____ Tax Parcel # _____
UTM Coordinates: Zone 16 17 Easting 518718 Northing 3169440
Other Coordinates: X: _____ Y: _____ Coordinate System & Datum _____
Name of Public Tract (e.g., park) _____

HISTORY

Year Built 1963 approximately year listed or earlier year listed or later
Still in use? yes no restricted use (describe) _____
Prior Fords, Ferries, or Bridges at this Location None

Bridge Use: original and current with dates (standard descriptions: auto, railway, pedestrian, fishing pier, abandoned) Railway bridge, 1963-present

Ownership history Florida East Coast Railway Company, 1963-1983; National Aeronautics and Space Administration, 1983-present

Designers/Engineers Nashville Bridge Co., L.O. Hopkins, and Maurice H. Connell

Builders/Contractors Contractor: Florida East Coast Railway Company

Text of Plaque or Inscription None

Narrative History (How did bridge come to be built? How was it financed?, etc.) In 1963, the federal government contracted the Florida East Coast to build a 7.5 mile spur from their railroad track north of Titusville to what would become known as the Kennedy Space Center. The bridge was built to cross the Indian River.

DESCRIPTION

GENERAL

Overall Bridge Design 1. Movable--Bascule 2. Stringer--Multi Beam

Overall Condition excellent good fair deteriorated ruinous

Style and Decorative Details See continuation sheet

Tender Station Description See continuation sheet

Alterations: Dates and Descriptions See continuation sheet

DHR USE ONLY		OFFICIAL EVALUATION		DHR USE ONLY	
NR List Date _____	SHPO - Appears to meet criteria for NR listing: <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> insufficient info	Date _____	Init. _____		
<input type="checkbox"/> Owner Objection	KEEPER - Determined eligible: <input type="checkbox"/> yes <input type="checkbox"/> no	Date _____			
	NR Criteria for Evaluation: <input type="checkbox"/> a <input type="checkbox"/> b <input type="checkbox"/> c <input type="checkbox"/> d (see <i>National Register Bulletin 15</i> , p. 2)				

DESCRIPTION (continued)

SUPERSTRUCTURESpans: Number 75 Total Length(ft) 2,058Main Spans: Number 1 Length(ft) 157 Width(ft) 24 Roadway width(ft) 6Main Span Design Movable--BasculeMain Span Materials 1. Steel 2. ConcreteApproach Spans: Number 74 Length(ft) 25 Width(ft) 14 Roadway width(ft) 6Approach Span Design Stringer--Multi BeamApproach Span Materials 1. Concrete 2. SteelDeck Materials 1. Wood 2. Steel**SUBSTRUCTURE**Abutment Materials 1. Pre-cast Concrete 2. SteelAbutment Description Concrete seawall with steel rods and rocks along slope.Pier Materials 1. Pre-cast Concrete 2. SteelPier Description Bents, piles, and caps. Bents have from six to three piles.

RESEARCH METHODS (check all that apply)

- | | | | |
|--|--|---|--|
| <input type="checkbox"/> FDOT database search | <input checked="" type="checkbox"/> Fla. Archives / photo collection | <input checked="" type="checkbox"/> newspaper files | <input type="checkbox"/> informal archaeological inspection |
| <input type="checkbox"/> HABS/HAER record search | <input type="checkbox"/> property appraiser / tax records | <input type="checkbox"/> city directory | <input type="checkbox"/> formal archaeological survey |
| <input checked="" type="checkbox"/> FMSF record search (sites/surveys) | <input checked="" type="checkbox"/> library research | <input type="checkbox"/> Public Lands Survey (DEP) | <input checked="" type="checkbox"/> cultural resource survey |
| <input type="checkbox"/> Other methods (specify) _____ | | | |

Bibliographic References (give FMSF manuscript # if relevant, use separate sheet if needed) See continuation sheet

OPINION OF RESOURCE SIGNIFICANCE

Potentially eligible individually for National Register of Historic Places? yes no insufficient informationPotentially eligible as contributor to a National Register district? yes no insufficient informationExplanation of Evaluation (required, use separate sheet if needed) See continuation sheetArea(s) of historical significance (See *National Register Bulletin 15*, p. 8 for categories: e.g. "architecture", "ethnic heritage", "community planning & development", etc.)1. Other

3. _____

5. _____

2. Engineering

4. _____

6. _____

DOCUMENTATION

Accessible Documentation Not Filed with the Site File - including field & analysis notes, photos, plans, other important documents

- | | |
|---|--|
| 1) Document type <u>All materials at one location</u> | Maintaining organization <u>Archaeological Consultants Inc</u> |
| Document description _____ | File or accession #'s <u>P9026Q</u> |
| 2) Document type _____ | Maintaining organization _____ |
| Document description _____ | File or accession #'s _____ |

RECORDER INFORMATION

Recorder Name Christopher Berger Affiliation Archaeological Consultants IncRecorder Contact Information 8110 Blaikie Court, Ste A, Sarasota, FL 34240; 941-379-6206; ACIFlorida@comcast.net
(address / phone / fax / e-mail)**Required Attachments****① USGS 7.5' TOPO MAP WITH BRIDGE LOCATION MARKED****② PHOTO OF BRIDGE, ARCHIVAL B&W PRINT OR DIGITAL IMAGE FILE**If submitting an image file, it must be included on disk or CD AND in hard copy format (plain paper is acceptable).
Digital image must be at least 1600 x 1200 pixels, 24-bit color, jpeg or tiff.

CONTINUATION SHEET**Narrative Description:**

The Jay Jay Railroad Draw Bridge (Jay Jay Bridge; H2-1198) carries the NASA Railroad over the Intracoastal Waterway (Indian River) at the Kennedy Space Center (KSC) in Brevard County, Florida. The Florida East Coast (FEC) Railroad mainline is about 2,500' to the west of the Jay Jay Bridge, and railcars and locomotives must traverse its single, standard-gauge track to reach KSC facilities on the east side of the Indian River. The bridge is 2,058' long and made up of 75 spans supported by 72 bents, two end bents, and two piers. A 158' x 20' single leaf, through-girder bascule steel span with floorbeams and stringers crosses a 90' channel, and the other 74 spans are fixed steel deck steel girders with an open deck that measures 24'-8" x 14'.

Substructure

Jay Jay Bridge's concrete substructure is made up of 72 bents, two end bents, and two piers. There are 62 concrete bents with three piles, and 10 concrete bents with six piles. Each concrete pile is about 20" x 20", is either rounded or squared, and rises about 3'-6" above the waterline. Concrete caps that measure 3'-6" tall are placed on top of all the piles. The two reinforced concrete end bent walls are protected by a concrete seawall reinforced by steel rods, packed earth, and riprap slope protection. Pier 1 is an irregularly shaped, partially submerged reinforced concrete pit along the west side of the channel that houses the bascule's machinery and its trunnion and counterweight. The pier measures 53' x 42'-3", stands 34'-2" tall, and rests on a concrete slab 14' thick. Wooden catwalks branch off from the bridge and lead to concrete platforms on top of the north and south sides of the pier. Access to Pier 1's pit is gained through a hatch with a steel door on the south platform, and two ladders lead to the pier's floor, which is kept dry by a sump pump. Pier 2 is an irregularly shaped reinforced concrete wall along the east side of the channel that measures 33' long, 8'-8" at its thickest, and 24'-7" deep. The bascule span rests on Pier 2 when lowered.

Bascule

The steel bascule span is a Hopkins Frame-mounted, single leaf, through-girder with floorbeams. The span is curved at the trunnions and measures 157' long and 24' wide with approximately 10' sidewalls. The two Hopkins Frame trunnions are the mechanisms used to raise and lower the bridge and resemble two quarter circles with gears. In addition to the trunnions, the bascule span includes a counterweight and six segments with beams and X-braces. When the bridge is lowered, two span locks securely connect it to Pier 2.

Superstructure

Steel plates on top of the concrete bent caps separate the substructure from the superstructure. All 75 steel spans consist of two girders, three beams, and four cross braces. The girders are 24'-8" long and 2'-9 1/4" tall and run parallel to each other; the beams are 5'-8" long and are perpendicular to the girders; and the cross braces are 7' long.

Steel plates also are used to separate the spans and wooden railroad ties, and all three are bolted together. The ties are 8"x8" wide and the lengths alternate between three, 9' ties for every 14' tie. The 14' ties extend on the north side of the tracks to support the wooden walkway, which consists of four rows of planks placed end to end and a braced wooden railing. Standard gauge steel railroad tracks are secured to the ties; in addition, wood ties placed end to end run parallel to the railroad tracks on either side. At the bascule span, all the ties are 9' long and a double plank timber walkway runs through the middle of the tracks.

Control house

Access to the control house is gained from the same concrete platform that encompasses the hatch that leads down to Pier 1's pit. The control house itself rests on a concrete platform supported by four concrete

CONTINUATION SHEET

piles; the exterior shell was replaced in 2008 (Washburn 2012). The metal building has a gable roof, and entrance is gained through a metal door on the north elevation. Single 6/6 metal sash windows are located on the west and south elevations. The room is divided into two sections: the larger main room contains the equipment that operates the bridge, and a smaller room to the west is used for storage.

Channel

An approximately 186' long stretch of concrete piles with wooden fenders line both sides of the channel to protect the Jay Jay Bridge from being struck by boats. Five timber wales are attached to the piles, each of which has two or three piers. Catwalks with wooden decks and metal rails have been built on top of the fender piles. Seven pile clustered dolphins are at the northwest, northeast, southeast, and southwest corners of the concrete piles to provide further protection.

Operation

The control house is not manned, so the Jay Jay Bridge is usually in a fully open position with green lights flashing to indicate that vessels are free to pass. The Code of Federal Regulations dated July 1, 2005, describes the bridge's operation:

When a train approaches the bridge, it stops and the operator initiates a command to lower the bridge. The lights go to flashing red and the draw lowers and locks, providing scanning equipment reveals nothing under the draw. The draw remains down until a manual raise command is initiated, or will raise automatically 5 minutes after the intermediate track circuit is no longer occupied by a rail car. After the train has cleared, the draw opens and the lights return to flashing green.

History

Jay Jay Bridge was constructed in 1963 as part of a 7 ½-mile railroad that linked the FEC mainline to the Kennedy Space Center. First, fill was dredged from the bottom of the Indian River due south of the bridge to create an approximately 1,500' long peninsula on the west side of the river and an approximately 2,000' long peninsula on the east.

Multiple entities were involved in Jay Jay Bridge's construction. The stringer-multibeam approach spans were designed by Maurice H. Connell and Associates of Miami, Florida. The Tennessee's Nashville Bridge Company designed and assembled the bascule main span and approach. L.O. Hopkins of Nashville, Tennessee, designed the channel piers and fenders.

During the Apollo Program era, heavy materials used to construct KSC were carried across the bridge. Beginning with the first flight of the Space Shuttle Program (SSP) in 1981, railroad cars that carried solid rocket booster (SRB) segments traveled across the bridge, and SRB segments and other components used to facilitate the SSP continued to be hauled across Jay Jay Bridge until the end of the SSP in 2011.

In June 1983, NASA purchased from FEC the 7 ½-mile railroad segment built in 1963, including Jay Jay Bridge, and the bridge underwent much needed repairs. The channel lights and deteriorated fenders were repaired in early 1985 by Inter-Bay Marine Construction, and later that year the electrical system was rewired. The bridge was closed for seven days in early 1987 as a subcontractor replaced a deteriorated span. In mid-1989, EG&G workers sandblasted and painted the bridge, work that limited boat passage to every hour and half hour. By August of that year, seven spans had been reinforced.

Several more repairs have been made to the bridge in the intervening years, including the installation of pile jackets; repairs and replacements to the railing, walkways, piles, and fender system; upgrades to the

CONTINUATION SHEET

electrical and mechanical operating system; replacement of the exterior shell of the tender station in 2008; and repainting (Washburn 2012).

Explanation of Evaluation:

While noteworthy for its significant historical associations, the Jay Jay Bridge was built to a standard plan for railroad bridges and is not distinguished by its engineering or design. Therefore, it is not considered individually eligible for the NRHP listing. However, the Jay Jay Bridge is considered a contributing resource to the NASA Railroad System Historic District (see Section 3.6). The bridge is the only railroad span to link the FEC mainline to KSC facilities and played an integral role in support of the SSP, most notably in the transportation of new and used SRM segments. The bridge has undergone repairs necessitated by its corrosive environment, yet it has retained its original bascule span and mechanisms and integrity of location, design, setting, materials, workmanship, feeling, and association.

Bibliography

Code of Federal Regulations

- 2005 33 CFR Ch. I. 117.261, Atlantic Intracoastal Waterway from St. Mary's River to Key Largo," July 1.

Heiney, Ann

- 2010 "NASA Railroad Keeps Shuttle's Boosters on the Right Track." *Space Shuttle Era: Celebrating a Technological Marvel*. December 23. Accessed on March 2, 2012, http://www.nasa.gov/mission_pages/shuttle/flyout/railroad.html.

Maurice H. Connell and Associates & Nashville Bridge Company

- 1963 As-built drawings, Jay Jay Bridge. File No. 352475530-VEN5722, provided by Frank Washburn.

NASA KSC Archives Department

- Var. Box 3, Folder No. 6670-2-13

Spaceport News

- 1987 Railroad Bridge Repairs Avoid Schedule Boggles. 27 March:7.
1989a Drawbridge Painting Limits Boat Traffic. 21 April:8.
1989b Working on the Railroad. 25 August:3.

Transystems

- 2011 *Biennial Inspection and Evaluation of Bridges at Kennedy Space Center, FL*.

Washburn, Frank (KSC Bridge technician)

- 2012 Interview by Christopher Berger and Patricia Slovinac. 26 January. Notes on file at Archaeological Consultants Inc., Sarasota.



PHOTOGRAPHS



Jay Jay Bridge aerial photograph.



Jay Jay Bridge facing southeast.



PHOTOGRAPHS



Jay Jay Bridge down, facing west.



Jay Jay Bridge upright, after crewmember activated span, facing west.



PHOTOGRAPHS



Jay Jay Bridge bascule lowered, facing east.

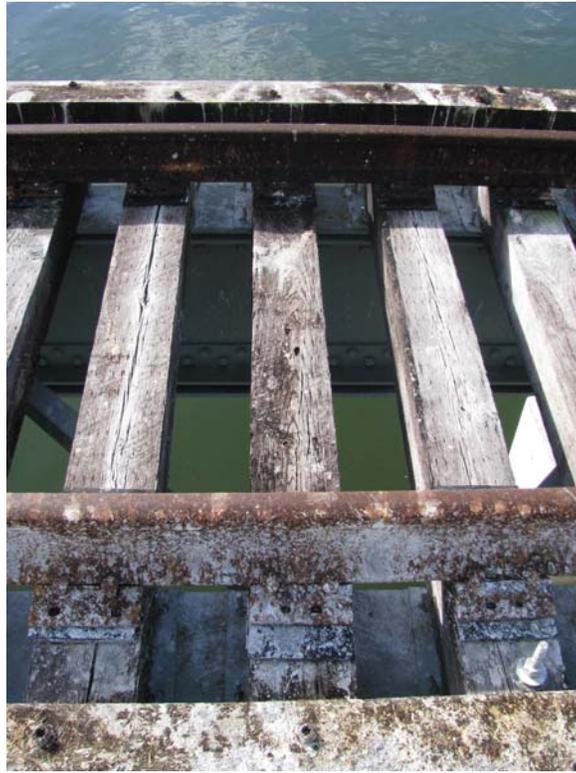


Locomotive 2 on Jay Jay Bridge facing east.



HISTORIC BRIDGE FORM PHOTOGRAPHS

Site # 8BR2906



Jay Jay Bridge track detail.



Jay Jay Bridge bascule tracks being lowered, facing northeast.



PHOTOGRAPHS



Jay Jay Bridge bascule concrete pit with span up, facing west.



Jay Jay Bridge bascule gears, while bridge is being lowered.



PHOTOGRAPHS



Jay Jay Bridge east approach abutment, facing northeast.



Jay Jay Bridge representative piles, facing southwest.



PHOTOGRAPHS



Jay Jay Bridge superstructure.



Jay Jay Bridge tender station with fenders

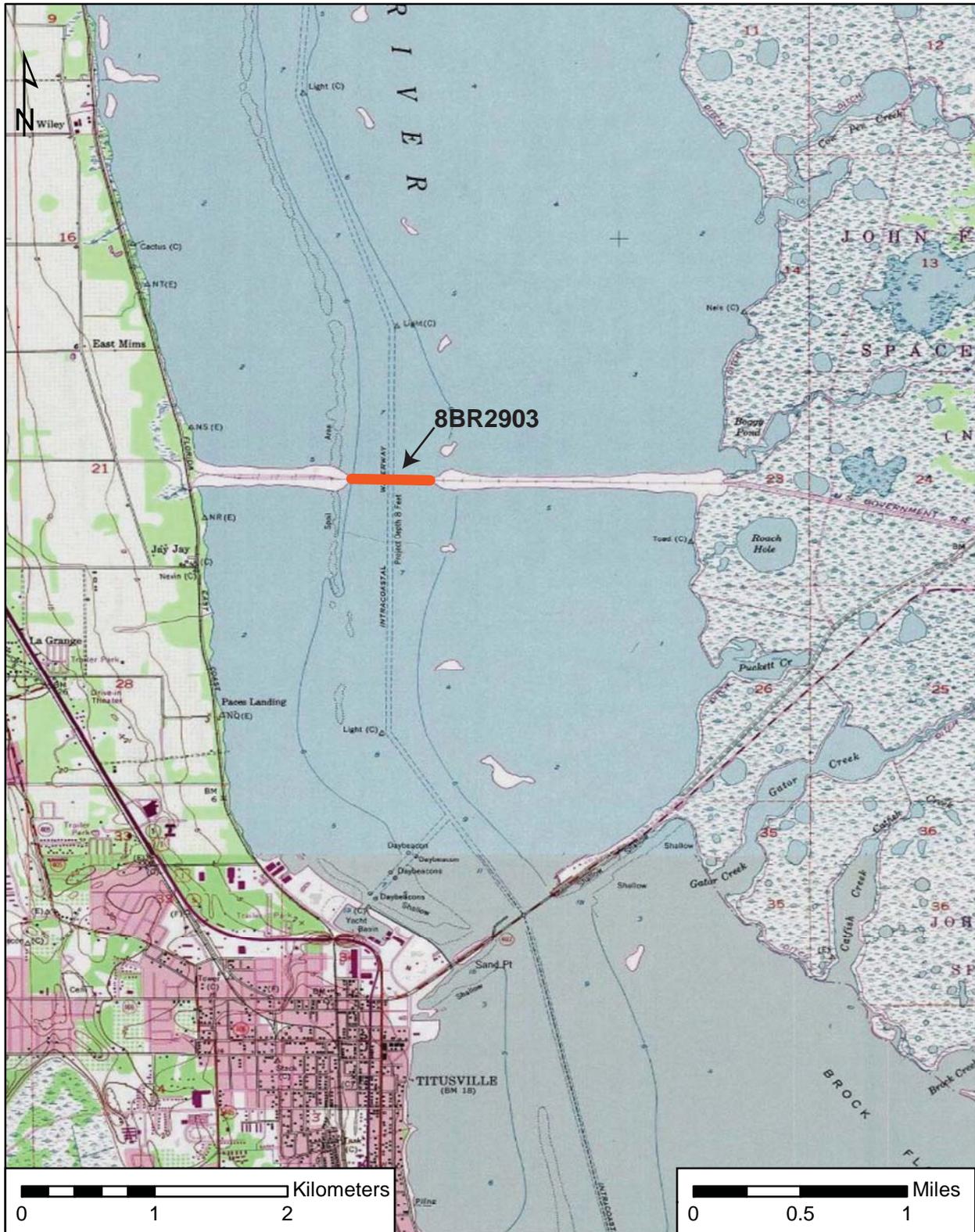


USGS

Mims

Township 21 South, Range 35 East, Section 21

National Geographic Society (2011) USA Topo Maps.



Original
 Update



HISTORICAL STRUCTURE FORM

FLORIDA MASTER SITE FILE

Version 4.0 1/07

Site #8 **BR02923**
Field Date 1-24-2012
Form Date 2-16-2012
Recorder # 18

Shaded Fields represent the minimum acceptable level of documentation.
Consult the *Guide to Historical Structure Forms* for detailed instructions.

Site Name(s) (address if none) Locomotive 1 Multiple Listing (DHR only) _____
Survey Project Name Historic Survey of NASA Railroad System Survey # (DHR only) _____
National Register Category (please check one) building structure district site object
Ownership: private-profit private-nonprofit private-individual private-nonspecific city county state federal Native American foreign unknown

LOCATION & MAPPING

Address: Contractor Street Number _____ Direction _____ Street Name _____ Street Type _____ Suffix Direction _____
Cross Streets (nearest / between) Schwartz Road and Saturn Causeway
USGS 7.5 Map Name ORSINO USGS Date 1976 Plat or Other Map _____
City / Town (within 3 miles) Titusville In City Limits? yes no unknown County Brevard
Township 22S Range 37E Section 19 1/4 section: NW SW SE NE Irregular-name: _____
Tax Parcel # Not applicable Landgrant _____
Subdivision Name _____ Block _____ Lot _____
UTM Coordinates: Zone 16 17 Easting 533794 Northing 3160101
Other Coordinates: X: _____ Y: _____ Coordinate System & Datum _____
Name of Public Tract (e.g., park) _____

HISTORY

Construction Year: 1968 approximately year listed or earlier year listed or later
Original Use Other From (year): 1968 To (year): curr
Current Use Other From (year): _____ To (year): _____
Other Use Locomotive From (year): _____ To (year): _____
Moves: yes no unknown Date: _____ Original address _____
Alterations: yes no unknown Date: _____ Nature See continuation sheet
Additions: yes no unknown Date: _____ Nature _____
Architect (last name first): _____ Builder (last name first): _____
Ownership History (especially original owner, dates, profession, etc.) Toledo, Peoria, and Western Railway, 1968-unknown; NASA, 1984-present
Is the Resource Affected by a Local Preservation Ordinance? yes no unknown Describe _____

DESCRIPTION

Style Not applicable Exterior Plan Not applicable Number of Stories NA
Exterior Fabric(s) 1. Steel 2. _____ 3. _____
Roof Type(s) 1. Vaulted 2. _____ 3. _____
Roof Material(s) 1. Other 2. _____ 3. _____
Roof secondary strucs. (dormers etc.) 1. _____ 2. _____
Windows (types, materials, etc.) _____
Distinguishing Architectural Features (exterior or interior ornaments) _____
Ancillary Features / Outbuildings (record outbuildings, major landscape features; use continuation sheet if needed.) _____

DHR USE ONLY		OFFICIAL EVALUATION		DHR USE ONLY	
NR List Date _____	SHPO – Appears to meet criteria for NR listing: <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> insufficient info	Date _____	Init. _____		
<input type="checkbox"/> Owner Objection	KEEPER – Determined eligible: <input type="checkbox"/> yes <input type="checkbox"/> no	Date _____			
	NR Criteria for Evaluation: <input type="checkbox"/> a <input type="checkbox"/> b <input type="checkbox"/> c <input type="checkbox"/> d (see <i>National Register Bulletin 15</i> , p. 2)				

DESCRIPTION (continued)

Chimney: No. ____ Chimney Material(s): 1. _____ 2. _____
 Structural System(s): 1. _____ 2. _____ 3. _____
 Foundation Type(s): 1. _____ 2. _____
 Foundation Material(s): 1. _____ 2. _____
 Main Entrance (stylistic details) _____

Porch Descriptions (types, locations, roof types, etc.) _____

Condition (overall resource condition): excellent good fair deteriorated ruinous

Narrative Description of Resource See continuation sheet

Archaeological Remains _____ Check if Archaeological Form Completed

RESEARCH METHODS (check all that apply)

FMSF record search (sites/surveys) library research building permits Sanborn maps
 FL State Archives/photo collection city directory occupant/owner interview plat maps
 property appraiser / tax records newspaper files neighbor interview Public Lands Survey (DEP)
 cultural resource survey (CRAS) historic photos interior inspection HABS/HAER record search
 other methods (describe) _____

Bibliographic References (give FMSF manuscript # if relevant, use continuation sheet if needed) See continuation sheet

OPINION OF RESOURCE SIGNIFICANCE

Appears to meet the criteria for National Register listing individually? yes no insufficient information

Appears to meet the criteria for National Register listing as part of a district? yes no insufficient information

Explanation of Evaluation (required, whether significant or not; use separate sheet if needed) See continuation sheet

Area(s) of Historical Significance (see *National Register Bulletin 15*, p. 8 for categories: e.g. "architecture", "ethnic heritage", "community planning & development", etc.)

1. Other 3. _____ 5. _____
 2. Transportation 4. _____ 6. _____

DOCUMENTATION

Accessible Documentation Not Filed with the Site File - including field notes, analysis notes, photos, plans and other important documents

1) Document type All materials at one location Maintaining organization Archaeological Consultants Inc
 Document description _____ File or accession #'s P9026Q
 2) Document type _____ Maintaining organization _____
 Document description _____ File or accession #'s _____

RECORDER INFORMATION

Recorder Name Christopher Berger Affiliation Archaeological Consultants Inc

Recorder Contact Information 8110 Blaikie Court, Suite A, Sarasota, FL 34240/941-379-6206/ACIFlorida@comcast.net
 (address / phone / fax / e-mail)

Required Attachments

- ① USGS 7.5' MAP WITH STRUCTURE LOCATION PINPOINTED IN RED
- ② LARGE SCALE STREET, PLAT OR PARCEL MAP (available from most property appraiser web sites)
- ③ PHOTO OF MAIN FACADE, ARCHIVAL B&W PRINT OR DIGITAL IMAGE FILE

If submitting an image file, it must be included on disk or CD AND in hard copy format (plain paper is acceptable).
 Digital image must be at least 1600 x 1200 pixels, 24-bit color, jpeg or tiff.

CONTINUATION SHEET**Narrative Description**

Locomotive 1 (8BR2923) is one of three switching locomotives within the NASA Kennedy Space Center (KSC) Railroad System; the others are Locomotive 2 (8BR3043) and Locomotive 3 (8BR3044). Locomotive 1 is a model EMD SW1500, built by General Motors' Electro-Motive Division. It is 44'-8"-long and stands 11'-9"-tall at the engine hood and 15' at the top of the cab. It weighs 248,000 tons and sits on two, four-wheel trucks with a 40" wheel diameter. A walkway surrounds the engine and is accessible either from the cab or from the steps at the front. The cab also can be entered through a door at the back. The 1,500 horsepower, V-12 diesel engine is capable of reaching speeds up to 65 mph (Bachand n.d.).

Locomotive 1 was built in February 1968 for the Toledo, Peoria, and Western Railway; it had the number TP&W 303. In all, 808 EMD SW1500 locomotives were built by General Motors (KSC-TO, Folder No. Locomotive 1). NASA bought all three locomotives on July 24, 1984, for \$108,000 each to replace three Alco S2 locomotive switcher cars that had previously belonged to the Army (KSC-TO, Folder No. Locomotive 1; NASA 2007). Locomotive 1 was repainted black, red, and gray with white stripes, and in 2004, the NASA Railroad crew rebuilt its engine (*Spaceport News* 2004).

Locomotive 1, along with Locomotives 2 and 3, moved railcars to and from the Jay Jay Yard and facilities throughout the KSC, as well as to the Center's exchange with the Cape Canaveral Air Force Station. Most notably, the locomotives transported solid rocket booster (SRB) motor case segments, which were used in concert with the space shuttle main engines to launch orbiters into space (*Spaceport News* 2011). They also conveyed Space Shuttle Program (SSP) ground support equipment, the rocket propellant nitrogen tetroxide, Air Force Titan rockets, Navy Trident missiles, and booster segments for the Ares I-X test flights (NASA 2007).

With the retirement of the SSP, Locomotive 1 will be maintained as the backup to Locomotive 3, which will serve as the primary vehicle for the KSC's rail network; Locomotive 2 will be used for parts for the other two (Crews 2012).

Explanation of Evaluation

Locomotive 1 is considered eligible for listing in the National Register of Historic Places as a contributing resource to the NASA KSC Railroad System Historic District (8BR2932), which is eligible in the context of the U.S. Space Shuttle Program (ca. 1969-2011). The locomotive was purchased by NASA in 1984, and was one of three locomotives that were crucial to the NASA Railroad's support of the SSP; everything that entered the KSC from 1984 to 2010 via the railroad was transported by one of these three locomotives. Most prominently, the locomotives were used in tandem with railcars to transport the SRB motor case segments between the Thiokol Corporation, their manufacturer in Utah, and the KSC. Furthermore, the locomotives moved ground support equipment and supplies important to the SSP and its associated activities at the KSC. Locomotive 1 has retained its historical integrity.

CONTINUATION SHEET

Bibliographic References

Bachand, Jean-Denis. EMD SW1500.

n.d. Accessed on February 2, 2012, at <http://thedieselshop.us/Data%20EMD%20SW1500.HTML>.

Crews, Jesse (KSC Railroad technician)

2012 Interview by Christopher Berger, January 25. Notes on file at Archaeological Consultants Inc.

NASA KSC, Transportation Office (KSC-TO)

Var. Folder No. Locomotive 1, 2/68, Formerly TP&W 303

National Aeronautics and Space Administration.

2007 *Facts: The NASA Railroad*.

Spaceport News

2004 "Railroad Crew Gets Locomotive Back on Track." 11 February:8.

2008 "Scene Around Kennedy Space Center." 28 November:5.

2011 "NASA Railroad Played Vital Role in Shuttle Booster Haul." 11 February:6.



PHOTOGRAPHS



Locomotive No. 1



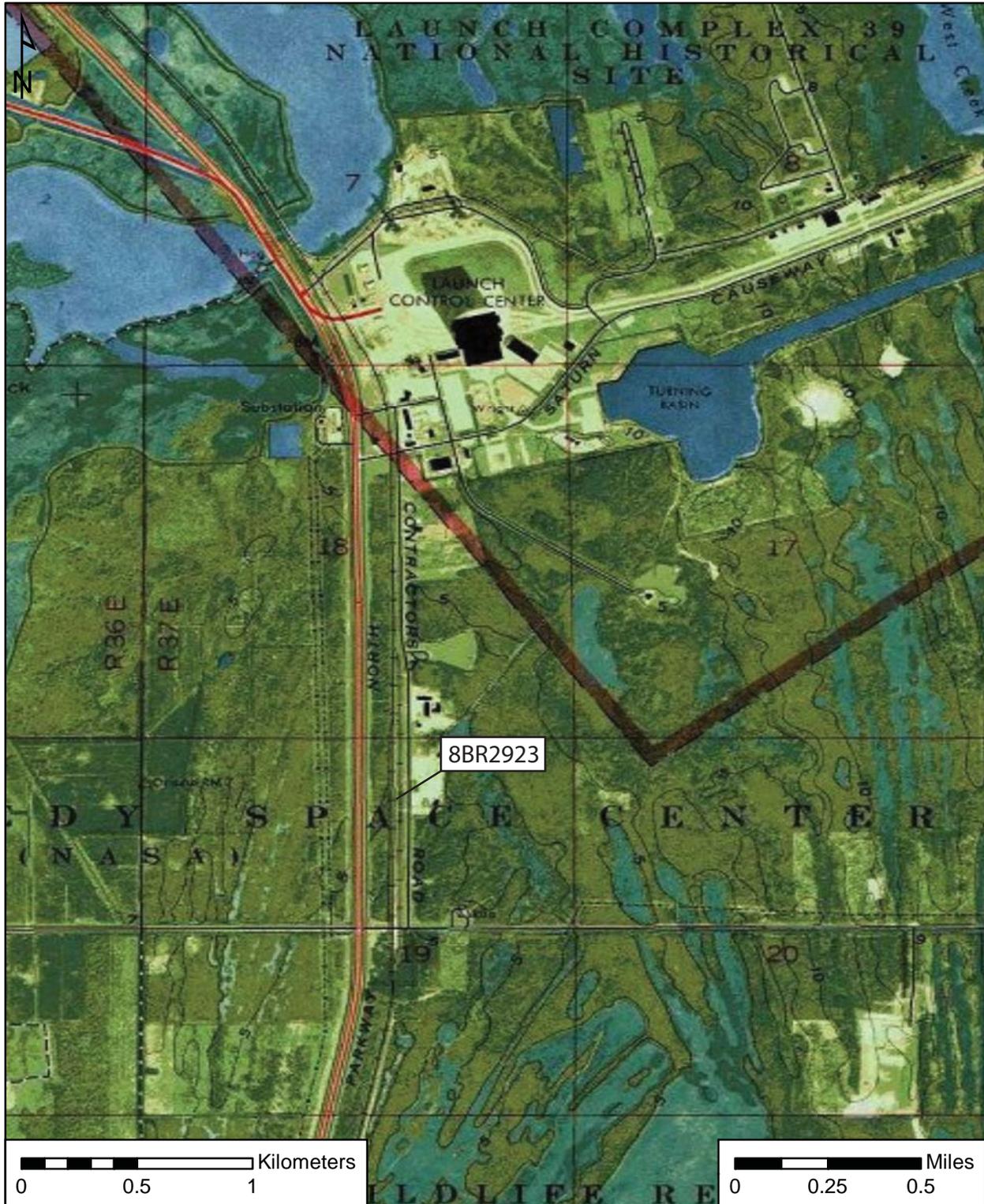
Locomotive No. 1



USGS

Orsino

Township 22 South, Range 37 East, Section 19
National Geographic Society (2011) *USA Topo Maps*.



Original
 Update



HISTORICAL STRUCTURE FORM

FLORIDA MASTER SITE FILE

Version 4.0 1/07

Site #8 **BR03043**
Field Date 1-24-2012
Form Date 11-13-2012
Recorder # 18

Shaded Fields represent the minimum acceptable level of documentation.
Consult the *Guide to Historical Structure Forms* for detailed instructions.

Site Name(s) (address if none) Locomotive 2 Multiple Listing (DHR only) _____
Survey Project Name Historic Survey of NASA Railroad System Survey # (DHR only) _____
National Register Category (please check one) building structure district site object
Ownership: private-profit private-nonprofit private-individual private-nonspecific city county state federal Native American foreign unknown

LOCATION & MAPPING

Address: Contractor Street Number _____ Direction _____ Street Name _____ Street Type Road Suffix Direction _____
Cross Streets (nearest / between) Schwartz Road and Saturn Causeway
USGS 7.5 Map Name ORSINO USGS Date 1976 Plat or Other Map _____
City / Town (within 3 miles) Titusville In City Limits? yes no unknown County Brevard
Township 22S Range 37E Section 19 1/4 section: NW SW SE NE Irregular-name: _____
Tax Parcel # Not applicable Landgrant _____
Subdivision Name _____ Block _____ Lot _____
UTM Coordinates: Zone 16 17 Easting 533794 Northing 3160101
Other Coordinates: X: _____ Y: _____ Coordinate System & Datum _____
Name of Public Tract (e.g., park) _____

HISTORY

Construction Year: 1970 approximately year listed or earlier year listed or later
Original Use Other From (year): 1968 To (year): curr
Current Use Other From (year): _____ To (year): _____
Other Use Locomotive From (year): _____ To (year): _____
Moves: yes no unknown Date: _____ Original address _____
Alterations: yes no unknown Date: _____ Nature See continuation sheet
Additions: yes no unknown Date: _____ Nature _____
Architect (last name first): _____ Builder (last name first): _____
Ownership History (especially original owner, dates, profession, etc.) Toledo, Peoria, and Western Railway, 1968-unknown; NASA, 1984-present
Is the Resource Affected by a Local Preservation Ordinance? yes no unknown Describe _____

DESCRIPTION

Style Not applicable Exterior Plan Not applicable Number of Stories NA
Exterior Fabric(s) 1. Steel 2. _____ 3. _____
Roof Type(s) 1. Vaulted 2. _____ 3. _____
Roof Material(s) 1. Other 2. _____ 3. _____
Roof secondary strucs. (dormers etc.) 1. _____ 2. _____
Windows (types, materials, etc.) _____
Distinguishing Architectural Features (exterior or interior ornaments) _____
Ancillary Features / Outbuildings (record outbuildings, major landscape features; use continuation sheet if needed.) _____

DHR USE ONLY		OFFICIAL EVALUATION		DHR USE ONLY	
NR List Date _____	SHPO – Appears to meet criteria for NR listing: <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> insufficient info	Date _____	Init. _____		
<input type="checkbox"/> Owner Objection	KEEPER – Determined eligible: <input type="checkbox"/> yes <input type="checkbox"/> no	Date _____			
	NR Criteria for Evaluation: <input type="checkbox"/> a <input type="checkbox"/> b <input type="checkbox"/> c <input type="checkbox"/> d (see <i>National Register Bulletin 15</i> , p. 2)				

DESCRIPTION (continued)

Chimney: No. ____ Chimney Material(s): 1. _____ 2. _____
 Structural System(s): 1. _____ 2. _____ 3. _____
 Foundation Type(s): 1. _____ 2. _____
 Foundation Material(s): 1. _____ 2. _____
 Main Entrance (stylistic details) _____

Porch Descriptions (types, locations, roof types, etc.) _____

Condition (overall resource condition): excellent good fair deteriorated ruinous

Narrative Description of Resource See continuation sheet

Archaeological Remains _____ Check if Archaeological Form Completed

RESEARCH METHODS (check all that apply)

FMSF record search (sites/surveys) library research building permits Sanborn maps
 FL State Archives/photo collection city directory occupant/owner interview plat maps
 property appraiser / tax records newspaper files neighbor interview Public Lands Survey (DEP)
 cultural resource survey (CRAS) historic photos interior inspection HABS/HAER record search
 other methods (describe) _____

Bibliographic References (give FMSF manuscript # if relevant, use continuation sheet if needed) See continuation sheet

OPINION OF RESOURCE SIGNIFICANCE

Appears to meet the criteria for National Register listing individually? yes no insufficient information

Appears to meet the criteria for National Register listing as part of a district? yes no insufficient information

Explanation of Evaluation (required, whether significant or not; use separate sheet if needed) See continuation sheet

Area(s) of Historical Significance (see *National Register Bulletin 15*, p. 8 for categories: e.g. "architecture", "ethnic heritage", "community planning & development", etc.)

1. Other 3. _____ 5. _____
 2. Transportation 4. _____ 6. _____

DOCUMENTATION

Accessible Documentation Not Filed with the Site File - including field notes, analysis notes, photos, plans and other important documents

- 1) Document type All materials at one location Maintaining organization Archaeological Consultants Inc
 Document description _____ File or accession #'s P9026Q
- 2) Document type _____ Maintaining organization _____
 Document description _____ File or accession #'s _____

RECORDER INFORMATION

Recorder Name Trish Slovinac Affiliation Archaeological Consultants Inc

Recorder Contact Information 8110 Blaikie Court, Suite A, Sarasota, FL 34240/941-379-6206/ACIFlorida@comcast.net
 (address / phone / fax / e-mail)

Required Attachments

- ① USGS 7.5' MAP WITH STRUCTURE LOCATION PINPOINTED IN RED
- ② LARGE SCALE STREET, PLAT OR PARCEL MAP (available from most property appraiser web sites)
- ③ PHOTO OF MAIN FACADE, ARCHIVAL B&W PRINT OR DIGITAL IMAGE FILE

If submitting an image file, it must be included on disk or CD AND in hard copy format (plain paper is acceptable).
 Digital image must be at least 1600 x 1200 pixels, 24-bit color, jpeg or tiff.

CONTINUATION SHEET**Narrative Description**

Locomotive 2 (8BR3043) is one of three switching locomotives within the NASA Kennedy Space Center (KSC) Railroad System; the others are Locomotive 1 (8BR2923) and Locomotive 3 (8BR3044). Locomotive 2 is a model EMD SW1500, built by General Motors' Electro-Motive Division. It is 44'-8"-long and stands 11'-9"-tall at the engine hood and 15' at the top of the cab. It weighs 248,000 tons and sits on two, four-wheel trucks with a 40" wheel diameter. A walkway surrounds the engine and is accessible either from the cab or from the steps at the front. The cab also can be entered through a door at the back. The 1,500 horsepower, V-12 diesel engine is capable of reaching speeds up to 65 mph (Bachand n.d.).

Locomotive 2 was built in 1970 for the Toledo, Peoria, and Western Railway; it had the number TP&W 305. In all, 808 EMD SW1500 locomotives were built by General Motors (KSC-TO, Folder No. Locomotive 1). NASA bought the three locomotives on July 24, 1984, for \$108,000 each to replace three Alco S2 locomotive switcher cars that had previously belonged to the Army (KSC-TO, Folder No. Locomotive 1; NASA 2007). Locomotive 2 was repainted black, red, and gray with white stripes.

Locomotive 2, along with Locomotives 1 and 3, moved railcars to and from the Jay Jay Yard and facilities throughout the KSC, as well as to the Center's exchange with the Cape Canaveral Air Force Station. Most notably, the locomotives transported solid rocket booster (SRB) motor case segments, which were used in concert with the space shuttle main engines to launch orbiters into space (*Spaceport News* 2011). They also conveyed Space Shuttle Program (SSP) ground support equipment, the rocket propellant nitrogen tetroxide, Air Force Titan rockets, Navy Trident missiles, and booster segments for the Ares I-X test flights (NASA 2007).

With the retirement of the SSP, Locomotive 2 will be used for parts for the other two locomotives. Locomotive 3 will serve as the primary vehicle for the KSC's rail network, while Locomotive 1 will be maintained as the backup (Crews 2012).

Explanation of Evaluation

Locomotive 2 is considered eligible for listing in the National Register of Historic Places as a contributing resource to the NASA KSC Railroad System Historic District (8BR2932), which is eligible in the context of the U.S. Space Shuttle Program (ca. 1969-2011). The locomotive was purchased by NASA in 1984, and was one of three locomotives that were crucial to the NASA Railroad's support of the SSP; everything that entered the KSC from 1984 to 2010 via the railroad was transported by one of these three locomotives. Most prominently, the locomotives were used in tandem with railcars to transport the SRB motor case segments between the Thiokol Corporation, their manufacturer in Utah, and the KSC. Furthermore, the locomotives moved ground support equipment and supplies important to the SSP and its associated activities at the KSC. Locomotive 2 has retained its historical integrity.

CONTINUATION SHEET

Bibliographic References

Bachand, Jean-Denis. EMD SW1500.

n.d. Accessed on February 2, 2012, at <http://thedieselshop.us/Data%20EMD%20SW1500.HTML>.

Crews, Jesse (KSC Railroad technician)

2012 Interview by Christopher Berger, January 25. Notes on file at Archaeological Consultants Inc.

NASA KSC, Transportation Office (KSC-TO)

Var. Folder No. Locomotive 1, 2/68, Formerly TP&W 303

National Aeronautics and Space Administration.

2007 *Facts: The NASA Railroad*.

Spaceport News

2008 "Scene Around Kennedy Space Center." 28 November:5.

2011 "NASA Railroad Played Vital Role in Shuttle Booster Haul." 11 February:6.



PHOTOGRAPHS



Locomotive No.2



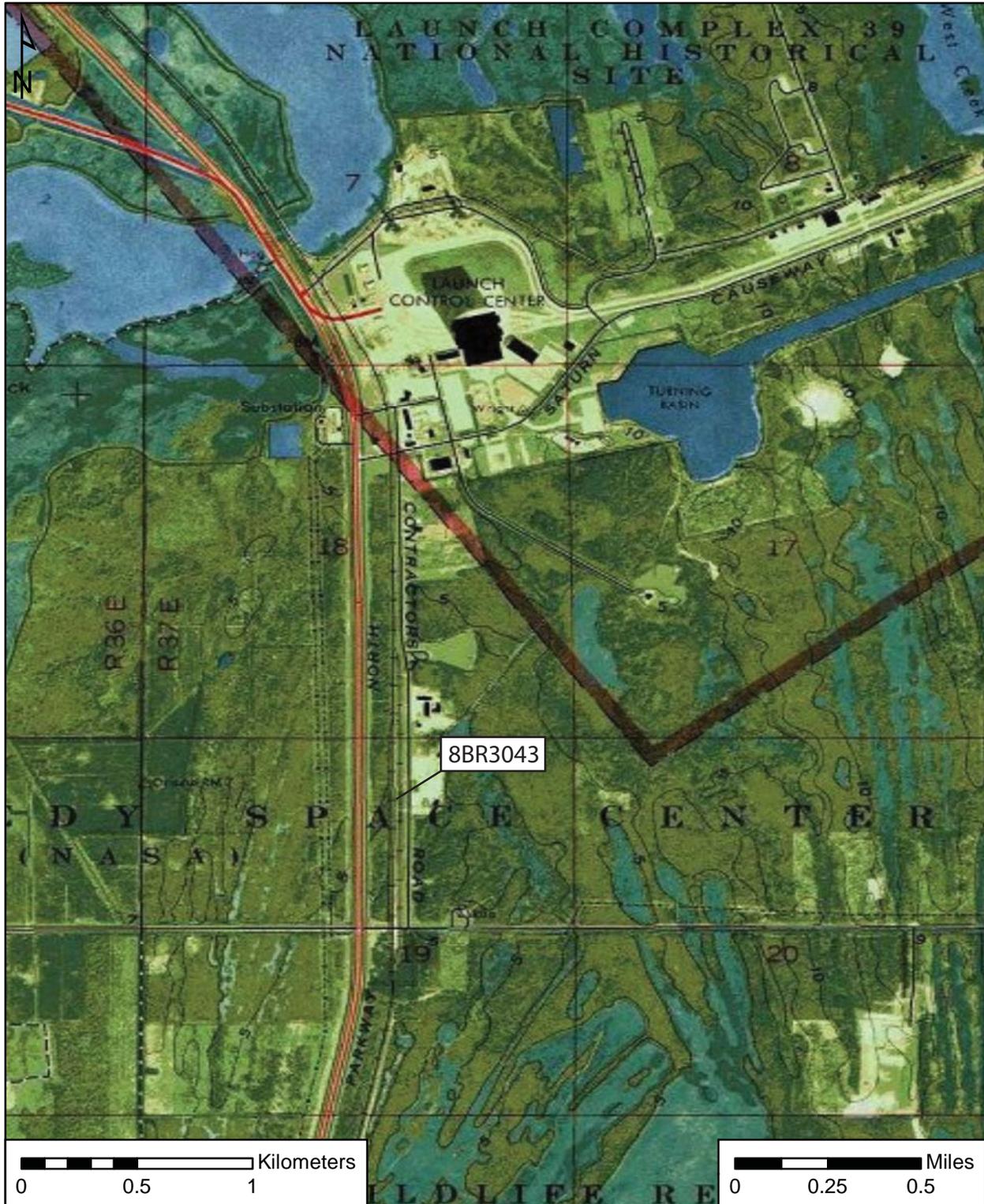
Locomotive No.2



USGS

Orsino

Township 22 South, Range 37 East, Section 19
National Geographic Society (2011) USA Topo Maps.



Original
 Update



HISTORICAL STRUCTURE FORM

FLORIDA MASTER SITE FILE

Version 4.0 1/07

Site #8 **BR03044**
Field Date 1-24-2012
Form Date 11-13-2012
Recorder # 18

Shaded Fields represent the minimum acceptable level of documentation.
Consult the *Guide to Historical Structure Forms* for detailed instructions.

Site Name(s) (address if none) Locomotive 3 Multiple Listing (DHR only) _____
Survey Project Name Historic Survey of NASA Railroad System Survey # (DHR only) _____
National Register Category (please check one) building structure district site object
Ownership: private-profit private-nonprofit private-individual private-nonspecific city county state federal Native American foreign unknown

LOCATION & MAPPING

Address: Contractor Street Number _____ Direction _____ Street Name _____ Street Type Road Suffix Direction _____
Cross Streets (nearest / between) Schwartz Road and Saturn Causeway
USGS 7.5 Map Name ORSINO USGS Date 1976 Plat or Other Map _____
City / Town (within 3 miles) Titusville In City Limits? yes no unknown County Brevard
Township 22S Range 37E Section 19 1/4 section: NW SW SE NE Irregular-name: _____
Tax Parcel # Not applicable Landgrant _____
Subdivision Name _____ Block _____ Lot _____
UTM Coordinates: Zone 16 17 Easting 533794 Northing 3160101
Other Coordinates: X: _____ Y: _____ Coordinate System & Datum _____
Name of Public Tract (e.g., park) _____

HISTORY

Construction Year: 1970 approximately year listed or earlier year listed or later
Original Use Other From (year): 1968 To (year): curr
Current Use Other From (year): _____ To (year): _____
Other Use Locomotive From (year): _____ To (year): _____
Moves: yes no unknown Date: _____ Original address _____
Alterations: yes no unknown Date: _____ Nature See continuation sheet
Additions: yes no unknown Date: _____ Nature _____
Architect (last name first): _____ Builder (last name first): _____
Ownership History (especially original owner, dates, profession, etc.) Toledo, Peoria, and Western Railway, 1968-unknown; NASA, 1984-present
Is the Resource Affected by a Local Preservation Ordinance? yes no unknown Describe _____

DESCRIPTION

Style Not applicable Exterior Plan Not applicable Number of Stories NA
Exterior Fabric(s) 1. Steel 2. _____ 3. _____
Roof Type(s) 1. Vaulted 2. _____ 3. _____
Roof Material(s) 1. Other 2. _____ 3. _____
Roof secondary strucs. (dormers etc.) 1. _____ 2. _____
Windows (types, materials, etc.) _____
Distinguishing Architectural Features (exterior or interior ornaments) _____
Ancillary Features / Outbuildings (record outbuildings, major landscape features; use continuation sheet if needed.) _____

DHR USE ONLY		OFFICIAL EVALUATION		DHR USE ONLY	
NR List Date _____	SHPO – Appears to meet criteria for NR listing: <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> insufficient info	Date _____	Init. _____		
<input type="checkbox"/> Owner Objection	KEEPER – Determined eligible: <input type="checkbox"/> yes <input type="checkbox"/> no	Date _____			
	NR Criteria for Evaluation: <input type="checkbox"/> a <input type="checkbox"/> b <input type="checkbox"/> c <input type="checkbox"/> d (see <i>National Register Bulletin 15</i> , p. 2)				

DESCRIPTION (continued)

Chimney: No. ____ Chimney Material(s): 1. _____ 2. _____
 Structural System(s): 1. _____ 2. _____ 3. _____
 Foundation Type(s): 1. _____ 2. _____
 Foundation Material(s): 1. _____ 2. _____
 Main Entrance (stylistic details) _____

Porch Descriptions (types, locations, roof types, etc.) _____

Condition (overall resource condition): excellent good fair deteriorated ruinous

Narrative Description of Resource See continuation sheet

Archaeological Remains _____ Check if Archaeological Form Completed

RESEARCH METHODS (check all that apply)

FMSF record search (sites/surveys) library research building permits Sanborn maps
 FL State Archives/photo collection city directory occupant/owner interview plat maps
 property appraiser / tax records newspaper files neighbor interview Public Lands Survey (DEP)
 cultural resource survey (CRAS) historic photos interior inspection HABS/HAER record search
 other methods (describe) _____

Bibliographic References (give FMSF manuscript # if relevant, use continuation sheet if needed) See continuation sheet

OPINION OF RESOURCE SIGNIFICANCE

Appears to meet the criteria for National Register listing individually? yes no insufficient information

Appears to meet the criteria for National Register listing as part of a district? yes no insufficient information

Explanation of Evaluation (required, whether significant or not; use separate sheet if needed) See continuation sheet

Area(s) of Historical Significance (see *National Register Bulletin 15*, p. 8 for categories: e.g. "architecture", "ethnic heritage", "community planning & development", etc.)

1. Other 3. _____ 5. _____
 2. Transportation 4. _____ 6. _____

DOCUMENTATION

Accessible Documentation Not Filed with the Site File - including field notes, analysis notes, photos, plans and other important documents

- 1) Document type All materials at one location Maintaining organization Archaeological Consultants Inc
 Document description _____ File or accession #'s P9026Q
- 2) Document type _____ Maintaining organization _____
 Document description _____ File or accession #'s _____

RECORDER INFORMATION

Recorder Name Trish Slovinac Affiliation Archaeological Consultants Inc

Recorder Contact Information 8110 Blaikie Court, Suite A, Sarasota, FL 34240/941-379-6206/ACIFlorida@comcast.net
 (address / phone / fax / e-mail)

Required Attachments

- ① USGS 7.5' MAP WITH STRUCTURE LOCATION PINPOINTED IN RED
- ② LARGE SCALE STREET, PLAT OR PARCEL MAP (available from most property appraiser web sites)
- ③ PHOTO OF MAIN FACADE, ARCHIVAL B&W PRINT OR DIGITAL IMAGE FILE

If submitting an image file, it must be included on disk or CD AND in hard copy format (plain paper is acceptable).
 Digital image must be at least 1600 x 1200 pixels, 24-bit color, jpeg or tiff.

CONTINUATION SHEET**Narrative Description**

Locomotive 3 (8BR3044) is one of three switching locomotives within the NASA Kennedy Space Center (KSC) Railroad System; the others are Locomotive 1 (8BR2923) and Locomotive 2 (8BR3043). Locomotive 3 is a model EMD SW1500, built by General Motors' Electro-Motive Division. It is 44'-8"-long and stands 11'-9"-tall at the engine hood and 15' at the top of the cab. It weighs 248,000 tons and sits on two, four-wheel trucks with a 40" wheel diameter. A walkway surrounds the engine and is accessible either from the cab or from the steps at the front. The cab also can be entered through a door at the back. The 1,500 horsepower, V-12 diesel engine is capable of reaching speeds up to 65 mph (Bachand n.d.).

Locomotive 3 was built in 1970 for the Toledo, Peoria, and Western Railway; it had the number TP&W 306. In all, 808 EMD SW1500 locomotives were built by General Motors (KSC-TO, Folder No. Locomotive 1). NASA bought the three locomotives on July 24, 1984, for \$108,000 each to replace three Alco S2 locomotive switcher cars that had previously belonged to the Army (KSC-TO, Folder No. Locomotive 1; NASA 2007). Locomotive 3 was once painted black, red, and gray with white stripes like Locomotives 1 and 2, but is now black, blue, and white with red stripes as a result of a 15-month corrosion repair project completed in 2008 (*Spaceport News* 2008).

Locomotive 3, along with Locomotives 1 and 2, moved railcars to and from the Jay Jay Yard and facilities throughout the KSC, as well as to the Center's exchange with the Cape Canaveral Air Force Station. Most notably, the locomotives transported solid rocket booster (SRB) motor case segments, which were used in concert with the space shuttle main engines to launch orbiters into space (*Spaceport News* 2011). They also conveyed Space Shuttle Program (SSP) ground support equipment, the rocket propellant nitrogen tetroxide, Air Force Titan rockets, Navy Trident missiles, and booster segments for the Ares I-X test flights (NASA 2007).

With the retirement of the SSP, Locomotive 3 will serve as the primary vehicle for the KSC's rail network, while Locomotive 1 will be maintained as its backup. Locomotive 2 will be used for parts for the other two (Crews 2012).

Explanation of Evaluation

Locomotive 3 is considered eligible for listing in the National Register of Historic Places as a contributing resource to the NASA KSC Railroad System Historic District (8BR2932), which is eligible in the context of the U.S. Space Shuttle Program (ca. 1969-2011). The locomotive was purchased by NASA in 1984, and was one of three locomotives that were crucial to the NASA Railroad's support of the SSP; everything that entered the KSC from 1984 to 2010 via the railroad was transported by one of these three locomotives. Most prominently, the locomotives were used in tandem with railcars to transport the SRB motor case segments between the Thiokol Corporation, their manufacturer in Utah, and the KSC. Furthermore, the locomotives moved ground support equipment and supplies important to the SSP and its associated activities at the KSC. While Locomotive 3 has been repainted in a new design scheme, it continues to retain its historical integrity.

CONTINUATION SHEET

Bibliographic References

Bachand, Jean-Denis. EMD SW1500.

n.d. Accessed on February 2, 2012, at <http://thedieselshop.us/Data%20EMD%20SW1500.HTML>.

Crews, Jesse (KSC Railroad technician)

2012 Interview by Christopher Berger, January 25. Notes on file at Archaeological Consultants Inc.

NASA KSC, Transportation Office (KSC-TO)

Var. Folder No. Locomotive 1, 2/68, Formerly TP&W 303

National Aeronautics and Space Administration.

2007 *Facts: The NASA Railroad*.

Spaceport News

2008 "Scene Around Kennedy Space Center." 28 November:5.

2011 "NASA Railroad Played Vital Role in Shuttle Booster Haul." 11 February:6.



PHOTOGRAPHS



Locomotive No.3

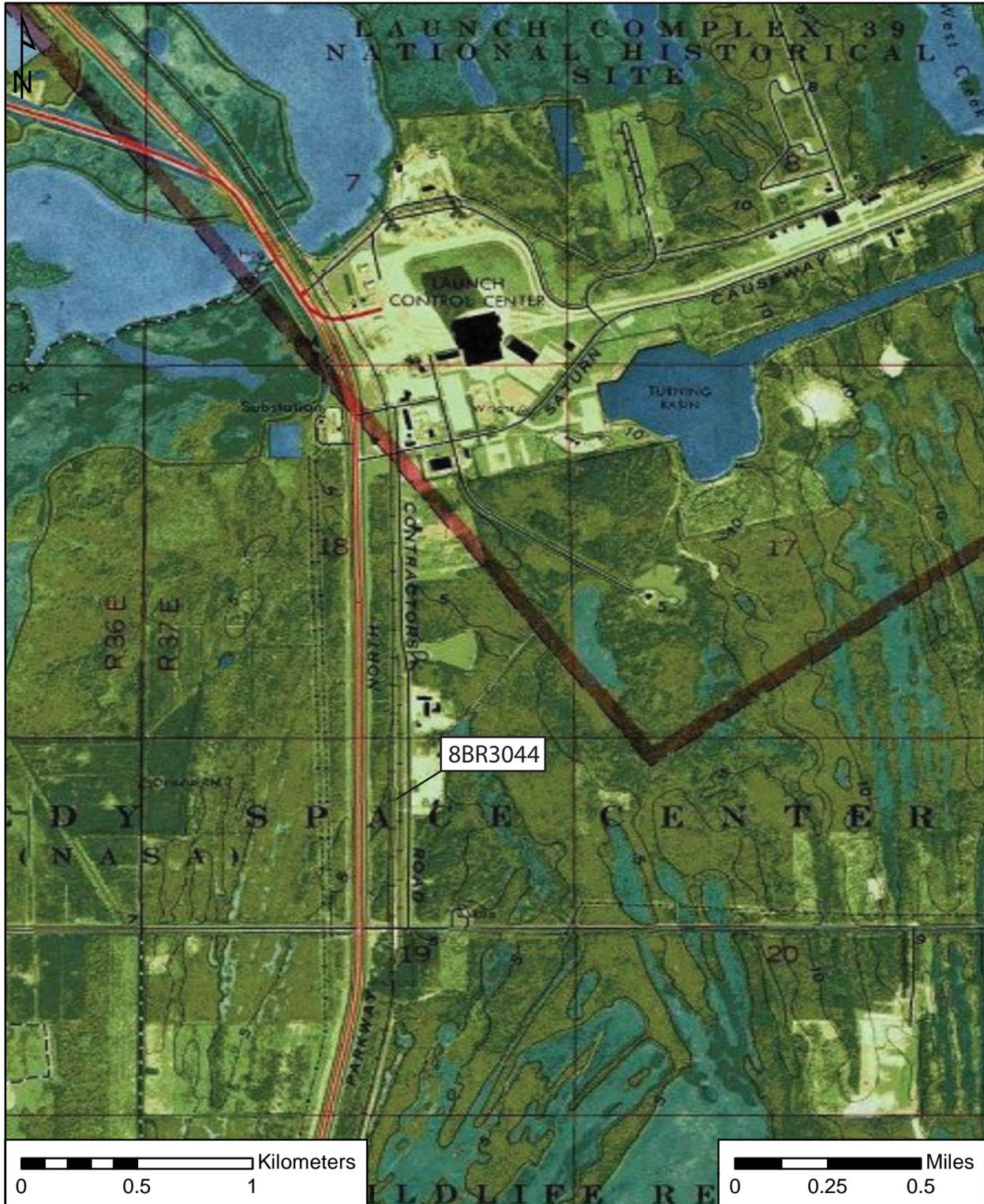




USGS

Orsino

Township 22 South, Range 37 East, Section 19
National Geographic Society (2011) *USA Topo Maps*.



Original
 Update



HISTORICAL STRUCTURE FORM

FLORIDA MASTER SITE FILE

Version 4.0 1/07

Site #8 **BR02907**
Field Date 1-24-2012
Form Date 1-25-2012
Recorder # 1

Shaded Fields represent the minimum acceptable level of documentation.
Consult the *Guide to Historical Structure Forms* for detailed instructions.

Site Name(s) (address if none) NLAX 40; NLAX 41 Multiple Listing (DHR only) _____
Survey Project Name Historic Survey of NASA Railroad System Survey # (DHR only) _____
National Register Category (please check one) building structure district site object
Ownership: private-profit private-nonprofit private-individual private-nonspecific city county state federal Native American foreign unknown

LOCATION & MAPPING

Address: Contractor Street Number _____ Direction _____ Street Name _____ Street Type Road Suffix Direction _____
Cross Streets (nearest / between) Schwartz Road and Saturn Causeway
USGS 7.5 Map Name ORSINO USGS Date 1976 Plat or Other Map _____
City / Town (within 3 miles) Titusville In City Limits? yes no unknown County Brevard
Township 22S Range 37E Section 19 ¼ section: NW SW SE NE Irregular-name: _____
Tax Parcel # Not applicable Landgrant _____
Subdivision Name _____ Block _____ Lot _____
UTM Coordinates: Zone 16 17 Easting 533794 Northing 3160101
Other Coordinates: X: _____ Y: _____ Coordinate System & Datum _____
Name of Public Tract (e.g., park) _____

HISTORY

Construction Year: 1952 approximately year listed or earlier year listed or later
Original Use Other From (year): 1952 To (year): curr
Current Use Other From (year): _____ To (year): _____
Other Use Railcar From (year): _____ To (year): _____
Moves: yes no unknown Date: _____ Original address _____
Alterations: yes no unknown Date: 9-1-1995 Nature Converted from tank car to 70 ton spacer
Additions: yes no unknown Date: _____ Nature _____
Architect (last name first): _____ Builder (last name first): Unknown
Ownership History (especially original owner, dates, profession, etc.) Department of Defense circa 1952-1982; NASA-1982 to present

Is the Resource Affected by a Local Preservation Ordinance? yes no unknown Describe _____

DESCRIPTION

Style Not applicable Exterior Plan Not applicable Number of Stories NA
Exterior Fabric(s) 1. Steel 2. _____ 3. _____
Roof Type(s) 1. _____ 2. _____ 3. _____
Roof Material(s) 1. _____ 2. _____ 3. _____
Roof secondary strucs. (dormers etc.) 1. _____ 2. _____
Windows (types, materials, etc.) _____

Distinguishing Architectural Features (exterior or interior ornaments) _____

Ancillary Features / Outbuildings (record outbuildings, major landscape features; use continuation sheet if needed.) _____

DHR USE ONLY		OFFICIAL EVALUATION		DHR USE ONLY	
NR List Date _____	SHPO – Appears to meet criteria for NR listing: <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> insufficient info	Date _____	Init. _____		
<input type="checkbox"/> Owner Objection	KEEPER – Determined eligible: <input type="checkbox"/> yes <input type="checkbox"/> no	Date _____			
	NR Criteria for Evaluation: <input type="checkbox"/> a <input type="checkbox"/> b <input type="checkbox"/> c <input type="checkbox"/> d (see <i>National Register Bulletin 15</i> , p. 2)				

DESCRIPTION (continued)

Chimney: No. ___ Chimney Material(s): 1. ___ 2. ___
Structural System(s): 1. ___ 2. ___ 3. ___
Foundation Type(s): 1. ___ 2. ___
Foundation Material(s): 1. ___ 2. ___
Main Entrance (stylistic details) _____

Porch Descriptions (types, locations, roof types, etc.) _____

Condition (overall resource condition): [] excellent [x] good [] fair [] deteriorated [] ruinous
Narrative Description of Resource See continuation sheet

Archaeological Remains _____ [] Check if Archaeological Form Completed

RESEARCH METHODS (check all that apply)

- [x] FMSF record search (sites/surveys) [x] library research [] building permits [] Sanborn maps
[] FL State Archives/photo collection [] city directory [x] occupant/owner interview [] plat maps
[] property appraiser / tax records [x] newspaper files [] neighbor interview [] Public Lands Survey (DEP)
[] cultural resource survey (CRAS) [x] historic photos [x] interior inspection [] HABS/HAER record search
[] other methods (describe) _____

Bibliographic References (give FMSF manuscript # if relevant, use continuation sheet if needed) See continuation sheet

OPINION OF RESOURCE SIGNIFICANCE

Appears to meet the criteria for National Register listing individually? [] yes [x] no [] insufficient information
Appears to meet the criteria for National Register listing as part of a district? [] yes [x] no [] insufficient information

Explanation of Evaluation (required, whether significant or not; use separate sheet if needed) Although NASA owns these railcars, they were not a significant contributor to any U.S. manned space program; therefore, they are not considered individually eligible for the NRHP, nor are they considered contributing to the NASA KSC Railroad HD.

Area(s) of Historical Significance (see National Register Bulletin 15, p. 8 for categories: e.g. "architecture", "ethnic heritage", "community planning & development", etc.)
1. Other 3. 5.
2. Transportation 4. 6.

DOCUMENTATION

Accessible Documentation Not Filed with the Site File - including field notes, analysis notes, photos, plans and other important documents
1) Document type All materials at one location Maintaining organization Archaeological Consultants Inc
Document description File or accession #'s P9026Q
2) Document type Maintaining organization
Document description File or accession #'s

RECORDER INFORMATION

Recorder Name Christopher Berger Affiliation Archaeological Consultants Inc
Recorder Contact Information 8110 Blaikie Court, Suite A, Sarasota, FL 34240/941-379-6206/ACIFlorida@comcast.net
(address / phone / fax / e-mail)

Required Attachments
1 USGS 7.5' MAP WITH STRUCTURE LOCATION PINPOINTED IN RED
2 LARGE SCALE STREET, PLAT OR PARCEL MAP (available from most property appraiser web sites)
3 PHOTO OF MAIN FACADE, ARCHIVAL B&W PRINT OR DIGITAL IMAGE FILE
If submitting an image file, it must be included on disk or CD AND in hard copy format (plain paper is acceptable). Digital image must be at least 1600 x 1200 pixels, 24-bit color, jpeg or tiff.

CONTINUATION SHEET**Narrative Description:**

NLAX 40 and NLAX 41 are both 70-ton flat spacer railroad cars within the NASA Kennedy Space Center Railroad System. The steel cars are both 44'6" long and rest on four axles. They are painted blue with white lettering and include hand rails near the ends.

Both NLAX 40 (formerly DODX 11870) and NLAX 41 (formerly DODX 12165) originated as Department of Defense tank cars. Records indicate DODX 12165 was a 103-W tank car built in 1952 for the government for \$6,300. Both railcars were leased to NASA for about 15 years and used to transport and store isoprophyl alcohol. They were transferred to NASA for \$9,000 each on September 7, 1982, and at that time, DODX 11870 became NLAX 185, and DODX 12165 became NLAX 186. NLAX 186 was upgraded in 1982, and may have used to transport solvents, while NLAX 185 was used to store isoprophyl alcohol. In September 1995, both cars were converted into 70-ton flat spacer cars. NLAX 185 then became NLAX 40, and NLAX 186 became NLAX 41 (KSC-TO, Folder No. 6670-5-040 and KSC-TO, Folder No. 6670-5-044).

Bibliographic References:

NASA KSC, Transportation Office (KSC-TO)

- Var. Folder No. 6670-5-040: Spacer Car 40; 44'6" Long Built 9/95 from NLAX 185 Tank Car Frame (Ex DODX 11870)
- Var. Folder No. 6670-5-041: Spacer Car 41; 44'6" Long Built 9/95 from NLAX 186 Tank Car Frame (Ex DODX 12165)



PHOTOGRAPHS



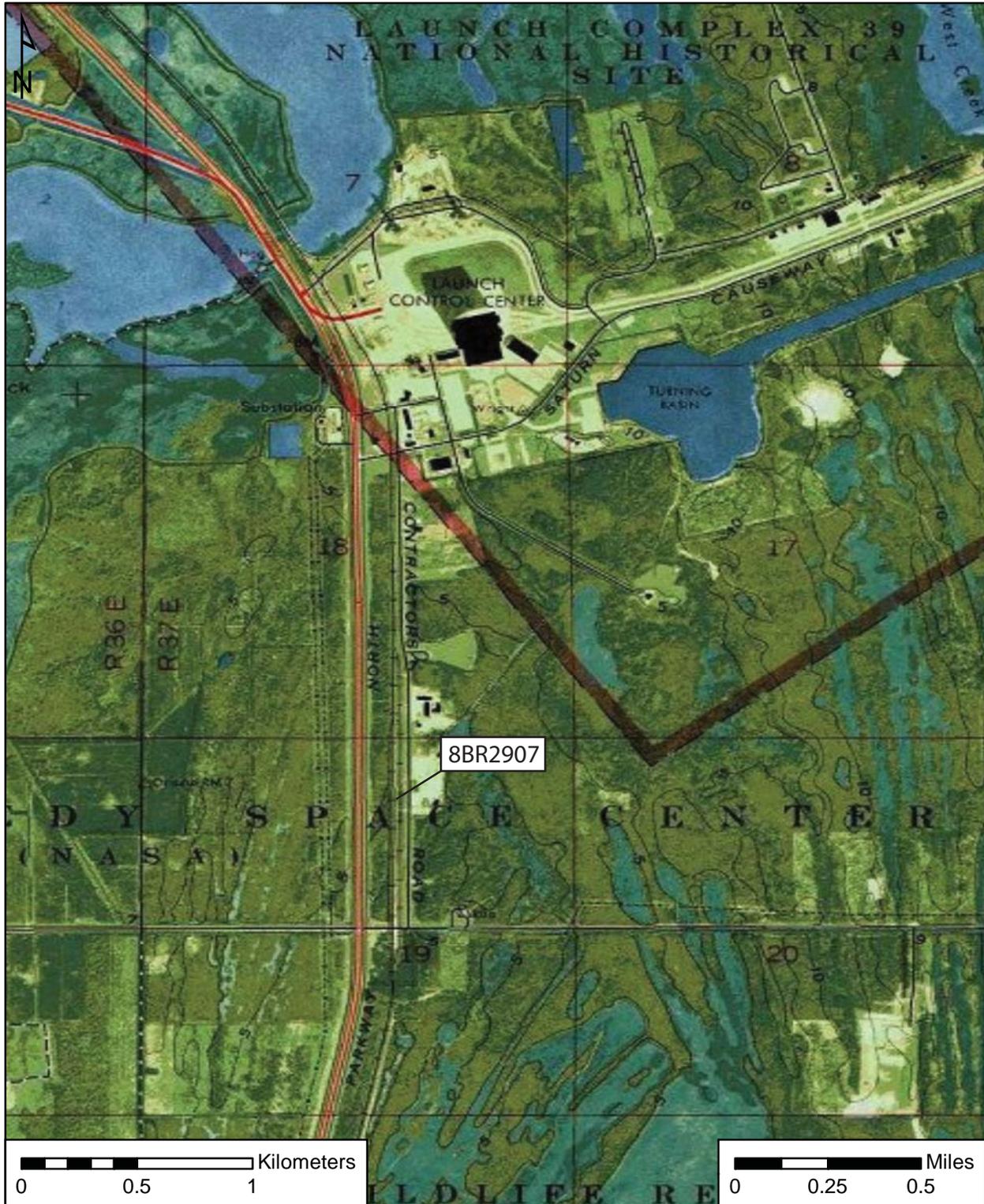
NLAX 41, 70-Ton Flat Spacer



USGS

Orsino

Township 22 South, Range 37 East, Section 19
National Geographic Society (2011) USA Topo Maps.



Original
 Update



HISTORICAL STRUCTURE FORM

FLORIDA MASTER SITE FILE

Version 4.0 1/07

Site #8 **BR02908**
Field Date 1-24-2012
Form Date 2-8-2012
Recorder # 2

Shaded Fields represent the minimum acceptable level of documentation.
Consult the *Guide to Historical Structure Forms* for detailed instructions.

Site Name(s) (address if none) NLAX 170 Multiple Listing (DHR only) _____
Survey Project Name Historic Survey of NASA Railroad System Survey # (DHR only) _____
National Register Category (please check one) building structure district site object
Ownership: private-profit private-nonprofit private-individual private-nonspecific city county state federal Native American foreign unknown

LOCATION & MAPPING

Address: Contractor Street Number _____ Direction _____ Street Name _____ Street Type _____ Suffix Direction _____
Cross Streets (nearest / between) Schwartz Road and Saturn Causeway
USGS 7.5 Map Name ORSINO USGS Date 1976 Plat or Other Map _____
City / Town (within 3 miles) Titusville In City Limits? yes no unknown County Brevard
Township 22S Range 37E Section 19 ¼ section: NW SW SE NE Irregular-name: _____
Tax Parcel # _____ Landgrant _____
Subdivision Name _____ Block _____ Lot _____
UTM Coordinates: Zone 16 17 Easting 533794 Northing 3160101
Other Coordinates: X: _____ Y: _____ Coordinate System & Datum _____
Name of Public Tract (e.g., park) _____

HISTORY

Construction Year: 1985 approximately year listed or earlier year listed or later
Original Use Other From (year): _____ To (year): _____
Current Use Other From (year): _____ To (year): _____
Other Use Railcar From (year): _____ To (year): _____
Moves: yes no unknown Date: _____ Original address _____
Alterations: yes no unknown Date: _____ Nature _____
Additions: yes no unknown Date: _____ Nature _____
Architect (last name first): _____ Builder (last name first): Davidson-Kennedy
Ownership History (especially original owner, dates, profession, etc.) NASA, 1985-present

Is the Resource Affected by a Local Preservation Ordinance? yes no unknown Describe _____

DESCRIPTION

Style Not applicable Exterior Plan Not applicable Number of Stories NA
Exterior Fabric(s) 1. Steel 2. _____ 3. _____
Roof Type(s) 1. _____ 2. _____ 3. _____
Roof Material(s) 1. _____ 2. _____ 3. _____
Roof secondary strucs. (dormers etc.) 1. _____ 2. _____
Windows (types, materials, etc.) _____

Distinguishing Architectural Features (exterior or interior ornaments) _____

Ancillary Features / Outbuildings (record outbuildings, major landscape features; use continuation sheet if needed.) _____

DHR USE ONLY		OFFICIAL EVALUATION		DHR USE ONLY	
NR List Date _____	SHPO – Appears to meet criteria for NR listing: <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> insufficient info	Date _____	Init. _____		
<input type="checkbox"/> Owner Objection	KEEPER – Determined eligible: <input type="checkbox"/> yes <input type="checkbox"/> no	Date _____			
	NR Criteria for Evaluation: <input type="checkbox"/> a <input type="checkbox"/> b <input type="checkbox"/> c <input type="checkbox"/> d (see <i>National Register Bulletin 15</i> , p. 2)				

DESCRIPTION (continued)

Chimney: No. ____ Chimney Material(s): 1. _____ 2. _____
 Structural System(s): 1. _____ 2. _____ 3. _____
 Foundation Type(s): 1. _____ 2. _____
 Foundation Material(s): 1. _____ 2. _____
 Main Entrance (stylistic details) _____

Porch Descriptions (types, locations, roof types, etc.) _____

Condition (overall resource condition): excellent good fair deteriorated ruinous

Narrative Description of Resource See continuation sheet

Archaeological Remains _____ Check if Archaeological Form Completed

RESEARCH METHODS (check all that apply)

FMSF record search (sites/surveys) library research building permits Sanborn maps
 FL State Archives/photo collection city directory occupant/owner interview plat maps
 property appraiser / tax records newspaper files neighbor interview Public Lands Survey (DEP)
 cultural resource survey (CRAS) historic photos interior inspection HABS/HAER record search
 other methods (describe) _____

Bibliographic References (give FMSF manuscript # if relevant, use continuation sheet if needed) See continuation sheet

OPINION OF RESOURCE SIGNIFICANCE

Appears to meet the criteria for National Register listing individually? yes no insufficient information

Appears to meet the criteria for National Register listing as part of a district? yes no insufficient information

Explanation of Evaluation (required, whether significant or not; use separate sheet if needed) See continuation sheet

Area(s) of Historical Significance (see *National Register Bulletin 15*, p. 8 for categories: e.g. "architecture", "ethnic heritage", "community planning & development", etc.)

1. Other 3. _____ 5. _____
 2. Transportation 4. _____ 6. _____

DOCUMENTATION

Accessible Documentation Not Filed with the Site File - including field notes, analysis notes, photos, plans and other important documents

1) Document type All materials at one location Maintaining organization Archaeological Consultants Inc
 Document description _____ File or accession #'s P9026Q
 2) Document type _____ Maintaining organization _____
 Document description _____ File or accession #'s _____

RECORDER INFORMATION

Recorder Name Christopher Berger Affiliation Archaeological Consultants Inc

Recorder Contact Information 8110 Blaikie Court, Suite A, Sarasota, FL 34240/941-379-6206/ACIFlorida@comcast.net
 (address / phone / fax / e-mail)

Required Attachments

- ① USGS 7.5' MAP WITH STRUCTURE LOCATION PINPOINTED IN RED
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- ③ PHOTO OF MAIN FACADE, ARCHIVAL B&W PRINT OR DIGITAL IMAGE FILE

If submitting an image file, it must be included on disk or CD AND in hard copy format (plain paper is acceptable).
 Digital image must be at least 1600 x 1200 pixels, 24-bit color, jpeg or tiff.

CONTINUATION SHEET**Narrative Description**

NLAX 170 (8BR2908) is a 70-ton aft skirt railroad car within the NASA Kennedy Space Center (KSC) Railroad System. The steel flatcar is 66' long, weighs 70 tons, and features a double well design. The car rests on four axles, and two steel vertical bulkhead beams approximately 12' tall with supports are located at both ends (KSC-TO, Folder No. 6670-5-170).

NLAX 170, along with NLAX 171 (8BR3042), was built for NASA specifically to transport solid rocket booster (SRB) components. Davidson-Kennedy Company of Atlanta, Georgia, was awarded the contract to build the car on July 22, 1983, and they subcontracted the carbody design to Nelson Associates of Springfield, Virginia. The railcars were slow to receive Association of American Railroad approval, likely because of their uncommon design. NLAX 170 cost \$84,571 and arrived at the KSC on April 19, 1985 (KSC-TO, Folder No. 6670-5-171). It was designed to hold one frustum, one forward skirt, and two aft skirts. Boxes that contained the ground support equipment used to load, transport, and off load SRB components were strapped to the car's deck. According to correspondence dated July 30, 1987, the car traveled from NASA's Marshall Space Flight Center and McDonnell Douglas Astronautics Company West in Huntington Beach, California, where the SRB components were manufactured, to KSC. Before NLAX 170 and NLAX 171, these four SRB components required three trucks and a railcar for transport. They are the only two of their kind in the world, and the NASA Railroad crew referred to them as "Carnival Cars" because of their unique appearance.

According to NASA KSC Transportation Office correspondence, NLAX 170 was leased to United Space Boosters Inc. for cross-country conveyance in the late 1980s. Records also show NLAX 170 received minor damage when it scraped a bridge abutment in Missouri on March 1, 1990, while en route from Long Beach to the KSC; however, the railcar was allowed to continue to the center (KSC-TO, Folder No. 6670-5-170).

Explanation of Evaluation

NLAX 170 is considered eligible for listing in the National Register of Historic Places as a contributing resource to the NASA KSC Railroad System Historic District (8BR2932), which is eligible in the context of the U.S. Space Shuttle Program (ca. 1969-2011). The car is significant because it is one of only two railcars within the NASA KSC Railroad System commissioned by NASA and designed for a specified use. The railcar is also significant because of the role it played in support of the Space Shuttle Program in the transport of SRB components; it could carry four irregularly shaped SRB components that would have otherwise required three trucks and a railcar to transport. Thus, the cars offered a great deal of time and financial savings to NASA in their more than two decades of service. NLAX 170 has retained a high level of integrity and appears nearly identical to its original appearance.

Bibliographic References

NASA KSC, Transportation Office (KSC-TO)

Var. Folder No. 6670-5-170: NLAX 170 SRB Components Railcar

Var. Folder No. 6670-5-171: NLAX 170 SRB Components Railcar

Stephens, Mike (KSC Railroad technician)

2012 Email interview by Christopher Berger. March 7, 2012. Notes on file at Archaeological Consultants Inc.



PHOTOGRAPHS



NLAX 170, 70-Ton Aft Skirt, sides



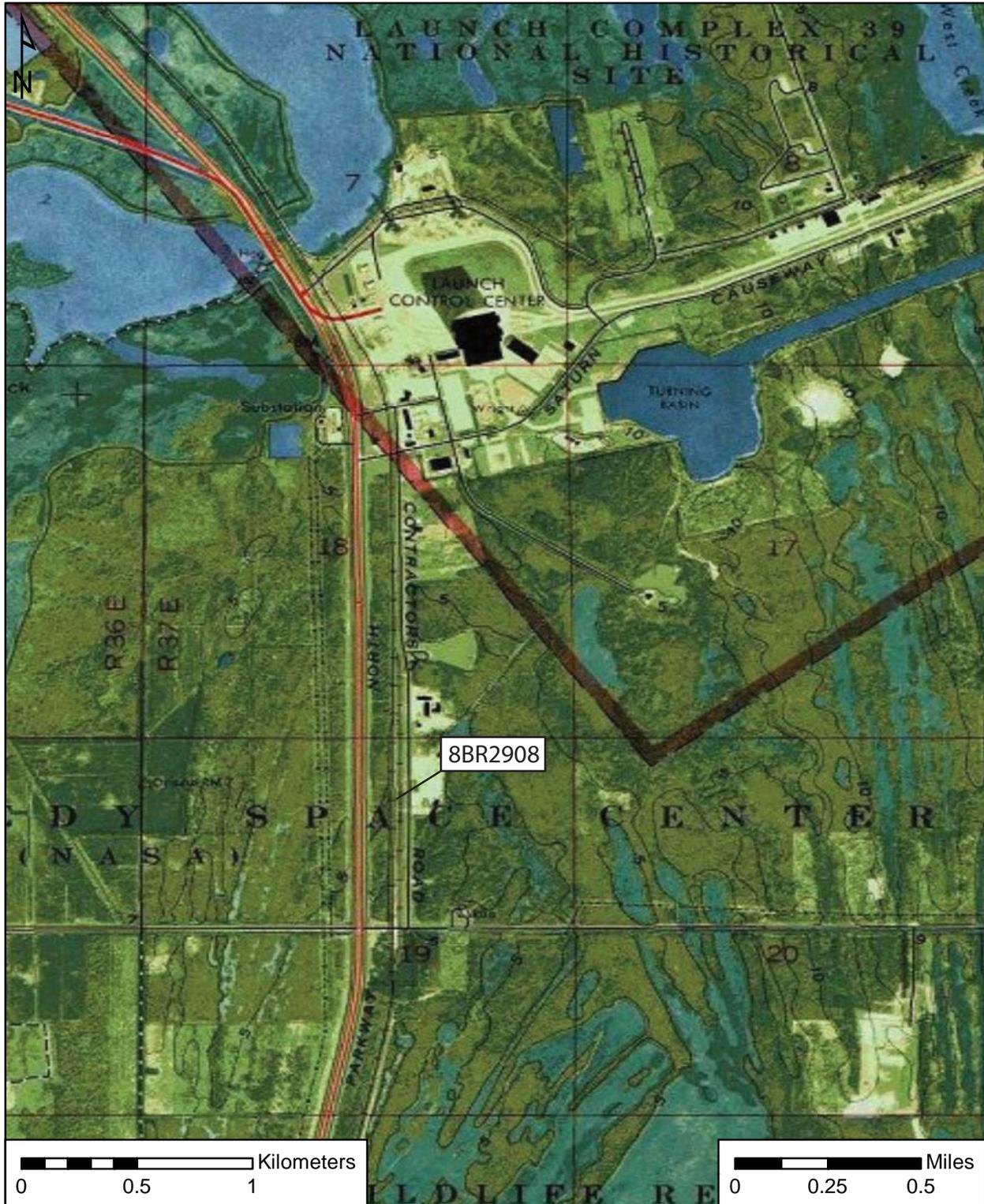
NLAX 170 and NLAX 171, 70-Ton Aft Skirt railcars, top



USGS

Orsino

Township 22 South, Range 37 East, Section 19
National Geographic Society (2011) USA Topo Maps.



Original
 Update



HISTORICAL STRUCTURE FORM

FLORIDA MASTER SITE FILE

Version 4.0 1/07

Site #8 **BR03042**
Field Date 1-24-2012
Form Date 11-13-2012
Recorder # _____

Shaded Fields represent the minimum acceptable level of documentation.
Consult the *Guide to Historical Structure Forms* for detailed instructions.

Site Name(s) (address if none) NLAX 171 Multiple Listing (DHR only) _____
Survey Project Name Historic Survey of NASA Railroad System Survey # (DHR only) _____
National Register Category (please check one) building structure district site object
Ownership: private-profit private-nonprofit private-individual private-nonspecific city county state federal Native American foreign unknown

LOCATION & MAPPING

Address: Contractor Street Number _____ Direction _____ Street Name _____ Street Type _____ Suffix Direction _____
Cross Streets (nearest / between) Schwartz Road and Saturn Causeway
USGS 7.5 Map Name ORSINO USGS Date 1976 Plat or Other Map _____
City / Town (within 3 miles) Titusville In City Limits? yes no unknown County Brevard
Township 22S Range 37E Section 19 1/4 section: NW SW SE NE Irregular-name: _____
Tax Parcel # _____ Landgrant _____
Subdivision Name _____ Block _____ Lot _____
UTM Coordinates: Zone 16 17 Easting 533794 Northing 3160101
Other Coordinates: X: _____ Y: _____ Coordinate System & Datum _____
Name of Public Tract (e.g., park) _____

HISTORY

Construction Year: 1985 approximately year listed or earlier year listed or later
Original Use Other From (year): _____ To (year): _____
Current Use Other From (year): _____ To (year): _____
Other Use Railcar From (year): _____ To (year): _____
Moves: yes no unknown Date: _____ Original address _____
Alterations: yes no unknown Date: _____ Nature _____
Additions: yes no unknown Date: _____ Nature _____
Architect (last name first): _____ Builder (last name first): Davidson-Kennedy
Ownership History (especially original owner, dates, profession, etc.) NASA, 1985-present

Is the Resource Affected by a Local Preservation Ordinance? yes no unknown Describe _____

DESCRIPTION

Style Not applicable Exterior Plan Not applicable Number of Stories NA
Exterior Fabric(s) 1. Steel 2. _____ 3. _____
Roof Type(s) 1. _____ 2. _____ 3. _____
Roof Material(s) 1. _____ 2. _____ 3. _____
Roof secondary strucs. (dormers etc.) 1. _____ 2. _____
Windows (types, materials, etc.) _____

Distinguishing Architectural Features (exterior or interior ornaments) _____

Ancillary Features / Outbuildings (record outbuildings, major landscape features; use continuation sheet if needed.) _____

DHR USE ONLY		OFFICIAL EVALUATION		DHR USE ONLY	
NR List Date	SHPO – Appears to meet criteria for NR listing: <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> insufficient info	Date	_____	Init.	_____
<input type="checkbox"/> Owner Objection	KEEPER – Determined eligible: <input type="checkbox"/> yes <input type="checkbox"/> no	Date	_____		
	NR Criteria for Evaluation: <input type="checkbox"/> a <input type="checkbox"/> b <input type="checkbox"/> c <input type="checkbox"/> d (see <i>National Register Bulletin 15</i> , p. 2)				

DESCRIPTION (continued)

Chimney: No. ____ Chimney Material(s): 1. _____ 2. _____
 Structural System(s): 1. _____ 2. _____ 3. _____
 Foundation Type(s): 1. _____ 2. _____
 Foundation Material(s): 1. _____ 2. _____
 Main Entrance (stylistic details) _____

Porch Descriptions (types, locations, roof types, etc.) _____

Condition (overall resource condition): excellent good fair deteriorated ruinous

Narrative Description of Resource See continuation sheet

Archaeological Remains _____ Check if Archaeological Form Completed

RESEARCH METHODS (check all that apply)

FMSF record search (sites/surveys) library research building permits Sanborn maps
 FL State Archives/photo collection city directory occupant/owner interview plat maps
 property appraiser / tax records newspaper files neighbor interview Public Lands Survey (DEP)
 cultural resource survey (CRAS) historic photos interior inspection HABS/HAER record search
 other methods (describe) _____

Bibliographic References (give FMSF manuscript # if relevant, use continuation sheet if needed) See continuation sheet

OPINION OF RESOURCE SIGNIFICANCE

Appears to meet the criteria for National Register listing individually? yes no insufficient information

Appears to meet the criteria for National Register listing as part of a district? yes no insufficient information

Explanation of Evaluation (required, whether significant or not; use separate sheet if needed) See continuation sheet

Area(s) of Historical Significance (see *National Register Bulletin 15*, p. 8 for categories: e.g. "architecture", "ethnic heritage", "community planning & development", etc.)

1. Other 3. _____ 5. _____
 2. Transportation 4. _____ 6. _____

DOCUMENTATION

Accessible Documentation Not Filed with the Site File - including field notes, analysis notes, photos, plans and other important documents

- 1) Document type All materials at one location Maintaining organization Archaeological Consultants Inc
 Document description _____ File or accession #'s P9026Q
- 2) Document type _____ Maintaining organization _____
 Document description _____ File or accession #'s _____

RECORDER INFORMATION

Recorder Name Trish Slovinac Affiliation Archaeological Consultants Inc

Recorder Contact Information 8110 Blaikie Court, Suite A, Sarasota, FL 34240/941-379-6206/ACIFlorida@comcast.net
 (address / phone / fax / e-mail)

Required Attachments

- ① USGS 7.5' MAP WITH STRUCTURE LOCATION PINPOINTED IN RED
- ② LARGE SCALE STREET, PLAT OR PARCEL MAP (available from most property appraiser web sites)
- ③ PHOTO OF MAIN FACADE, ARCHIVAL B&W PRINT OR DIGITAL IMAGE FILE

If submitting an image file, it must be included on disk or CD AND in hard copy format (plain paper is acceptable).
 Digital image must be at least 1600 x 1200 pixels, 24-bit color, jpeg or tiff.

CONTINUATION SHEET**Narrative Description**

NLAX 171 (8BR3042) is a 70-ton aft skirt railroad car within the NASA Kennedy Space Center (KSC) Railroad System. The steel flatcar is 66' long, weighs 70 tons, and features a double well design. The car rests on four axles, and two steel vertical bulkhead beams approximately 12' tall with supports are located at both ends (KSC-TO, Folder No. 6670-5-170).

NLAX 171, along with NLAX 170 (8BR2908), was built for NASA specifically to transport solid rocket booster (SRB) components. Davidson-Kennedy Company of Atlanta, Georgia, was awarded the contract to build the car on July 22, 1983, and they subcontracted the carbody design to Nelson Associates of Springfield, Virginia. The railcars were slow to receive Association of American Railroad approval, likely because of their uncommon design. NLAX 171 cost \$84,571 and arrived at the KSC on April 19, 1985 (KSC-TO, Folder No. 6670-5-171). It was designed to hold one frustum, one forward skirt, and two aft skirts. Boxes that contained the ground support equipment used to load, transport, and off load SRB components were strapped to the car's deck. According to correspondence dated July 30, 1987, the car traveled from NASA's Marshall Space Flight Center and McDonnell Douglas Astronautics Company West in Huntington Beach, California, where the SRB components were manufactured, to KSC. Before NLAX 170 and NLAX 171, these four SRB components required three trucks and a railcar for transport. They are the only two of their kind in the world, and the NASA Railroad crew referred to them as "Carnival Cars" because of their unique appearance.

According to NASA KSC Transportation Office correspondence, NLAX 171 was leased to United Space Boosters Inc. for cross-country conveyance in the late 1980s (KSC-TO, Folder No. 6670-5-170).

Explanation of Evaluation

NLAX 171 is considered eligible for listing in the National Register of Historic Places as a contributing resource to the NASA KSC Railroad System Historic District (8BR2932), which is eligible in the context of the U.S. Space Shuttle Program (ca. 1969-2011). The car is significant because it is one of only two railcars within the NASA KSC Railroad System commissioned by NASA and designed for a specified use. The railcar is also significant because of the role it played in support of the Space Shuttle Program in the transport of SRB components; it could carry four irregularly shaped SRB components that would have otherwise required three trucks and a railcar to transport. Thus, the cars offered a great deal of time and financial savings to NASA in their more than two decades of service. NLAX 171 has retained a high level of integrity and appears nearly identical to its original appearance.

Bibliographic References

NASA KSC, Transportation Office (KSC-TO)

Var. Folder No. 6670-5-170: NLAX 170 SRB Components Railcar

Var. Folder No. 6670-5-171: NLAX 170 SRB Components Railcar

Stephens, Mike (KSC Railroad technician)

2012 Email interview by Christopher Berger. March 7, 2012. Notes on file at Archaeological Consultants Inc.



PHOTOGRAPHS



NLAX 171, 70-Ton Aft Skirt, side



NLAX 170 and NLAX 171, 70-Ton Aft Skirt railcars, top

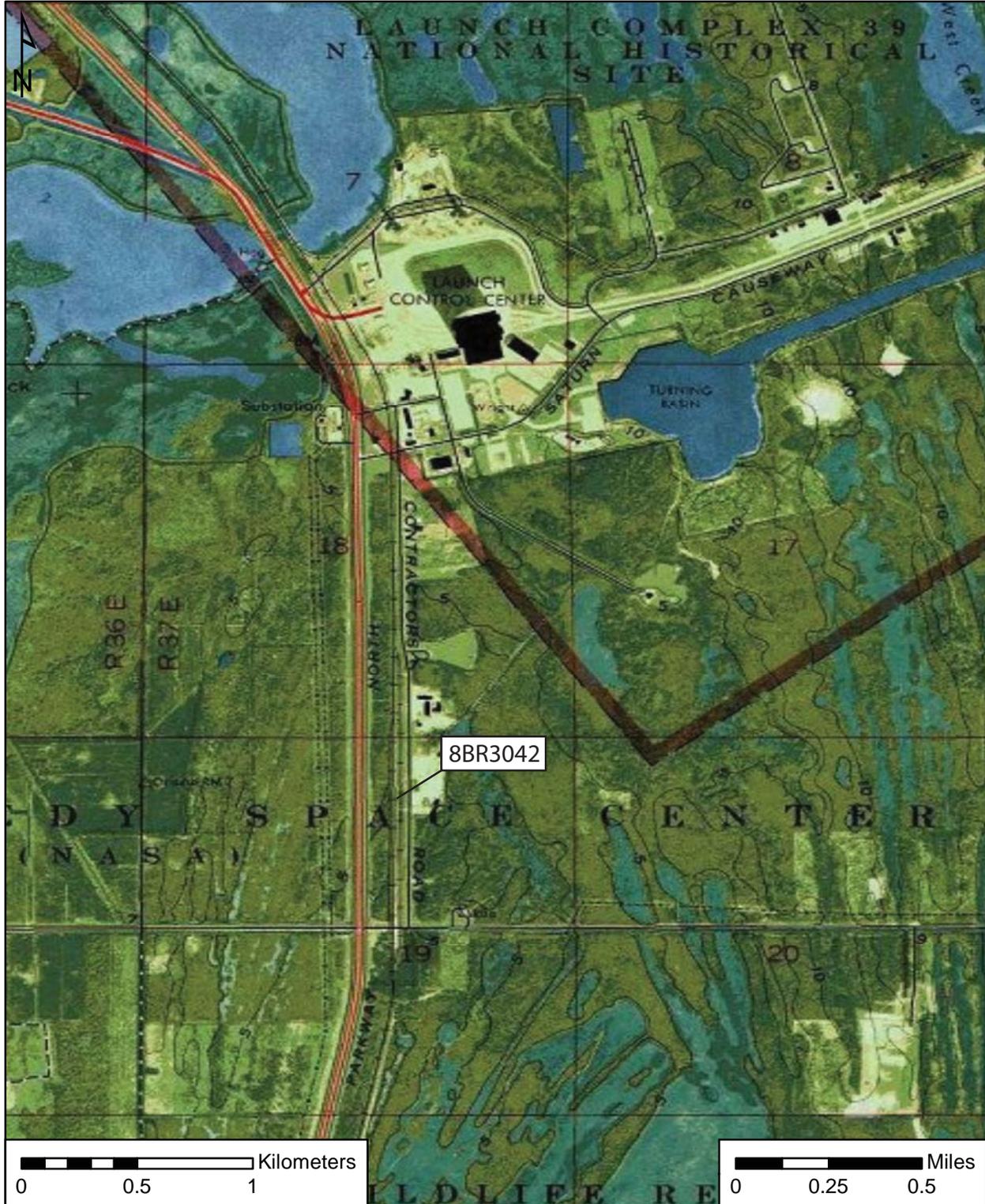


USGS

Orsino

Township 22 South, Range 37 East, Section 19

National Geographic Society (2011) USA Topo Maps.



Original
 Update



HISTORICAL STRUCTURE FORM

FLORIDA MASTER SITE FILE

Version 4.0 1/07

Site #8 **BR02909**
Field Date 1-24-2012
Form Date 2-9-2012
Recorder # 3

Shaded Fields represent the minimum acceptable level of documentation.
Consult the *Guide to Historical Structure Forms* for detailed instructions.

Site Name(s) (address if none) NLAX 120; NLAX 121 Multiple Listing (DHR only) _____
Survey Project Name Historic Survey of NASA Railroad System Survey # (DHR only) _____
National Register Category (please check one) building structure district site object
Ownership: private-profit private-nonprofit private-individual private-nonspecific city county state federal Native American foreign unknown

LOCATION & MAPPING

Address: Contractor Street Number _____ Direction _____ Street Name _____ Street Type Road Suffix Direction _____
Cross Streets (nearest / between) Schwartz Road and Saturn Causeway
USGS 7.5 Map Name ORSINO USGS Date 1976 Plat or Other Map _____
City / Town (within 3 miles) Titusville In City Limits? yes no unknown County Brevard
Township 22S Range 37E Section 19 1/4 section: NW SW SE NE Irregular-name: _____
Tax Parcel # Not applicable Landgrant _____
Subdivision Name _____ Block _____ Lot _____
UTM Coordinates: Zone 16 17 Easting 533794 Northing 3160101
Other Coordinates: X: _____ Y: _____ Coordinate System & Datum _____
Name of Public Tract (e.g., park) _____

HISTORY

Construction Year: 1961 approximately year listed or earlier year listed or later
Original Use Other From (year): 1961 To (year): curr
Current Use Other From (year): _____ To (year): _____
Other Use Railcar From (year): _____ To (year): _____
Moves: yes no unknown Date: _____ Original address _____
Alterations: yes no unknown Date: _____ Nature _____
Additions: yes no unknown Date: _____ Nature _____
Architect (last name first): _____ Builder (last name first): Pullman
Ownership History (especially original owner, dates, profession, etc.) Western Pacific, dates unknown; Ortner, unknown to 1982; NASA, 1982-present
Is the Resource Affected by a Local Preservation Ordinance? yes no unknown Describe _____

DESCRIPTION

Style Not applicable Exterior Plan Not applicable Number of Stories NA
Exterior Fabric(s) 1. Steel 2. _____ 3. _____
Roof Type(s) 1. _____ 2. _____ 3. _____
Roof Material(s) 1. _____ 2. _____ 3. _____
Roof secondary strucs. (dormers etc.) 1. _____ 2. _____
Windows (types, materials, etc.) _____
Distinguishing Architectural Features (exterior or interior ornaments) _____
Ancillary Features / Outbuildings (record outbuildings, major landscape features; use continuation sheet if needed.) _____

DHR USE ONLY		OFFICIAL EVALUATION		DHR USE ONLY	
NR List Date _____	SHPO – Appears to meet criteria for NR listing: <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> insufficient info	Date _____	Init. _____		
<input type="checkbox"/> Owner Objection	KEEPER – Determined eligible: <input type="checkbox"/> yes <input type="checkbox"/> no	Date _____			
	NR Criteria for Evaluation: <input type="checkbox"/> a <input type="checkbox"/> b <input type="checkbox"/> c <input type="checkbox"/> d (see <i>National Register Bulletin 15</i> , p. 2)				

DESCRIPTION (continued)

Chimney: No. ___ Chimney Material(s): 1. ___ 2. ___
Structural System(s): 1. ___ 2. ___ 3. ___
Foundation Type(s): 1. ___ 2. ___
Foundation Material(s): 1. ___ 2. ___
Main Entrance (stylistic details) ___

Porch Descriptions (types, locations, roof types, etc.) ___

Condition (overall resource condition): [] excellent [] good [x] fair [] deteriorated [] ruinous
Narrative Description of Resource See continuation sheet

Archaeological Remains ___ [] Check if Archaeological Form Completed

RESEARCH METHODS (check all that apply)

- [x] FMSF record search (sites/surveys) [x] library research [] building permits [] Sanborn maps
[] FL State Archives/photo collection [] city directory [x] occupant/owner interview [] plat maps
[] property appraiser / tax records [x] newspaper files [] neighbor interview [] Public Lands Survey (DEP)
[] cultural resource survey (CRAS) [x] historic photos [x] interior inspection [] HABS/HAER record search
[] other methods (describe) ___

Bibliographic References (give FMSF manuscript # if relevant, use continuation sheet if needed) See continuation sheet

OPINION OF RESOURCE SIGNIFICANCE

Appears to meet the criteria for National Register listing individually? [] yes [x] no [] insufficient information
Appears to meet the criteria for National Register listing as part of a district? [] yes [x] no [] insufficient information

Explanation of Evaluation (required, whether significant or not; use separate sheet if needed) Although NASA owns these railcars, they were not a significant contributor to any U.S. manned space program; therefore, they are not considered individually eligible for the NRHP, nor are they considered contributing to the NASA KSC Railroad HD.

Area(s) of Historical Significance (see National Register Bulletin 15, p. 8 for categories: e.g. "architecture", "ethnic heritage", "community planning & development", etc.)
1. Other 3. 5.
2. Transportation 4. 6.

DOCUMENTATION

Accessible Documentation Not Filed with the Site File - including field notes, analysis notes, photos, plans and other important documents
1) Document type All materials at one location Maintaining organization Archaeological Consultants Inc
Document description File or accession #'s P9026Q
2) Document type Maintaining organization
Document description File or accession #'s

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1 USGS 7.5' MAP WITH STRUCTURE LOCATION PINPOINTED IN RED
2 LARGE SCALE STREET, PLAT OR PARCEL MAP (available from most property appraiser web sites)
3 PHOTO OF MAIN FACADE, ARCHIVAL B&W PRINT OR DIGITAL IMAGE FILE
If submitting an image file, it must be included on disk or CD AND in hard copy format (plain paper is acceptable). Digital image must be at least 1600 x 1200 pixels, 24-bit color, jpeg or tiff.

CONTINUATION SHEET**Narrative Description:**

NLAX 120 and NLAX 121 are 55-ton, 90'-flat railroad cars NASA Kennedy Space Center Railroad System. The steel flatcars have four axles and a cushioned underframe and measure 10'-1" wide and 3'-6" tall (KSC-TO, Folder No. Blue Ox Special Hopper Pullman Standard 1976; Formerly PLCX 81). The car's deck is cut out in the middle, and isosceles trapezoid bulkheads are attached at both ends. Metal tanks are located in the middle of the railcars, just below the underdeck.

NLAX 120 and NLAX 121 were both built by Pullman in 1961 and owned by Western Pacific. NLAX 120 had the number WP 85041, and NLAX 121 had WP 85021. NASA bought the two cars for \$5,300 each from Ortner Freight Car Co. in September 1982, and Ortner subsequently won the contract to modify the cars (KSC-TO 1987). They were used by NASA in support of the Space Shuttle Program to transport orbiter tailcone boxes (KSC-TO 1985).

Bibliographic References:

NASA KSC, Transportation Office (KSC-TO)

1985 NASA Railroad Car Data Sheet.

1987 NASA Railroad Equipment Listing. August 10.

Var. Folder No. Blue Ox Special Hopper Pullman Standard 1976; Formerly PLCX 81



PHOTOGRAPHS



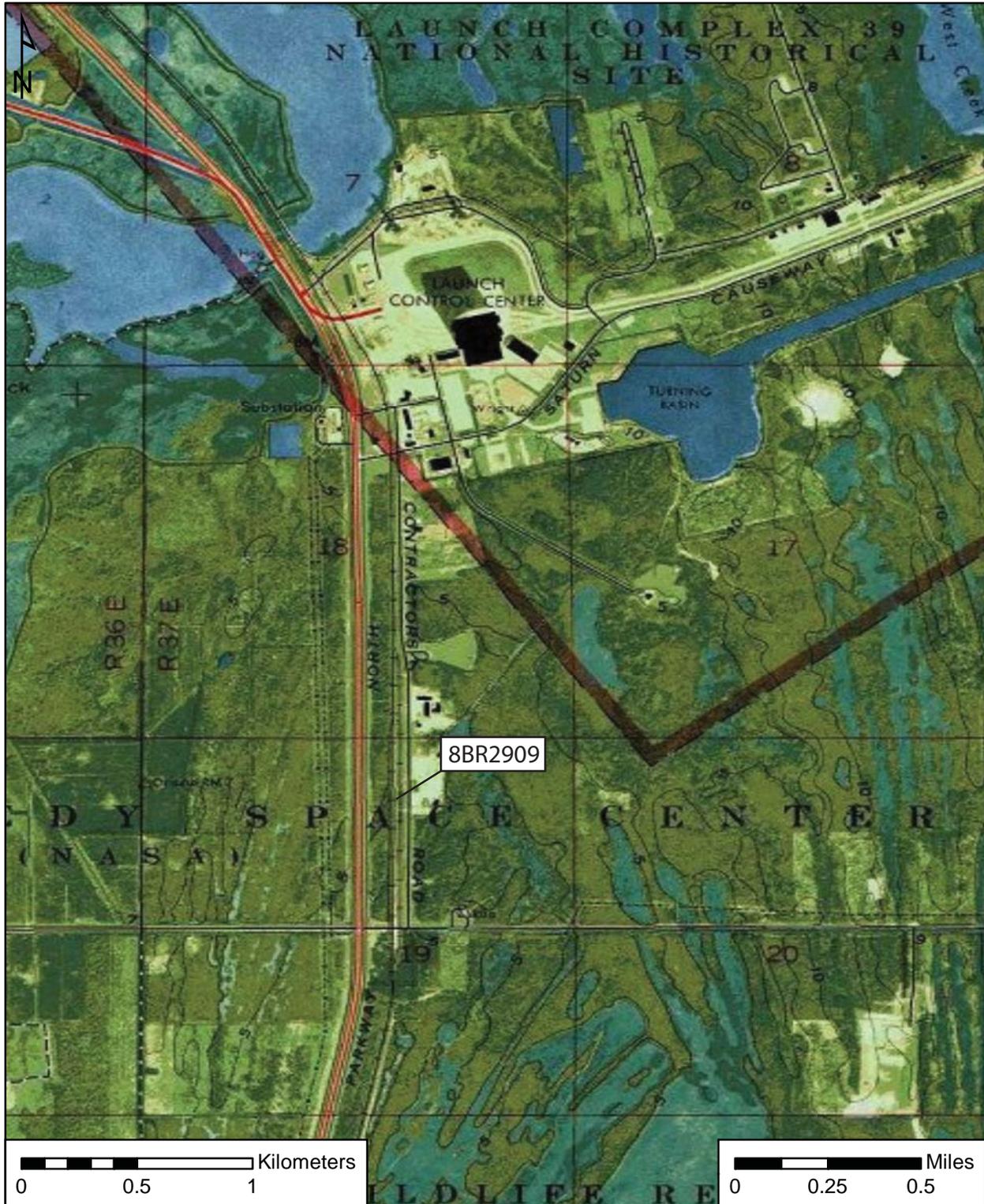
NLAX 121, 55-Ton, 90-Foot Flat



USGS

Orsino

Township 22 South, Range 37 East, Section 19
National Geographic Society (2011) *USA Topo Maps*.



Original
 Update



HISTORICAL STRUCTURE FORM

FLORIDA MASTER SITE FILE

Version 4.0 1/07

Site #8 **BR02910**
Field Date 1-24-2012
Form Date 2-7-2012
Recorder # 4

Shaded Fields represent the minimum acceptable level of documentation.
Consult the *Guide to Historical Structure Forms* for detailed instructions.

Site Name(s) (address if none) NLAX 190 Multiple Listing (DHR only) _____
Survey Project Name Historic Survey of NASA Railroad System Survey # (DHR only) _____
National Register Category (please check one) building structure district site object
Ownership: private-profit private-nonprofit private-individual private-nonspecific city county state federal Native American foreign unknown

LOCATION & MAPPING

Address: Contractor Street Number _____ Direction _____ Street Name _____ Street Type Road Suffix Direction _____
Cross Streets (nearest / between) Schwartz Road and Saturn Causeway
USGS 7.5 Map Name ORSINO USGS Date 1976 Plat or Other Map _____
City / Town (within 3 miles) Titusville In City Limits? yes no unknown County Brevard
Township 22S Range 37E Section 19 1/4 section: NW SW SE NE Irregular-name: _____
Tax Parcel # Not applicable Landgrant _____
Subdivision Name _____ Block _____ Lot _____
UTM Coordinates: Zone 16 17 Easting 533794 Northing 3160101
Other Coordinates: X: _____ Y: _____ Coordinate System & Datum _____
Name of Public Tract (e.g., park) _____

HISTORY

Construction Year: 1982 approximately year listed or earlier year listed or later
Original Use Other From (year): 1982 To (year): cur
Current Use Other From (year): _____ To (year): _____
Other Use Railcar From (year): _____ To (year): _____
Moves: yes no unknown Date: _____ Original address _____
Alterations: yes no unknown Date: _____ Nature _____
Additions: yes no unknown Date: _____ Nature _____
Architect (last name first): _____ Builder (last name first): General American Transportation
Ownership History (especially original owner, dates, profession, etc.) NASA, 1982-present

Is the Resource Affected by a Local Preservation Ordinance? yes no unknown Describe _____

DESCRIPTION

Style Not applicable Exterior Plan Not applicable Number of Stories NA
Exterior Fabric(s) 1. Steel 2. _____ 3. _____
Roof Type(s) 1. _____ 2. _____ 3. _____
Roof Material(s) 1. _____ 2. _____ 3. _____
Roof secondary strucs. (dormers etc.) 1. _____ 2. _____
Windows (types, materials, etc.) _____

Distinguishing Architectural Features (exterior or interior ornaments) _____

Ancillary Features / Outbuildings (record outbuildings, major landscape features; use continuation sheet if needed.) _____

DHR USE ONLY		OFFICIAL EVALUATION		DHR USE ONLY	
NR List Date _____	SHPO – Appears to meet criteria for NR listing: <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> insufficient info	Date _____	Init. _____		
<input type="checkbox"/> Owner Objection	KEEPER – Determined eligible: <input type="checkbox"/> yes <input type="checkbox"/> no	Date _____			
	NR Criteria for Evaluation: <input type="checkbox"/> a <input type="checkbox"/> b <input type="checkbox"/> c <input type="checkbox"/> d (see <i>National Register Bulletin 15</i> , p. 2)				

DESCRIPTION (continued)

Chimney: No. ____ Chimney Material(s): 1. _____ 2. _____
 Structural System(s): 1. _____ 2. _____ 3. _____
 Foundation Type(s): 1. _____ 2. _____
 Foundation Material(s): 1. _____ 2. _____
 Main Entrance (stylistic details) _____

Porch Descriptions (types, locations, roof types, etc.) _____

Condition (overall resource condition): excellent good fair deteriorated ruinous

Narrative Description of Resource See continuation sheet

Archaeological Remains _____ Check if Archaeological Form Completed

RESEARCH METHODS (check all that apply)

FMSF record search (sites/surveys) library research building permits Sanborn maps
 FL State Archives/photo collection city directory occupant/owner interview plat maps
 property appraiser / tax records newspaper files neighbor interview Public Lands Survey (DEP)
 cultural resource survey (CRAS) historic photos interior inspection HABS/HAER record search
 other methods (describe) _____

Bibliographic References (give FMSF manuscript # if relevant, use continuation sheet if needed) See continuation sheet

OPINION OF RESOURCE SIGNIFICANCE

Appears to meet the criteria for National Register listing individually? yes no insufficient information

Appears to meet the criteria for National Register listing as part of a district? yes no insufficient information

Explanation of Evaluation (required, whether significant or not; use separate sheet if needed) Although NASA owns this railcar, it was not a significant contributor to any U.S. manned space program; therefore, it is not considered individually eligible for the NRHP, nor is it considered contributing to the NASA KSC Railroad System HD.

Area(s) of Historical Significance (see *National Register Bulletin 15*, p. 8 for categories: e.g. "architecture", "ethnic heritage", "community planning & development", etc.)

1. Other 3. _____ 5. _____
 2. Transportation 4. _____ 6. _____

DOCUMENTATION

Accessible Documentation Not Filed with the Site File - including field notes, analysis notes, photos, plans and other important documents

1) Document type All materials at one location Maintaining organization Archaeological Consultants Inc
 Document description _____ File or accession #'s P9026Q

2) Document type _____ Maintaining organization _____
 Document description _____ File or accession #'s _____

RECORDER INFORMATION

Recorder Name Christopher Berger Affiliation Archaeological Consultants Inc

Recorder Contact Information 8110 Blaikie Court, Suite A, Sarasota, FL 34240/941-379-6206/ACIFlorida@comcast.net
 (address / phone / fax / e-mail)

Required Attachments

- ① USGS 7.5' MAP WITH STRUCTURE LOCATION PINPOINTED IN RED
- ② LARGE SCALE STREET, PLAT OR PARCEL MAP (available from most property appraiser web sites)
- ③ PHOTO OF MAIN FACADE, ARCHIVAL B&W PRINT OR DIGITAL IMAGE FILE

If submitting an image file, it must be included on disk or CD AND in hard copy format (plain paper is acceptable).
 Digital image must be at least 1600 x 1200 pixels, 24-bit color, jpeg or tiff.

CONTINUATION SHEET**Narrative Description:**

NLAX 190 is the only 70-ton tank railroad car within the NASA Kennedy Space Center (KSC) Railroad System. The steel railcar is 44' long, and the tank holds approximately 15,000 gallons. The railcar, which has an underframe, rests on four axles and two trucks. A bottom outlet and discharge pipe are below the tank, and there are handrails at either end of the car. A ladder in the middle of the tank leads to a 20" manway with a safety valve in the center.

NLAX 190, model DOT III A100W1, was built in 1982 by General American Transportation and purchased new by NASA—the first new car bought for the NASA KSC Railroad—for \$70,000 to transport Freon 113 from vendors in Louisiana using the Family Lines Railroad System (NASA-TO, Folder No. 6670-5-190). It replaced two World War II-era Army cars, DODX 7503 and 7510 (KSC Archives, Folder No. 6630-3-1). The Florida Fish and Wildlife Conservation Commission has used NLAX 190 to hold water used to fight brush fires (Hoffman 2012).

Bibliographic References:

Hoffman, Dave (retired NASA Railroad Manager).

2012 Interview by Christopher Berger and Patricia Slovinac, February 27. Notes on file at Archaeological Consultants, Inc.

NASA KSC, Archives Department

Var. Box 1, Folder No. 6630-3-1

NASA KSC, Transportation Office (KSC-TO)

1980 Folder No. 6670-5-190, Estimate Data Sheet.



PHOTOGRAPHS



NLAX 190, 70-Ton Tank

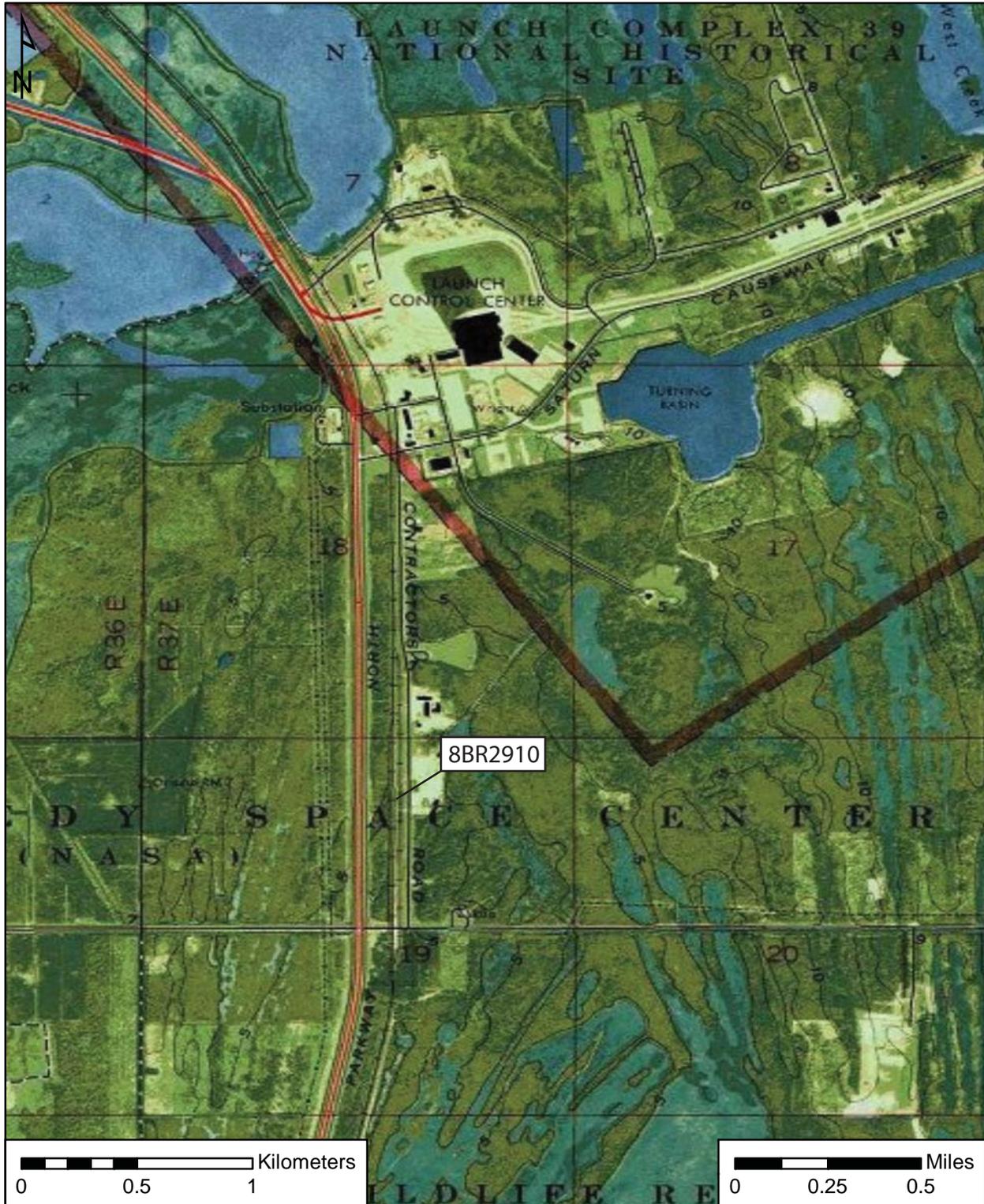


USGS

Orsino

Township 22 South, Range 37 East, Section 19

National Geographic Society (2011) USA Topo Maps.



Original
 Update



HISTORICAL STRUCTURE FORM

FLORIDA MASTER SITE FILE

Version 4.0 1/07

Site #8 **BR02911**
Field Date 1-24-2012
Form Date 2-3-2012
Recorder # 5

Shaded Fields represent the minimum acceptable level of documentation.
Consult the *Guide to Historical Structure Forms* for detailed instructions.

Site Name(s) (address if none) NLAX 191; NLAX 197; NLAX 198; NLAX 890 Multiple Listing (DHR only) _____
Survey Project Name Historic Survey of NASA Railroad System Survey # (DHR only) _____
National Register Category (please check one) building structure district site object
Ownership: private-profit private-nonprofit private-individual private-nonspecific city county state federal Native American foreign unknown

LOCATION & MAPPING

Address: Contractor Street Number _____ Direction _____ Street Name _____ Street Type Road Suffix Direction _____
Cross Streets (nearest / between) Schwartz Road and Saturn Causeway
USGS 7.5 Map Name ORSINO USGS Date 1976 Plat or Other Map _____
City / Town (within 3 miles) Titusville In City Limits? yes no unknown County Brevard
Township 22S Range 37E Section 19 1/4 section: NW SW SE NE Irregular-name: _____
Tax Parcel # Not applicable Landgrant _____
Subdivision Name _____ Block _____ Lot _____
UTM Coordinates: Zone 16 17 Easting 533794 Northing 3160101
Other Coordinates: X: _____ Y: _____ Coordinate System & Datum _____
Name of Public Tract (e.g., park) _____

HISTORY

Construction Year: 1970 approximately year listed or earlier year listed or later
Original Use Other From (year): 1970 To (year): cur
Current Use Other From (year): _____ To (year): _____
Other Use Railcar From (year): _____ To (year): _____
Moves: yes no unknown Date: _____ Original address _____
Alterations: yes no unknown Date: _____ Nature See continuation sheet
Additions: yes no unknown Date: _____ Nature _____
Architect (last name first): _____ Builder (last name first): Unknown
Ownership History (especially original owner, dates, profession, etc.) Transferred to NASA from Department of Defense after August 10, 1987.
Is the Resource Affected by a Local Preservation Ordinance? yes no unknown Describe _____

DESCRIPTION

Style Not applicable Exterior Plan Not applicable Number of Stories NA
Exterior Fabric(s) 1. Steel 2. _____ 3. _____
Roof Type(s) 1. Not applicable 2. _____ 3. _____
Roof Material(s) 1. _____ 2. _____ 3. _____
Roof secondary strucs. (dormers etc.) 1. _____ 2. _____
Windows (types, materials, etc.) _____
Distinguishing Architectural Features (exterior or interior ornaments) _____
Ancillary Features / Outbuildings (record outbuildings, major landscape features; use continuation sheet if needed.) _____

DHR USE ONLY		OFFICIAL EVALUATION		DHR USE ONLY	
NR List Date _____	SHPO – Appears to meet criteria for NR listing: <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> insufficient info	Date _____	Init. _____		
<input type="checkbox"/> Owner Objection	KEEPER – Determined eligible: <input type="checkbox"/> yes <input type="checkbox"/> no	Date _____			
	NR Criteria for Evaluation: <input type="checkbox"/> a <input type="checkbox"/> b <input type="checkbox"/> c <input type="checkbox"/> d (see <i>National Register Bulletin 15</i> , p. 2)				

DESCRIPTION (continued)

Chimney: No. ____ Chimney Material(s): 1. _____ 2. _____
 Structural System(s): 1. _____ 2. _____ 3. _____
 Foundation Type(s): 1. _____ 2. _____
 Foundation Material(s): 1. _____ 2. _____
 Main Entrance (stylistic details) _____

Porch Descriptions (types, locations, roof types, etc.) _____

Condition (overall resource condition): excellent good fair deteriorated ruinous

Narrative Description of Resource See continuation sheet

Archaeological Remains _____ Check if Archaeological Form Completed

RESEARCH METHODS (check all that apply)

FMSF record search (sites/surveys) library research building permits Sanborn maps
 FL State Archives/photo collection city directory occupant/owner interview plat maps
 property appraiser / tax records newspaper files neighbor interview Public Lands Survey (DEP)
 cultural resource survey (CRAS) historic photos interior inspection HABS/HAER record search
 other methods (describe) _____

Bibliographic References (give FMSF manuscript # if relevant, use continuation sheet if needed) See continuation sheet

OPINION OF RESOURCE SIGNIFICANCE

Appears to meet the criteria for National Register listing individually? yes no insufficient information

Appears to meet the criteria for National Register listing as part of a district? yes no insufficient information

Explanation of Evaluation (required, whether significant or not; use separate sheet if needed) Although NASA owns these railcars, they were not a significant contributor to any U.S. manned space program; therefore, they are not considered individually eligible for the NRHP, nor are they considered contributing to the NASA KSC Railroad HD.

Area(s) of Historical Significance (see *National Register Bulletin 15*, p. 8 for categories: e.g. "architecture", "ethnic heritage", "community planning & development", etc.)

1. Other 3. _____ 5. _____
 2. Transportation 4. _____ 6. _____

DOCUMENTATION

Accessible Documentation Not Filed with the Site File - including field notes, analysis notes, photos, plans and other important documents

1) Document type All materials at one location Maintaining organization Archaeological Consultants Inc
 Document description _____ File or accession #'s P9026Q

2) Document type _____ Maintaining organization _____
 Document description _____ File or accession #'s _____

RECORDER INFORMATION

Recorder Name Christopher Berger Affiliation Archaeological Consultants Inc

Recorder Contact Information 8110 Blaikie Court, Suite A, Sarasota, FL 34240/941-379-6206/ACIFlorida@comcast.net
 (address / phone / fax / e-mail)

Required Attachments

- ① USGS 7.5' MAP WITH STRUCTURE LOCATION PINPOINTED IN RED
- ② LARGE SCALE STREET, PLAT OR PARCEL MAP (available from most property appraiser web sites)
- ③ PHOTO OF MAIN FACADE, ARCHIVAL B&W PRINT OR DIGITAL IMAGE FILE

If submitting an image file, it must be included on disk or CD AND in hard copy format (plain paper is acceptable).
 Digital image must be at least 1600 x 1200 pixels, 24-bit color, jpeg or tiff.

CONTINUATION SHEET

Narrative Description:

There are four 100-ton tank railroad cars within the NASA Kennedy Space Center Railroad System: NLAX 191, NLAX 197, NLAX 198, and NLAX 890. Tank cars are used to transport liquids, liquefied gases, compressed gases, or solids liquefied before unloading (RRPictureArchives.net n.d.). Each car has four axles, with two trucks per car. The steel tank railcars all have manways and safety vents on top with handrails. They likely previously belonged to the Department of Defense and were transferred to NASA sometime after the inventory of August 10, 1987 (KSC-TO 1987). NASA used the cars to hold water in support of the solid rocket boosters (Stephens 2012).

NLAX 191 is distinguished by a small tank at one end and handrails at both ends. The stenciling on the side is worn away and only indicates that NLAX 191 has a load limit of 250,500 pounds.

NLAX 197, which has an underframe, was Department of Defense property numbered DODX 4434 before it came into NASA's possession. A Found on Station Equipment Investigation form from January 28, 2003, said it was transferred to NASA circa 1980 and was a model T104 built in 1953 by American Car and Foundry; it originally cost \$6,427 (KSC-TO, Folder No. NLAX 197 Tank Car). However, stencils on the car indicate it was built in December 1962, so it was probably rebuilt then.

NLAX 198 does not have handrails at the ends, unlike the other three 100-ton tank cars. NLAX 198 has an underframe, and the load limit is 193,600 pounds. It was owned by the Department of Defense and had the numbers DODX 14430.

Records indicate NLAX 890 is a model T106 railcar built by General American Transportation Corp. It was purchased by the United States government at an unknown date for \$75,000 and was later transferred to NASA (KSC-TO, Folder No. NLAX 890 Tank Car). Stenciling painted on the railcar indicates it was built in November 1991, yet it also shows that the railcar was tested in 1975 so it was likely that the car's tank was either replaced or refurbished in 1991. Of NASA's four 100-ton tank railcars at the KSC, it is in the best condition.

Bibliographic References:

NASA KSC, Transportation Office (KSC-TO)

1987 NASA Railroad Equipment Listing. August 10.

1999 Found on Station (FOS) Equipment Investigation: NLAX 890 Tank Car

2003 Found on Station (FOS) Equipment Investigation: NLAX 197 Tank Car

RRPictureArchives.net.

n.d. "General Electric Rail Services; Rollingstock; Types; Tank Cars." Accessed February 3 at <http://www.rrpicturearchives.net/rsList.aspx?id=AESX&cid=12>.

Stephens, Mike (KSC Railroad technician).

2012 Email interview by Christopher Berger, March 7. Notes on file at Archaeological Consultants Inc.



PHOTOGRAPHS



NLAX 890 (right), 100-Ton Tank



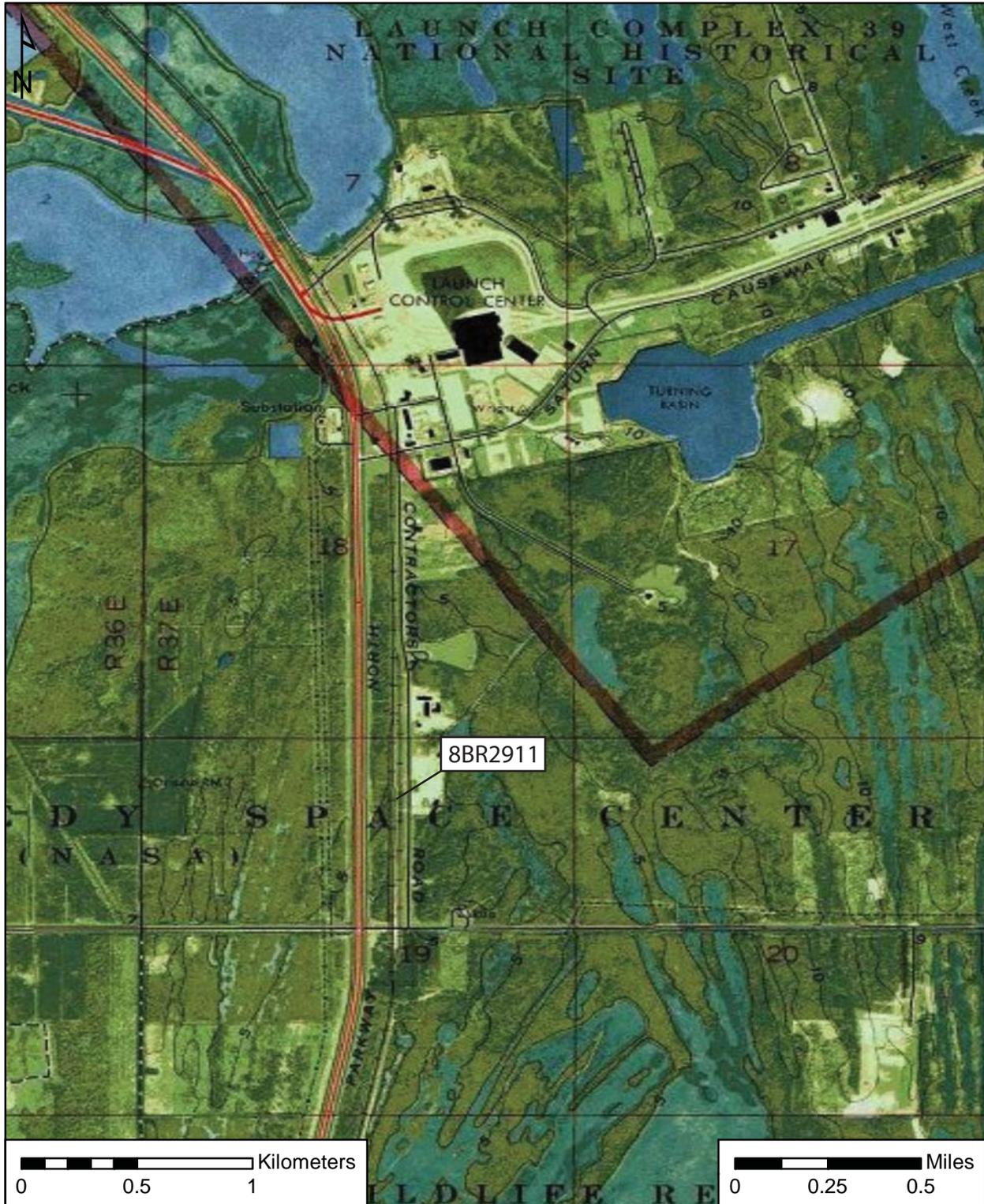
NLAX 191, 100-Ton Tank



USGS

Orsino

Township 22 South, Range 37 East, Section 19
National Geographic Society (2011) USA Topo Maps.



Original
 Update



HISTORICAL STRUCTURE FORM

FLORIDA MASTER SITE FILE

Version 4.0 1/07

Site #8 **BR02912**
Field Date 1-24-2012
Form Date 2-14-2012
Recorder # 6

Shaded Fields represent the minimum acceptable level of documentation.
Consult the *Guide to Historical Structure Forms* for detailed instructions.

Site Name(s) (address if none) NLAX 107-112, 117-119, and 180 Multiple Listing (DHR only) _____
Survey Project Name Historic Survey of NASA Railroad System Survey # (DHR only) _____
National Register Category (please check one) building structure district site object
Ownership: private-profit private-nonprofit private-individual private-nonspecific city county state federal Native American foreign unknown

LOCATION & MAPPING

Address: Contractor Street Number _____ Direction _____ Street Name _____ Street Type _____ Suffix Direction _____
Cross Streets (nearest / between) Schwartz Road and Saturn Causeway
USGS 7.5 Map Name ORSINO USGS Date 1976 Plat or Other Map _____
City / Town (within 3 miles) Titusville In City Limits? yes no unknown County Brevard
Township 22S Range 37E Section 19 1/4 section: NW SW SE NE Irregular-name: _____
Tax Parcel # Not applicable Landgrant _____
Subdivision Name _____ Block _____ Lot _____
UTM Coordinates: Zone 16 17 Easting 533794 Northing 3160101
Other Coordinates: X: _____ Y: _____ Coordinate System & Datum _____
Name of Public Tract (e.g., park) _____

HISTORY

Construction Year: 1973 approximately year listed or earlier year listed or later
Original Use Other From (year): _____ To (year): _____
Current Use Other From (year): _____ To (year): _____
Other Use Railcar From (year): _____ To (year): _____
Moves: yes no unknown Date: _____ Original address _____
Alterations: yes no unknown Date: _____ Nature See continuation sheet
Additions: yes no unknown Date: _____ Nature _____
Architect (last name first): _____ Builder (last name first): See continuation sheet
Ownership History (especially original owner, dates, profession, etc.) See continuation sheet

Is the Resource Affected by a Local Preservation Ordinance? yes no unknown Describe _____

DESCRIPTION

Style Not applicable Exterior Plan Not applicable Number of Stories NA
Exterior Fabric(s) 1. Steel 2. _____ 3. _____
Roof Type(s) 1. _____ 2. _____ 3. _____
Roof Material(s) 1. _____ 2. _____ 3. _____
Roof secondary strucs. (dormers etc.) 1. _____ 2. _____
Windows (types, materials, etc.) _____

Distinguishing Architectural Features (exterior or interior ornaments) _____

Ancillary Features / Outbuildings (record outbuildings, major landscape features; use continuation sheet if needed.) _____

DHR USE ONLY		OFFICIAL EVALUATION		DHR USE ONLY	
NR List Date _____	SHPO – Appears to meet criteria for NR listing: <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> insufficient info	Date _____	Init. _____		
<input type="checkbox"/> Owner Objection	KEEPER – Determined eligible: <input type="checkbox"/> yes <input type="checkbox"/> no	Date _____			
	NR Criteria for Evaluation: <input type="checkbox"/> a <input type="checkbox"/> b <input type="checkbox"/> c <input type="checkbox"/> d (see <i>National Register Bulletin 15</i> , p. 2)				

DESCRIPTION (continued)

Chimney: No. ___ Chimney Material(s): 1. ___ 2. ___
Structural System(s): 1. ___ 2. ___ 3. ___
Foundation Type(s): 1. ___ 2. ___
Foundation Material(s): 1. ___ 2. ___
Main Entrance (stylistic details) ___

Porch Descriptions (types, locations, roof types, etc.) ___

Condition (overall resource condition): [] excellent [x] good [] fair [] deteriorated [] ruinous

Narrative Description of Resource See continuation sheet

Archaeological Remains ___ [] Check if Archaeological Form Completed

RESEARCH METHODS (check all that apply)

- [x] FMSF record search (sites/surveys) [x] library research [] building permits [] Sanborn maps
[] FL State Archives/photo collection [] city directory [x] occupant/owner interview [] plat maps
[] property appraiser / tax records [x] newspaper files [] neighbor interview [] Public Lands Survey (DEP)
[] cultural resource survey (CRAS) [x] historic photos [x] interior inspection [] HABS/HAER record search
[] other methods (describe) ___

Bibliographic References (give FMSF manuscript # if relevant, use continuation sheet if needed) See continuation sheet

OPINION OF RESOURCE SIGNIFICANCE

Appears to meet the criteria for National Register listing individually? [] yes [x] no [] insufficient information

Appears to meet the criteria for National Register listing as part of a district? [] yes [x] no [] insufficient information

Explanation of Evaluation (required, whether significant or not; use separate sheet if needed) Although NASA owns these railcars, they were not a significant contributor to any U.S. manned space program; therefore, they are not considered individually eligible for the NRHP, nor are they considered contributing to the NASA KSC Railroad HD.

Area(s) of Historical Significance (see National Register Bulletin 15, p. 8 for categories: e.g. "architecture", "ethnic heritage", "community planning & development", etc.)

- 1. Other 3. 5.
2. Transportation 4. 6.

DOCUMENTATION

Accessible Documentation Not Filed with the Site File - including field notes, analysis notes, photos, plans and other important documents

- 1) Document type All materials at one location Maintaining organization Archaeological Consultants Inc
Document description File or accession #'s P9026Q
2) Document type Maintaining organization
Document description File or accession #'s

RECORDER INFORMATION

Recorder Name Christopher Berger Affiliation Archaeological Consultants Inc

Recorder Contact Information 8110 Blaikie Court, Suite A, Sarasota, FL 34240/941-379-6206/ACIFlorida@comcast.net
(address / phone / fax / e-mail)

Required Attachments
1 USGS 7.5' MAP WITH STRUCTURE LOCATION PINPOINTED IN RED
2 LARGE SCALE STREET, PLAT OR PARCEL MAP (available from most property appraiser web sites)
3 PHOTO OF MAIN FACADE, ARCHIVAL B&W PRINT OR DIGITAL IMAGE FILE
If submitting an image file, it must be included on disk or CD AND in hard copy format (plain paper is acceptable). Digital image must be at least 1600 x 1200 pixels, 24-bit color, jpeg or tiff.

CONTINUATION SHEET**Narrative Description:**

There are ten, 100-ton, triple-hopper railroad cars in the NASA Kennedy Space Center Railroad System that were utilized to carry ballast: NLAX 107, NLAX 108, NLAX 109, NLAX 110, NLAX 111, NLAX 112, NLAX 117, NLAX 118, NLAX 119, and NLAX 180 (KSC-TO 2011). The steel cars are 45' long, 9'-10" wide, and weigh 100 tons. They sit on four axles and have three hoppers with doors. The side sheets are 8'-9" tall. The railcars were used to haul track ballast and other aggregates used in the maintenance of the Kennedy Space Center. All 10 were used in the construction of the Crawlerway, the river rock path orbiters used to travel from the Vehicle Assembly Building to the launch complexes.

NLAX 107, NLAX 108, NLAX 109, and NLAX 117 were wreck-damaged railcars bought from the Pittsburg and Shawmut Railroad Company in Kittanning, Pennsylvania, in May 1991 for a total of \$16,238.74. NLAX 107 was built by Greenville Steel Car Company in December 1973 and had the numbers P&S 372. NASA Railroad employees with EG&G rebuilt the railcar using parts from six other railcars. NLAX 108 was built by Greenville Steel Car Company in January 1974 and had the number P&S 476. NLAX 109 was built in August 1975 by Greenville Steel Car Company and had the number P&S 524 and includes a portion of P&S 319's frame. NLAX 117 was built by Bethlehem Steel in December 1973 and had the number P&S 319. After it was bought by NASA, the car was extensively repaired, which included a rebody kit bought from Norfolk Southern Railroad (KSC-TO, Folder No. 6670-5-107).

NLAX 110, NLAX 111, and NLAX 112 were bought from the Chicago Pacific Corporation in 1984 for \$3,000 each. NLAX 110 was built in the Chicago Rock Island & Pacific Railroad's El Reno, Oklahoma, shop in late 1977 from a kit and had the number Rock 609999; it is the only car of its kind and is the last car built by the Rock Island Railroad. It was in storage from early 1980 to July 1984 until it was purchased by NASA. NLAX 111 and NLAX 112 were built by Greenville Steel Car Company in spring 1979. NLAX 111 was RI 701042, and NLAX 112 was RI 701198. They were under repair when the Chicago Rock Island & Pacific shut down, and they were sold to NASA even though they were under lease from another railroad (KSC-TO, Folder No. 6670-5-109).

NLAX 118 was built by Bethlehem Steel in August 1973. It was damaged when purchased by NASA in February 1991 (KSC-TO, Folder No. 6670-5-118). NLAX 119 was built by Bethlehem Steel in May 1971, and bought by NASA from the Pittsburg and Shawmut Railroad Company in May 1991 (KSC-TO, Folder No. 6670-5-119). NLAX 180 was built in December 1974 (KSC-TO 1987). It was likely purchased and refurbished by NASA shortly before the Crawlerway was rebuilt in the early 1990s.

Bibliographic References:

NASA KSC, Transportation Office (KSC-TO)

- 1987 NASA Railroad Equipment Listing. August 10.
- 1998 Found on Station Equipment Investigation. Folder No. 6670-5-118
- 1998 Found on Station Equipment Investigation. Folder No. 6670-5-119
- 2011 NASA Railroad Equipment Listing. July 21.
- Var. Folder No. 6670-5-107
- Var. Folder No. 6670-5-109
- Var. Folder No. 6670-5-113



PHOTOGRAPHS



NLAX 119, 100-Ton Triple Hopper



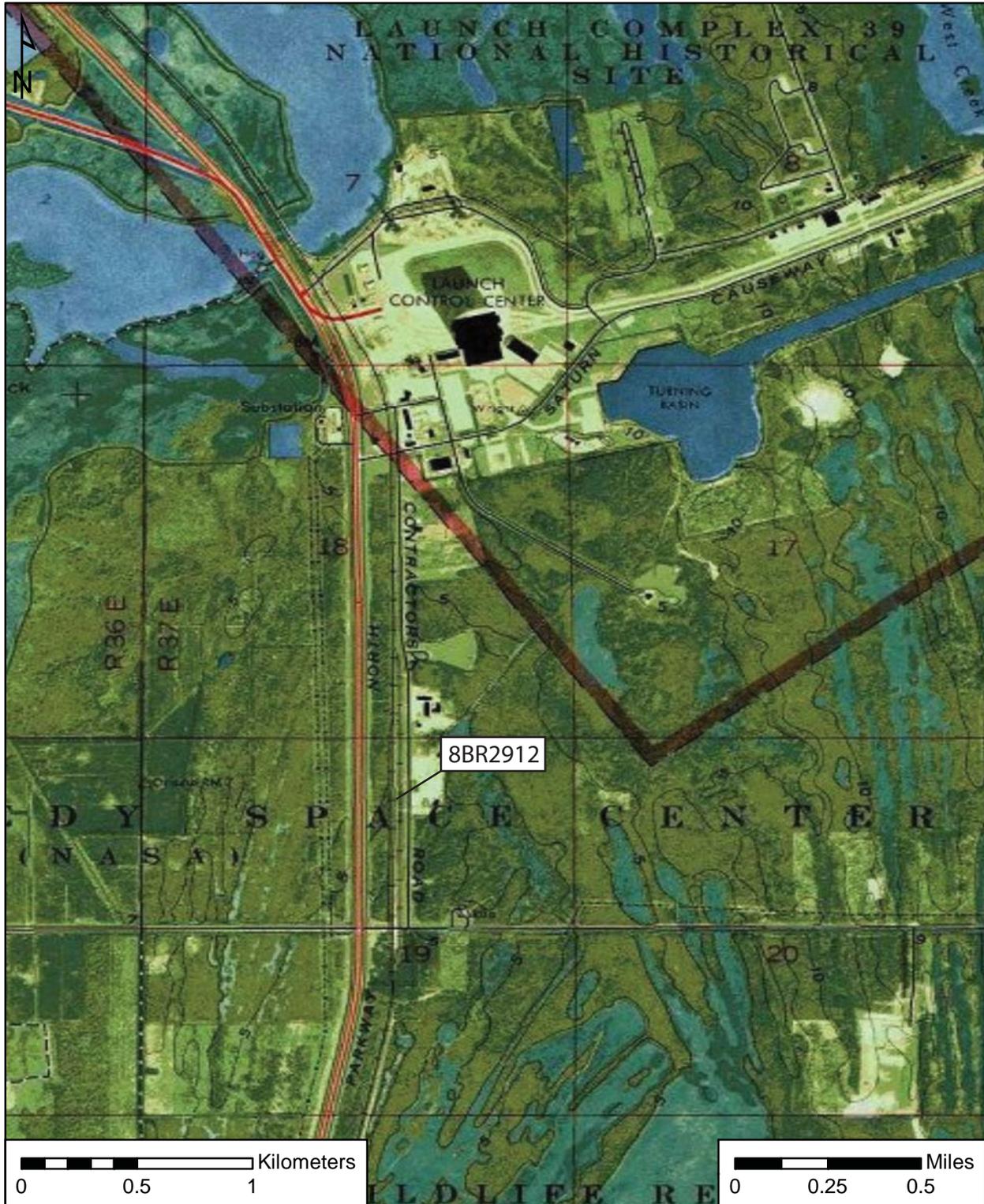
NLAX 111, 100-Ton Triple Hopper



USGS

Orsino

Township 22 South, Range 37 East, Section 19
National Geographic Society (2011) USA Topo Maps.



Original
 Update



HISTORICAL STRUCTURE FORM

FLORIDA MASTER SITE FILE

Version 4.0 1/07

Site #8 **BR02913**
Field Date 1-24-2012
Form Date 2-2-2012
Recorder # 7

Shaded Fields represent the minimum acceptable level of documentation.
Consult the *Guide to Historical Structure Forms* for detailed instructions.

Site Name(s) (address if none) NLAX 153; NLAX 154 Multiple Listing (DHR only) _____
Survey Project Name Historic Evaluation and Survey of Jay Jay Bridge Survey # (DHR only) _____
National Register Category (please check one) building structure district site object
Ownership: private-profit private-nonprofit private-individual private-nonspecific city county state federal Native American foreign unknown

LOCATION & MAPPING

Address: Contractor Street Number _____ Direction _____ Street Name _____ Street Type Road Suffix Direction _____
Cross Streets (nearest / between) Schwartz Road and Saturn Causeway
USGS 7.5 Map Name ORSINO USGS Date 1976 Plat or Other Map _____
City / Town (within 3 miles) Titusville In City Limits? yes no unknown County Brevard
Township 22S Range 37E Section 19 1/4 section: NW SW SE NE Irregular-name: _____
Tax Parcel # not applicable Landgrant _____
Subdivision Name _____ Block _____ Lot _____
UTM Coordinates: Zone 16 17 Easting 533794 Northing 3160101
Other Coordinates: X: _____ Y: _____ Coordinate System & Datum _____
Name of Public Tract (e.g., park) _____

HISTORY

Construction Year: 1960 approximately year listed or earlier year listed or later
Original Use Other From (year): _____ To (year): _____
Current Use Other From (year): _____ To (year): _____
Other Use Railcar From (year): _____ To (year): _____
Moves: yes no unknown Date: _____ Original address _____
Alterations: yes no unknown Date: 1-1-1974 Nature See continuation sheet
Additions: yes no unknown Date: _____ Nature _____
Architect (last name first): _____ Builder (last name first): Pullman Standard
Ownership History (especially original owner, dates, profession, etc.) General Electric Rail Services, 1960-n.d.; Garrett Railroad Car and Equipment Inc., n.d.-1981-82; NASA, 1981-82-present
Is the Resource Affected by a Local Preservation Ordinance? yes no unknown Describe _____

DESCRIPTION

Style Not applicable Exterior Plan Not applicable Number of Stories NA
Exterior Fabric(s) 1. Steel 2. _____ 3. _____
Roof Type(s) 1. _____ 2. _____ 3. _____
Roof Material(s) 1. _____ 2. _____ 3. _____
Roof secondary strucs. (dormers etc.) 1. _____ 2. _____
Windows (types, materials, etc.) _____
Distinguishing Architectural Features (exterior or interior ornaments) _____
Ancillary Features / Outbuildings (record outbuildings, major landscape features; use continuation sheet if needed.) _____

DHR USE ONLY		OFFICIAL EVALUATION		DHR USE ONLY	
NR List Date	SHPO – Appears to meet criteria for NR listing: <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> insufficient info	Date	_____	Init.	_____
<input type="checkbox"/> Owner Objection	KEEPER – Determined eligible: <input type="checkbox"/> yes <input type="checkbox"/> no	Date	_____		
	NR Criteria for Evaluation: <input type="checkbox"/> a <input type="checkbox"/> b <input type="checkbox"/> c <input type="checkbox"/> d (see <i>National Register Bulletin 15</i> , p. 2)				

DESCRIPTION (continued)

Chimney: No. ____ Chimney Material(s): 1. _____ 2. _____
 Structural System(s): 1. _____ 2. _____ 3. _____
 Foundation Type(s): 1. _____ 2. _____
 Foundation Material(s): 1. _____ 2. _____
 Main Entrance (stylistic details) _____

Porch Descriptions (types, locations, roof types, etc.) _____

Condition (overall resource condition): excellent good fair deteriorated ruinous

Narrative Description of Resource See continuation sheet

Archaeological Remains _____ Check if Archaeological Form Completed

RESEARCH METHODS (check all that apply)

FMSF record search (sites/surveys) library research building permits Sanborn maps
 FL State Archives/photo collection city directory occupant/owner interview plat maps
 property appraiser / tax records newspaper files neighbor interview Public Lands Survey (DEP)
 cultural resource survey (CRAS) historic photos interior inspection HABS/HAER record search
 other methods (describe) _____

Bibliographic References (give FMSF manuscript # if relevant, use continuation sheet if needed) See continuation sheet

OPINION OF RESOURCE SIGNIFICANCE

Appears to meet the criteria for National Register listing individually? yes no insufficient information

Appears to meet the criteria for National Register listing as part of a district? yes no insufficient information

Explanation of Evaluation (required, whether significant or not; use separate sheet if needed) Although NASA owns these railcars, they were not a significant contributor to any U.S. manned space program; therefore, they are not considered individually eligible for the NRHP, nor are they considered contributing to the NASA KSC Railroad HD.

Area(s) of Historical Significance (see *National Register Bulletin 15*, p. 8 for categories: e.g. "architecture", "ethnic heritage", "community planning & development", etc.)

1. Other 3. _____ 5. _____
 2. Transportation 4. _____ 6. _____

DOCUMENTATION

Accessible Documentation Not Filed with the Site File - including field notes, analysis notes, photos, plans and other important documents

1) Document type All materials at one location Maintaining organization Archaeological Consultants Inc
 Document description _____ File or accession #'s P9026Q
 2) Document type _____ Maintaining organization _____
 Document description _____ File or accession #'s _____

RECORDER INFORMATION

Recorder Name Christopher Berger Affiliation Archaeological Consultants Inc

Recorder Contact Information 8110 Blaikie Court, Suite A, Sarasota, FL 34240/941-379-6206/ACIFlorida@comcast.net
 (address / phone / fax / e-mail)

Required Attachments

- ① USGS 7.5' MAP WITH STRUCTURE LOCATION PINPOINTED IN RED
- ② LARGE SCALE STREET, PLAT OR PARCEL MAP (available from most property appraiser web sites)
- ③ PHOTO OF MAIN FACADE, ARCHIVAL B&W PRINT OR DIGITAL IMAGE FILE

If submitting an image file, it must be included on disk or CD AND in hard copy format (plain paper is acceptable).
 Digital image must be at least 1600 x 1200 pixels, 24-bit color, jpeg or tiff.

CONTINUATION SHEET**Narrative Description:**

There are two solid rocket motor cover cars within the NASA Kennedy Space Center Railroad System: NLAX 153 and 154. The steel railroad cars are both 87'-4" long and are flanked by three pairs of arms at the front, back, and middle that extend approximately 3' from the car deck. The deck for NLAX 153 is open except for the center cross beam, while the deck for NLAX 154 has built-in fasteners for the SRM covers. There are four axles per car. NLAX 153 and 154 are distinguished by the 7 1/2" lips on the top of the sidesills and railings at both ends.

NLAX 153 and 154 originated as piggyback flat cars built by Pullman-Standard in 1960 for General Electric Rail Services; NLAX 153 was previously NIFX 9206, and NLAX 154 was NIFX 9215. They were rebuilt in 1974 when bi-level auto racks were added to each, but the two railcars were never used to haul vehicles.

NASA purchased NLAX 153 on December 11, 1981, for \$7,394 on Purchase Order CC-1466B from Garrett Railroad Car and Equipment Company, Inc. NASA initially intended to use it as a spacer car, but found it ideal to hold two solid rocket motor segment covers. Modifications were completed by the NASA Railroad staff and cost between \$2,000 and \$3,000. Shortly thereafter, NLAX 154 was also purchased from Garrett for the same price and was also modified (KSC-TO, Folder No. 6670-5-154). On a work order dated November 14, 1983, both railcars were sandblasted for \$953.20 each (KSC-TO, Folder No. 6670-5-90).

Bibliographic References:

NASA KSC, Transportation Office (KSC-TO)

Var. Folder No. 6670-5-090: NLAX 90; Spacer Car

Var. Folder No. 6670-5-154: SRB Spacer Car



PHOTOGRAPHS



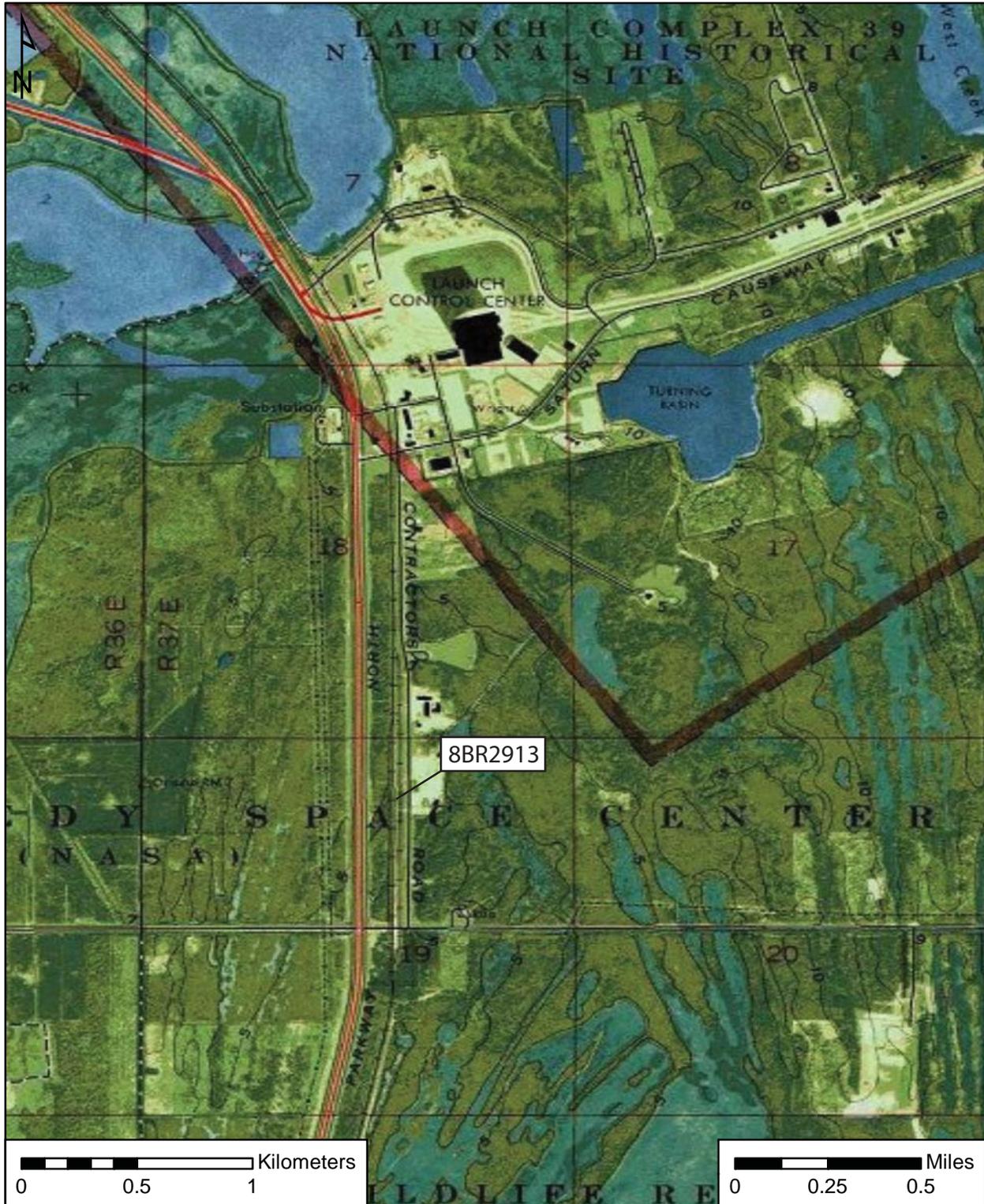
NLAX 154, Cover Car



USGS

Orsino

Township 22 South, Range 37 East, Section 19
National Geographic Society (2011) USA Topo Maps.



Original
 Update



HISTORICAL STRUCTURE FORM

FLORIDA MASTER SITE FILE

Version 4.0 1/07

Site #8 **BR02914**
Field Date 1-24-2012
Form Date 2-14-2012
Recorder # 8

Shaded Fields represent the minimum acceptable level of documentation.
Consult the *Guide to Historical Structure Forms* for detailed instructions.

Site Name(s) (address if none) NLAX 125; NLAX 126; NLAX 127 Multiple Listing (DHR only) _____
Survey Project Name Historic Survey of NASA Railroad System Survey # (DHR only) _____
National Register Category (please check one) building structure district site object
Ownership: private-profit private-nonprofit private-individual private-nonspecific city county state federal Native American foreign unknown

LOCATION & MAPPING

Address: Contractor Street Number _____ Direction _____ Street Name _____ Street Type Road Suffix Direction _____
Cross Streets (nearest / between) Schwartz Road and Saturn Causeway
USGS 7.5 Map Name ORSINO USGS Date 1976 Plat or Other Map _____
City / Town (within 3 miles) Titusville In City Limits? yes no unknown County Brevard
Township 22S Range 37E Section 19 1/4 section: NW SW SE NE Irregular-name: _____
Tax Parcel # Not applicable Landgrant _____
Subdivision Name _____ Block _____ Lot _____
UTM Coordinates: Zone 16 17 Easting 533794 Northing 3160101
Other Coordinates: X: _____ Y: _____ Coordinate System & Datum _____
Name of Public Tract (e.g., park) _____

HISTORY

Construction Year: 1968 approximately year listed or earlier year listed or later
Original Use Other From (year): 1968 To (year): cur
Current Use Other From (year): _____ To (year): _____
Other Use Railcar From (year): _____ To (year): _____
Moves: yes no unknown Date: _____ Original address _____
Alterations: yes no unknown Date: _____ Nature See continuation sheet
Additions: yes no unknown Date: _____ Nature _____
Architect (last name first): _____ Builder (last name first): Thrall Car Manufacturing Co.
Ownership History (especially original owner, dates, profession, etc.) Railmark Inc., unknown-1987; NASA 1987-present

Is the Resource Affected by a Local Preservation Ordinance? yes no unknown Describe _____

DESCRIPTION

Style Not applicable Exterior Plan Not applicable Number of Stories NA
Exterior Fabric(s) 1. Steel 2. _____ 3. _____
Roof Type(s) 1. _____ 2. _____ 3. _____
Roof Material(s) 1. _____ 2. _____ 3. _____
Roof secondary strucs. (dormers etc.) 1. _____ 2. _____
Windows (types, materials, etc.) _____

Distinguishing Architectural Features (exterior or interior ornaments) _____

Ancillary Features / Outbuildings (record outbuildings, major landscape features; use continuation sheet if needed.) _____

DHR USE ONLY		OFFICIAL EVALUATION		DHR USE ONLY	
NR List Date _____	SHPO – Appears to meet criteria for NR listing: <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> insufficient info	Date _____	Init. _____		
<input type="checkbox"/> Owner Objection	KEEPER – Determined eligible: <input type="checkbox"/> yes <input type="checkbox"/> no	Date _____			
	NR Criteria for Evaluation: <input type="checkbox"/> a <input type="checkbox"/> b <input type="checkbox"/> c <input type="checkbox"/> d (see <i>National Register Bulletin 15</i> , p. 2)				

DESCRIPTION (continued)

Chimney: No. _____ Chimney Material(s): 1. _____ 2. _____
 Structural System(s): 1. _____ 2. _____ 3. _____
 Foundation Type(s): 1. _____ 2. _____
 Foundation Material(s): 1. _____ 2. _____
 Main Entrance (stylistic details) _____

Porch Descriptions (types, locations, roof types, etc.) _____

Condition (overall resource condition): excellent good fair deteriorated ruinous

Narrative Description of Resource See continuation sheet

Archaeological Remains _____ Check if Archaeological Form Completed

RESEARCH METHODS (check all that apply)

FMSF record search (sites/surveys) library research building permits Sanborn maps
 FL State Archives/photo collection city directory occupant/owner interview plat maps
 property appraiser / tax records newspaper files neighbor interview Public Lands Survey (DEP)
 cultural resource survey (CRAS) historic photos interior inspection HABS/HAER record search
 other methods (describe) _____

Bibliographic References (give FMSF manuscript # if relevant, use continuation sheet if needed) See continuation sheet

OPINION OF RESOURCE SIGNIFICANCE

Appears to meet the criteria for National Register listing individually? yes no insufficient information

Appears to meet the criteria for National Register listing as part of a district? yes no insufficient information

Explanation of Evaluation (required, whether significant or not; use separate sheet if needed) Although NASA owns these railcars, they were not a significant contributor to any U.S. manned space program; therefore, they are not considered individually eligible for the NRHP, nor are they considered contributing to the NASA KSC Railroad HD.

Area(s) of Historical Significance (see *National Register Bulletin 15*, p. 8 for categories: e.g. "architecture", "ethnic heritage", "community planning & development", etc.)

1. Other 3. _____ 5. _____
 2. Transportation 4. _____ 6. _____

DOCUMENTATION

Accessible Documentation Not Filed with the Site File - including field notes, analysis notes, photos, plans and other important documents

- 1) Document type All materials at one location Maintaining organization Archaeological Consultants Inc
 Document description _____ File or accession #'s P9026Q
- 2) Document type _____ Maintaining organization _____
 Document description _____ File or accession #'s _____

RECORDER INFORMATION

Recorder Name Christopher Berger Affiliation Archaeological Consultants Inc

Recorder Contact Information 8110 Blaikie Court, Suite A, Sarasota, FL 34240/941-379-6206/ACIFlorida@comcast.net
 (address / phone / fax / e-mail)

Required Attachments

- ① USGS 7.5' MAP WITH STRUCTURE LOCATION PINPOINTED IN RED
- ② LARGE SCALE STREET, PLAT OR PARCEL MAP (available from most property appraiser web sites)
- ③ PHOTO OF MAIN FACADE, ARCHIVAL B&W PRINT OR DIGITAL IMAGE FILE

If submitting an image file, it must be included on disk or CD AND in hard copy format (plain paper is acceptable).
 Digital image must be at least 1600 x 1200 pixels, 24-bit color, jpeg or tiff.

CONTINUATION SHEET**Narrative Description:**

NLAX 125, NLAX 126, and NLAX 127 are 100-ton, 60'-flat railroad cars within the NASA Kennedy Space Center Railroad System. They are all steel flatcars with cushioned underframes (KSC-TO 1987). NLAX 125 has built-in racks to hold equipment and appears to have been modified. NLAX 126 and NLAX 127 have four pairs of supports evenly spaced across the deck. NLAX 125's deck contains what appears to be industrial equipment, while the decks of NLAX 126 and NLAX 127 are open. All three cars were built in 1968 by Thrall Car Manufacturing Company and had the numbers JHTX 1003, 1004, and 1012. They were purchased for \$16,500 in 1987 from Railmark Inc. of Madeira Beach, Florida (KSC-TO, Folder No. 6670-5-125).

Bibliographic References:

NASA KSC, Transportation Office (KSC-TO)
1987 NASA Railroad Equipment Listing. August 10.
Var. Folder No. 6670-5-125



PHOTOGRAPHS



NLAX 127, 100-Ton, 60-Foot Flat



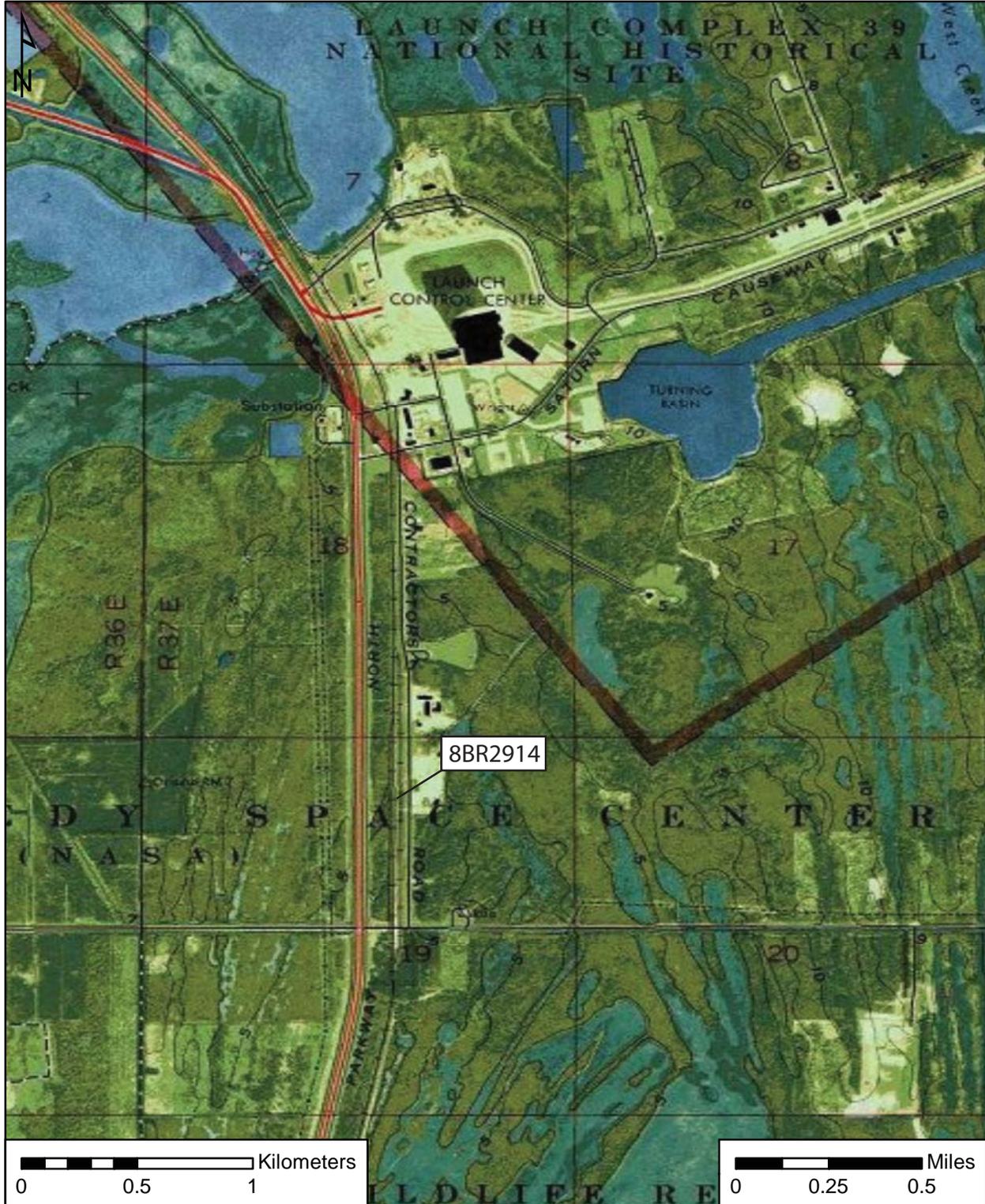
NLAX 125, 100-Ton, 60-Foot Flat



USGS

Orsino

Township 22 South, Range 37 East, Section 19
National Geographic Society (2011) *USA Topo Maps*.



Original
 Update



HISTORICAL STRUCTURE FORM

FLORIDA MASTER SITE FILE

Version 4.0 1/07

Site #8 **BR02915**
Field Date 1-24-2012
Form Date 2-15-2012
Recorder # 9

Shaded Fields represent the minimum acceptable level of documentation.
Consult the *Guide to Historical Structure Forms* for detailed instructions.

Site Name(s) (address if none) NLAX 141; NLAX 142 Multiple Listing (DHR only) _____
Survey Project Name Historic Survey of NASA Railroad System Survey # (DHR only) _____
National Register Category (please check one) building structure district site object
Ownership: private-profit private-nonprofit private-individual private-nonspecific city county state federal Native American foreign unknown

LOCATION & MAPPING

Address: Contractor Street Number _____ Direction _____ Street Name _____ Street Type _____ Suffix Direction _____
Cross Streets (nearest / between) Schwartz Road and Saturn Causeway
USGS 7.5 Map Name ORSINO USGS Date 1976 Plat or Other Map _____
City / Town (within 3 miles) Titusville In City Limits? yes no unknown County Brevard
Township 22S Range 37E Section 19 1/4 section: NW SW SE NE Irregular-name: _____
Tax Parcel # Not applicable Landgrant _____
Subdivision Name _____ Block _____ Lot _____
UTM Coordinates: Zone 16 17 Easting 533794 Northing 3160101
Other Coordinates: X: _____ Y: _____ Coordinate System & Datum _____
Name of Public Tract (e.g., park) _____

HISTORY

Construction Year: 1968 approximately year listed or earlier year listed or later
Original Use Other From (year): 1968 To (year): curr
Current Use Other From (year): _____ To (year): _____
Other Use Railcar From (year): _____ To (year): _____
Moves: yes no unknown Date: _____ Original address _____
Alterations: yes no unknown Date: _____ Nature _____
Additions: yes no unknown Date: _____ Nature _____
Architect (last name first): _____ Builder (last name first): See continuation sheet
Ownership History (especially original owner, dates, profession, etc.) See continuation sheet

Is the Resource Affected by a Local Preservation Ordinance? yes no unknown Describe _____

DESCRIPTION

Style Not applicable Exterior Plan Not applicable Number of Stories NA
Exterior Fabric(s) 1. Steel 2. _____ 3. _____
Roof Type(s) 1. _____ 2. _____ 3. _____
Roof Material(s) 1. _____ 2. _____ 3. _____
Roof secondary strucs. (dormers etc.) 1. _____ 2. _____
Windows (types, materials, etc.) _____

Distinguishing Architectural Features (exterior or interior ornaments) _____

Ancillary Features / Outbuildings (record outbuildings, major landscape features; use continuation sheet if needed.) _____

DHR USE ONLY		OFFICIAL EVALUATION		DHR USE ONLY	
NR List Date _____	SHPO – Appears to meet criteria for NR listing: <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> insufficient info	Date _____	Init. _____		
<input type="checkbox"/> Owner Objection	KEEPER – Determined eligible: <input type="checkbox"/> yes <input type="checkbox"/> no	Date _____			
	NR Criteria for Evaluation: <input type="checkbox"/> a <input type="checkbox"/> b <input type="checkbox"/> c <input type="checkbox"/> d (see <i>National Register Bulletin 15</i> , p. 2)				

DESCRIPTION (continued)

Chimney: No. ____ Chimney Material(s): 1. _____ 2. _____
 Structural System(s): 1. _____ 2. _____ 3. _____
 Foundation Type(s): 1. _____ 2. _____
 Foundation Material(s): 1. _____ 2. _____
 Main Entrance (stylistic details) _____

Porch Descriptions (types, locations, roof types, etc.) _____

Condition (overall resource condition): excellent good fair deteriorated ruinous

Narrative Description of Resource See continuation sheet

Archaeological Remains _____ Check if Archaeological Form Completed

RESEARCH METHODS (check all that apply)

FMSF record search (sites/surveys) library research building permits Sanborn maps
 FL State Archives/photo collection city directory occupant/owner interview plat maps
 property appraiser / tax records newspaper files neighbor interview Public Lands Survey (DEP)
 cultural resource survey (CRAS) historic photos interior inspection HABS/HAER record search
 other methods (describe) _____

Bibliographic References (give FMSF manuscript # if relevant, use continuation sheet if needed) See continuation sheet

OPINION OF RESOURCE SIGNIFICANCE

Appears to meet the criteria for National Register listing individually? yes no insufficient information

Appears to meet the criteria for National Register listing as part of a district? yes no insufficient information

Explanation of Evaluation (required, whether significant or not; use separate sheet if needed) Although NASA owns these railcars, they were not a significant contributor to any U.S. manned space program; therefore, they are not considered individually eligible for the NRHP, nor are they considered contributing to the NASA KSC Railroad HD.

Area(s) of Historical Significance (see *National Register Bulletin 15*, p. 8 for categories: e.g. "architecture", "ethnic heritage", "community planning & development", etc.)

1. Other 3. _____ 5. _____
 2. Transportation 4. _____ 6. _____

DOCUMENTATION

Accessible Documentation Not Filed with the Site File - including field notes, analysis notes, photos, plans and other important documents

1) Document type All materials at one location Maintaining organization Archaeological Consultants Inc
 Document description _____ File or accession #'s P9026Q
 2) Document type _____ Maintaining organization _____
 Document description _____ File or accession #'s _____

RECORDER INFORMATION

Recorder Name Christopher Berger Affiliation Archaeological Consultants Inc

Recorder Contact Information 8110 Blaikie Court, Suite A, Sarasota, FL 34240/941-379-6206/ACIFlorida@comcast.net
 (address / phone / fax / e-mail)

Required Attachments

- ① USGS 7.5' MAP WITH STRUCTURE LOCATION PINPOINTED IN RED
- ② LARGE SCALE STREET, PLAT OR PARCEL MAP (available from most property appraiser web sites)
- ③ PHOTO OF MAIN FACADE, ARCHIVAL B&W PRINT OR DIGITAL IMAGE FILE

If submitting an image file, it must be included on disk or CD AND in hard copy format (plain paper is acceptable).
 Digital image must be at least 1600 x 1200 pixels, 24-bit color, jpeg or tiff.

CONTINUATION SHEET**Narrative Description:**

There are two, 70-ton pig flat railroad cars within NASA Kennedy Space Center Railroad System: NLAX 141 and NLAX 142. Each steel car is 89' long and rest on four axles. They possess low sidesills and have a bridge plate at one end. The cars were designed to transport trailers, so NLAX 141 has a ridge on its deck toward the center plate and another in the middle, while NLAX 142 has ridges at its ends and middle to keep wheels in place.

NLAX 141 likely was built by Bethlehem in 1968 and was owned by the Chicago-based Trailer Train Company with the numbers TTX 602325. NASA bought it at an unknown date. NLAX 142 was owned by the Richmond, Fredericksburg, and Potomac Railroad and had the numbers RF&P 501 (KSC-TO 1987). It was purchased by NASA in January 1989 for \$6,100 and repaired and repainted. It was bought to transport Space Shuttle Program ground support equipment to a contingency landing site should the need arise (KSC-TO, Folder No. 6670-5-142).

Bibliographic References:

NASA KSC, Transportation Office (KSC-TO)

1987 NASA Railroad Equipment Listing. August 10.

2011 NASA Railroad Equipment Listing. July 21.

Var. Folder No. 6670-5-142: NLAX 142; 89 Foot Trailers Car



PHOTOGRAPHS



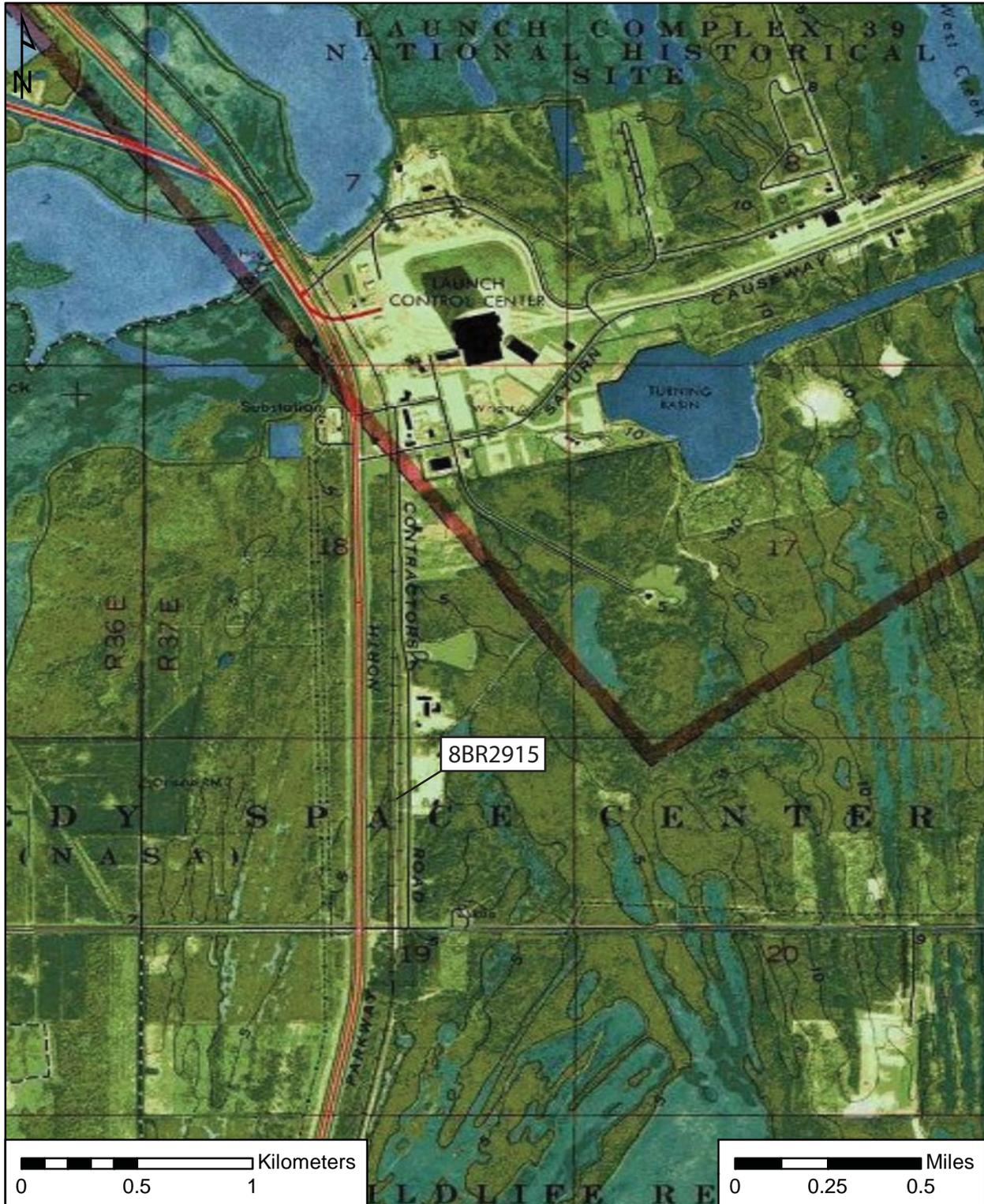
NLAX 142, 70-Ton, 89-Foot Pig Flat



USGS

Orsino

Township 22 South, Range 37 East, Section 19
National Geographic Society (2011) *USA Topo Maps*.



Original
 Update



HISTORICAL STRUCTURE FORM

FLORIDA MASTER SITE FILE

Version 4.0 1/07

Site #8 **BR02916**
Field Date 1-24-2012
Form Date 2-15-2012
Recorder # 10

Shaded Fields represent the minimum acceptable level of documentation.
Consult the *Guide to Historical Structure Forms* for detailed instructions.

Site Name(s) (address if none) NLAX 42-51, 35815, 35819, 35851, 35856 Multiple Listing (DHR only) _____
Survey Project Name Historic Survey of NASA Railroad System Survey # (DHR only) _____
National Register Category (please check one) building structure district site object
Ownership: private-profit private-nonprofit private-individual private-nonspecific city county state federal Native American foreign unknown

LOCATION & MAPPING

Address: Contractor Street Number _____ Direction _____ Street Name _____ Street Type Road Suffix Direction _____
Cross Streets (nearest / between) Schwartz Road and Saturn Causeway
USGS 7.5 Map Name ORSINO USGS Date 1976 Plat or Other Map _____
City / Town (within 3 miles) Titusville In City Limits? yes no unknown County Brevard
Township 22S Range 37E Section 19 1/4 section: NW SW SE NE Irregular-name: _____
Tax Parcel # Not applicable Landgrant _____
Subdivision Name _____ Block _____ Lot _____
UTM Coordinates: Zone 16 17 Easting 533794 Northing 3160101
Other Coordinates: X: _____ Y: _____ Coordinate System & Datum _____
Name of Public Tract (e.g., park) _____

HISTORY

Construction Year: 1950 approximately year listed or earlier year listed or later
Original Use Other From (year): 1950 To (year): cur
Current Use Other From (year): _____ To (year): _____
Other Use Railcar From (year): _____ To (year): _____
Moves: yes no unknown Date: _____ Original address _____
Alterations: yes no unknown Date: _____ Nature _____
Additions: yes no unknown Date: _____ Nature _____
Architect (last name first): _____ Builder (last name first): Pressed Steel Car Company
Ownership History (especially original owner, dates, profession, etc.) U.S. Air Force, 1950s-1990s; NASA, 1990s-present

Is the Resource Affected by a Local Preservation Ordinance? yes no unknown Describe _____

DESCRIPTION

Style Not applicable Exterior Plan Not applicable Number of Stories NA
Exterior Fabric(s) 1. Steel 2. _____ 3. _____
Roof Type(s) 1. _____ 2. _____ 3. _____
Roof Material(s) 1. _____ 2. _____ 3. _____
Roof secondary strucs. (dormers etc.) 1. _____ 2. _____
Windows (types, materials, etc.) _____

Distinguishing Architectural Features (exterior or interior ornaments) _____

Ancillary Features / Outbuildings (record outbuildings, major landscape features; use continuation sheet if needed.) _____

DHR USE ONLY		OFFICIAL EVALUATION		DHR USE ONLY	
NR List Date _____	SHPO – Appears to meet criteria for NR listing: <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> insufficient info	Date _____	Init. _____		
<input type="checkbox"/> Owner Objection	KEEPER – Determined eligible: <input type="checkbox"/> yes <input type="checkbox"/> no	Date _____			
	NR Criteria for Evaluation: <input type="checkbox"/> a <input type="checkbox"/> b <input type="checkbox"/> c <input type="checkbox"/> d (see <i>National Register Bulletin 15</i> , p. 2)				

DESCRIPTION (continued)

Chimney: No. ____ Chimney Material(s): 1. _____ 2. _____
 Structural System(s): 1. _____ 2. _____ 3. _____
 Foundation Type(s): 1. _____ 2. _____
 Foundation Material(s): 1. _____ 2. _____
 Main Entrance (stylistic details) _____

Porch Descriptions (types, locations, roof types, etc.) _____

Condition (overall resource condition): excellent good fair deteriorated ruinous

Narrative Description of Resource See continuation sheet

Archaeological Remains _____ Check if Archaeological Form Completed

RESEARCH METHODS (check all that apply)

FMSF record search (sites/surveys) library research building permits Sanborn maps
 FL State Archives/photo collection city directory occupant/owner interview plat maps
 property appraiser / tax records newspaper files neighbor interview Public Lands Survey (DEP)
 cultural resource survey (CRAS) historic photos interior inspection HABS/HAER record search
 other methods (describe) _____

Bibliographic References (give FMSF manuscript # if relevant, use continuation sheet if needed) See continuation sheet

OPINION OF RESOURCE SIGNIFICANCE

Appears to meet the criteria for National Register listing individually? yes no insufficient information

Appears to meet the criteria for National Register listing as part of a district? yes no insufficient information

Explanation of Evaluation (required, whether significant or not; use separate sheet if needed) Although NASA owns these railcars, they were not a significant contributor to any U.S. manned space program; therefore, they are not considered individually eligible for the NRHP, nor are they considered contributing to the NASA KSC Railroad HD.

Area(s) of Historical Significance (see *National Register Bulletin 15*, p. 8 for categories: e.g. "architecture", "ethnic heritage", "community planning & development", etc.)

1. Other 3. _____ 5. _____
 2. Transportation 4. _____ 6. _____

DOCUMENTATION

Accessible Documentation Not Filed with the Site File - including field notes, analysis notes, photos, plans and other important documents

1) Document type All materials at one location Maintaining organization Archaeological Consultants Inc
 Document description _____ File or accession #'s P9026Q
 2) Document type _____ Maintaining organization _____
 Document description _____ File or accession #'s _____

RECORDER INFORMATION

Recorder Name Christopher Berger Affiliation Archaeological Consultants Inc

Recorder Contact Information 8110 Blaikie Court, Suite A, Sarasota, FL 34240/941-379-6206/ACIFlorida@comcast.net
 (address / phone / fax / e-mail)

Required Attachments

- ① USGS 7.5' MAP WITH STRUCTURE LOCATION PINPOINTED IN RED
- ② LARGE SCALE STREET, PLAT OR PARCEL MAP (available from most property appraiser web sites)
- ③ PHOTO OF MAIN FACADE, ARCHIVAL B&W PRINT OR DIGITAL IMAGE FILE

If submitting an image file, it must be included on disk or CD AND in hard copy format (plain paper is acceptable).
 Digital image must be at least 1600 x 1200 pixels, 24-bit color, jpeg or tiff.

CONTINUATION SHEET**Narrative Description:**

There are fourteen, 100-ton flat railroad cars within the NASA Kennedy Space Center Railroad System: NLAX 42, NLAX 43, NLAX 44, NLAX 45, NLAX 46, NLAX 47, NLAX 48, NLAX 49, NLAX 50, NLAX 51, AF 35815, AF 35819, AF 35851, and AF 35856 (KSC-TO 2011). The 56'-6" long flatcars rest on the six axles and two trucks. Decks vary among the fourteen railcars: some have unobstructed steel decks, while fittings have been added to others to hold specific equipment. A few decks are wood, so nails could be used to secure items to the deck (Stephens 2012).

The railcars were built by the Pressed Steel Car Company in the early- to mid- 1950s for the United States Air Force for use in support of the Titan missile program, which lasted from the mid-1960s to the late 1980s (Hoffman 2012). The cars originally weighed 80 tons and had a weight capacity of 90 tons, but two axles were added to each car to increase the limit (Stephens 2012). NLAX 44, NLAX 48, and NLAX 49—have been designated as spacer cars. Records show NLAX 41 and NLAX 42 were purchased for \$41,856 at an unknown date (KSC-TO 2011). NASA acquired the cars in the 1990s after the Titan program ended (Hoffman 2012).

Bibliographic References:

Hoffman, Dave (retired NASA Railroad Manager).

2012 Interview by Christopher Berger and Patricia Slovinac, February 27. Notes on file at Archaeological Consultants, Inc.

NASA KSC, Transportation Office (KSC-TO)

2011 NASA Railroad Equipment Listing. July 21.

Stephens, Mike (KSC Railroad technician).

2012 Interview by Christopher Berger, January 26. Notes on file at Archaeological Consultants, Inc.



PHOTOGRAPHS



NLAX 42, 100-Ton Flat



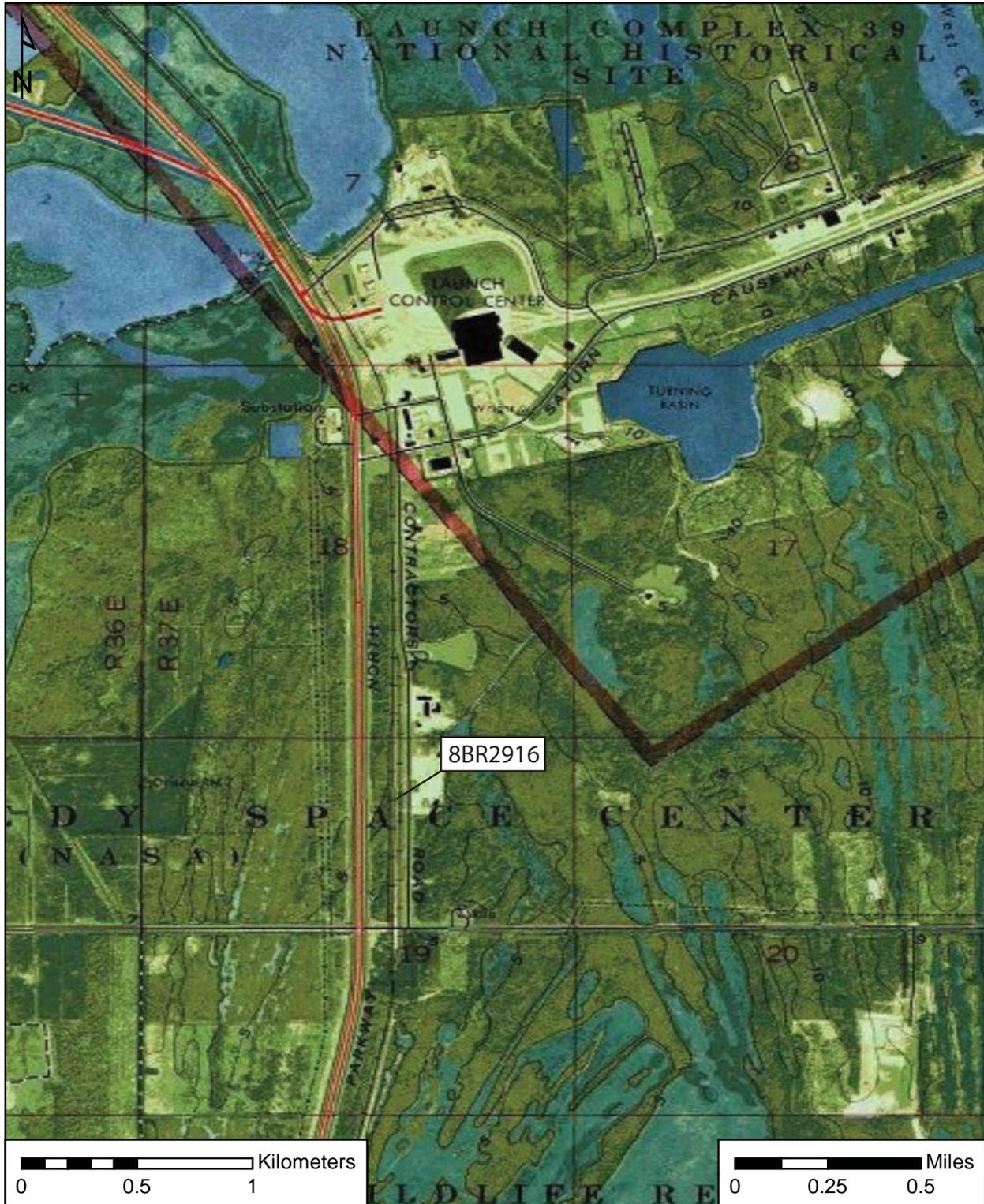
Tag Detail



USGS

Orsino

Township 22 South, Range 37 East, Section 19
National Geographic Society (2011) *USA Topo Maps*.



Original
 Update



HISTORICAL STRUCTURE FORM

FLORIDA MASTER SITE FILE

Version 4.0 1/07

Site #8 **BR02917**
Field Date 1-24-2012
Form Date 2-15-2012
Recorder # 11

Shaded Fields represent the minimum acceptable level of documentation.
Consult the *Guide to Historical Structure Forms* for detailed instructions.

Site Name(s) (address if none) NLAX 175; NLAX 176 Multiple Listing (DHR only) _____
Survey Project Name Historic Survey of NASA Railroad System Survey # (DHR only) _____
National Register Category (please check one) building structure district site object
Ownership: private-profit private-nonprofit private-individual private-nonspecific city county state federal Native American foreign unknown

LOCATION & MAPPING

Address: Contractor Street Number _____ Direction _____ Street Name _____ Street Type Road Suffix Direction _____
Cross Streets (nearest / between) Schwartz Road and Saturn Causeway
USGS 7.5 Map Name ORSINO USGS Date 1976 Plat or Other Map _____
City / Town (within 3 miles) Titusville In City Limits? yes no unknown County Brevard
Township 22S Range 37E Section 19 1/4 section: NW SW SE NE Irregular-name: _____
Tax Parcel # Not applicable Landgrant _____
Subdivision Name _____ Block _____ Lot _____
UTM Coordinates: Zone 16 17 Easting 533794 Northing 3160101
Other Coordinates: X: _____ Y: _____ Coordinate System & Datum _____
Name of Public Tract (e.g., park) _____

HISTORY

Construction Year: 1966 approximately year listed or earlier year listed or later
Original Use Other From (year): 1966 To (year): curr
Current Use Other From (year): _____ To (year): _____
Other Use Railcar From (year): _____ To (year): _____
Moves: yes no unknown Date: _____ Original address _____
Alterations: yes no unknown Date: 1-1-1985 Nature Rebuilt to hold solid rock motor rings
Additions: yes no unknown Date: _____ Nature _____
Architect (last name first): _____ Builder (last name first): Ortner
Ownership History (especially original owner, dates, profession, etc.) Rock Island, unknown-1984; NASA 1984-present

Is the Resource Affected by a Local Preservation Ordinance? yes no unknown Describe _____

DESCRIPTION

Style Not applicable Exterior Plan Not applicable Number of Stories NA
Exterior Fabric(s) 1. Steel 2. _____ 3. _____
Roof Type(s) 1. _____ 2. _____ 3. _____
Roof Material(s) 1. _____ 2. _____ 3. _____
Roof secondary strucs. (dormers etc.) 1. _____ 2. _____
Windows (types, materials, etc.) _____

Distinguishing Architectural Features (exterior or interior ornaments) _____

Ancillary Features / Outbuildings (record outbuildings, major landscape features; use continuation sheet if needed.) _____

DHR USE ONLY		OFFICIAL EVALUATION	DHR USE ONLY	
NR List Date	SHPO – Appears to meet criteria for NR listing: <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> insufficient info	Date _____	Init. _____	
<input type="checkbox"/> Owner Objection	KEEPER – Determined eligible: <input type="checkbox"/> yes <input type="checkbox"/> no	Date _____		
	NR Criteria for Evaluation: <input type="checkbox"/> a <input type="checkbox"/> b <input type="checkbox"/> c <input type="checkbox"/> d (see <i>National Register Bulletin 15</i> , p. 2)			

DESCRIPTION (continued)

Chimney: No. ____ Chimney Material(s): 1. _____ 2. _____
 Structural System(s): 1. _____ 2. _____ 3. _____
 Foundation Type(s): 1. _____ 2. _____
 Foundation Material(s): 1. _____ 2. _____
 Main Entrance (stylistic details) _____

Porch Descriptions (types, locations, roof types, etc.) _____

Condition (overall resource condition): excellent good fair deteriorated ruinous

Narrative Description of Resource See continuation sheet

Archaeological Remains _____ Check if Archaeological Form Completed

RESEARCH METHODS (check all that apply)

FMSF record search (sites/surveys) library research building permits Sanborn maps
 FL State Archives/photo collection city directory occupant/owner interview plat maps
 property appraiser / tax records newspaper files neighbor interview Public Lands Survey (DEP)
 cultural resource survey (CRAS) historic photos interior inspection HABS/HAER record search
 other methods (describe) _____

Bibliographic References (give FMSF manuscript # if relevant, use continuation sheet if needed) See continuation sheet

OPINION OF RESOURCE SIGNIFICANCE

Appears to meet the criteria for National Register listing individually? yes no insufficient information

Appears to meet the criteria for National Register listing as part of a district? yes no insufficient information

Explanation of Evaluation (required, whether significant or not; use separate sheet if needed) Although NASA owns these railcars, they were not a significant contributor to any U.S. manned space program; therefore, they are not considered individually eligible for the NR, nor are they considered contributing to the NASA KSC Railroad HD.

Area(s) of Historical Significance (see *National Register Bulletin 15*, p. 8 for categories: e.g. "architecture", "ethnic heritage", "community planning & development", etc.)

1. Other 3. _____ 5. _____
 2. Transportation 4. _____ 6. _____

DOCUMENTATION

Accessible Documentation Not Filed with the Site File - including field notes, analysis notes, photos, plans and other important documents

1) Document type All materials at one location Maintaining organization Archaeological Consultants Inc
 Document description _____ File or accession #'s P9026Q
 2) Document type _____ Maintaining organization _____
 Document description _____ File or accession #'s _____

RECORDER INFORMATION

Recorder Name Christopher Berger Affiliation Archaeological Consultants Inc

Recorder Contact Information 8110 Blaikie Court, Suite A, Sarasota, FL 34240/941-379-6206/ACIFlorida@comcast.net
 (address / phone / fax / e-mail)

Required Attachments

- ① USGS 7.5' MAP WITH STRUCTURE LOCATION PINPOINTED IN RED
- ② LARGE SCALE STREET, PLAT OR PARCEL MAP (available from most property appraiser web sites)
- ③ PHOTO OF MAIN FACADE, ARCHIVAL B&W PRINT OR DIGITAL IMAGE FILE

If submitting an image file, it must be included on disk or CD AND in hard copy format (plain paper is acceptable).
 Digital image must be at least 1600 x 1200 pixels, 24-bit color, jpeg or tiff.

CONTINUATION SHEET**Narrative Description:**

NLAX 175 and NLAX 176 are 60' gondola railroad cars within the NASA Kennedy Space Center Railroad System (KSC-TO 2011). They were used to transport solid rocket motor end rings in support of the Space Shuttle Program (KSC-TO 1985). The steel cars rest on four axles with a cushioned underframe and had a weight capacity of 93,000 pounds. The cars originated with wood floors, which were replaced by 3/16" steel plates; the cars are 10'-8" wide and have side sheets 3'-8" tall. There is room for three removable SRM end ring racks.

NLAX 175 and NLAX 176 were built by Ortner in 1966 and were the property of the Rock Island Railroad with the numbers RI 3876 and RI 3895. NASA bought them for \$3,000 each in late 1984 from the Chicago Pacific Corp., formerly the Rock Island Railroad. NASA Railroad mechanics reduced the cars' weight from 100 tons to 70 tons by adding new centerplates and rebuilt trucks (KSC-TO, Folder No. 6670-5-175).

Bibliographic References:

NASA KSC, Transportation Office (KSC-TO)

1985 NASA Railroad Car Data Sheet.

2011 NASA Railroad Equipment Listing. July 21.

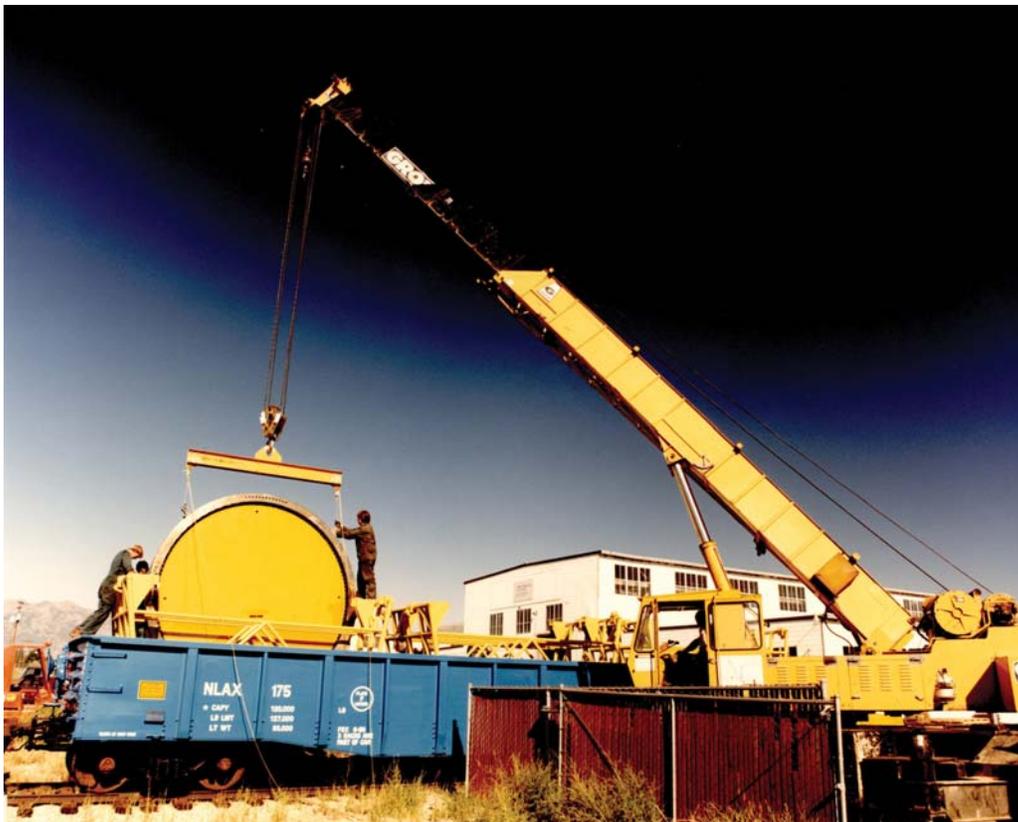
Var. Folder No. 6670-5-175; NLAX 175 End Ring Rack Car; 70 Ton, 10 Inch EOC; Formerly RI 3876.



PHOTOGRAPHS



NLAX 175, 60-Foot Gondola



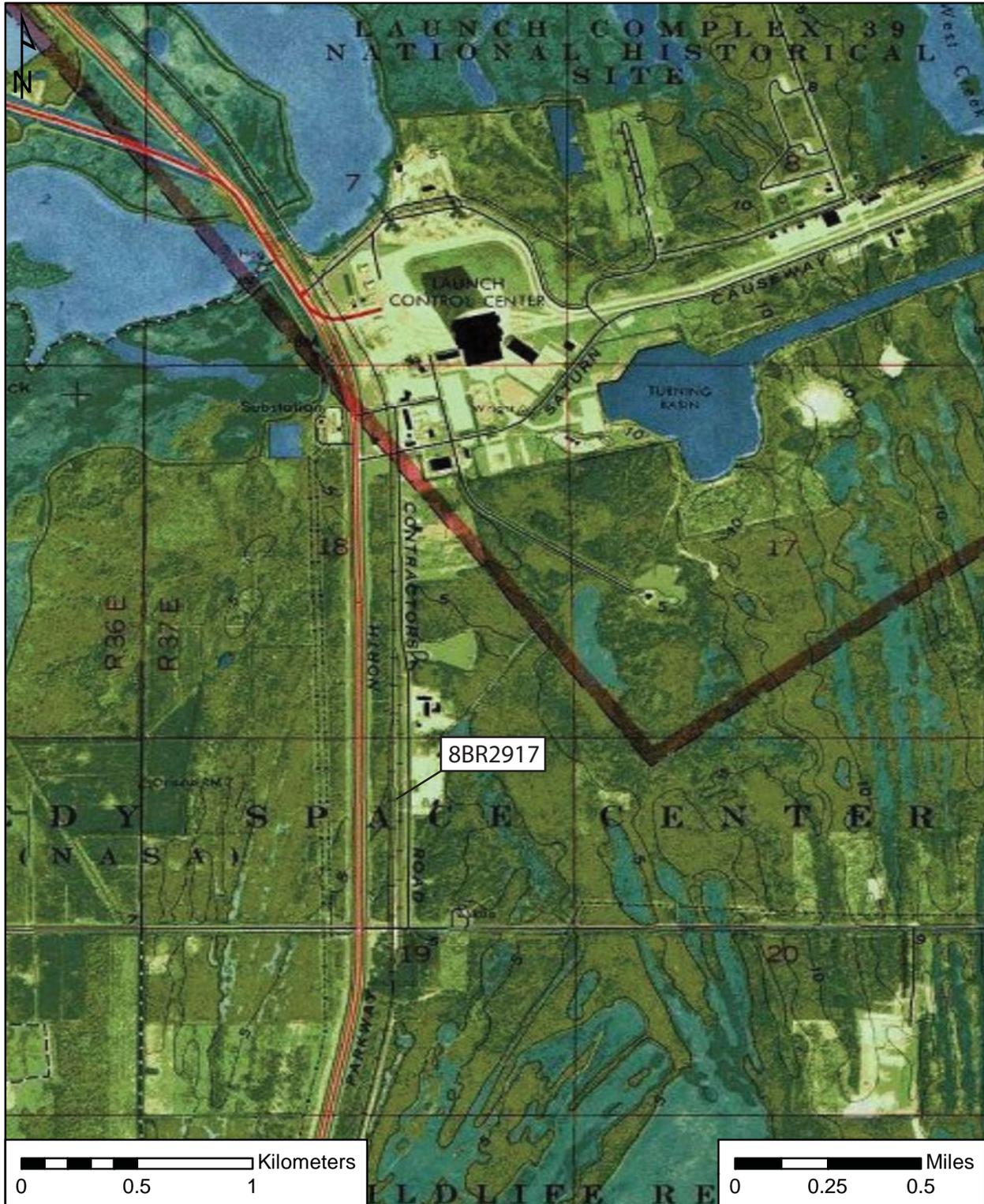
NLAX 175, 60-Foot Gondola (KSC 87433-1)



USGS

Orsino

Township 22 South, Range 37 East, Section 19
National Geographic Society (2011) USA Topo Maps.



Original
 Update



HISTORICAL STRUCTURE FORM

FLORIDA MASTER SITE FILE

Version 4.0 1/07

Site #8 **BR02918**
Field Date 1-24-2012
Form Date 2-15-2012
Recorder # 12

Shaded Fields represent the minimum acceptable level of documentation.
Consult the *Guide to Historical Structure Forms* for detailed instructions.

Site Name(s) (address if none) NLAX 4005 Multiple Listing (DHR only) _____
Survey Project Name Historic Survey of NASA Railroad System Survey # (DHR only) _____
National Register Category (please check one) building structure district site object
Ownership: private-profit private-nonprofit private-individual private-nonspecific city county state federal Native American foreign unknown

LOCATION & MAPPING

Address: Contractor Street Number _____ Direction _____ Street Name _____ Street Type Road Suffix Direction _____
Cross Streets (nearest / between) Schwartz Road and Saturn Causeway
USGS 7.5 Map Name ORSINO USGS Date 1976 Plat or Other Map _____
City / Town (within 3 miles) Titusville In City Limits? yes no unknown County Brevard
Township 22S Range 37E Section 19 1/4 section: NW SW SE NE Irregular-name: _____
Tax Parcel # Not applicable Landgrant _____
Subdivision Name _____ Block _____ Lot _____
UTM Coordinates: Zone 16 17 Easting 533794 Northing 3160101
Other Coordinates: X: _____ Y: _____ Coordinate System & Datum _____
Name of Public Tract (e.g., park) _____

HISTORY

Construction Year: 1970 approximately year listed or earlier year listed or later
Original Use Other From (year): 1970 To (year): curr
Current Use Other From (year): _____ To (year): _____
Other Use Railcar From (year): _____ To (year): _____
Moves: yes no unknown Date: _____ Original address _____
Alterations: yes no unknown Date: _____ Nature _____
Additions: yes no unknown Date: _____ Nature _____
Architect (last name first): _____ Builder (last name first): American Car and Foundry Co.
Ownership History (especially original owner, dates, profession, etc.) Chicago Pacific Corp., unknown-1985; NASA 1985-present

Is the Resource Affected by a Local Preservation Ordinance? yes no unknown Describe _____

DESCRIPTION

Style Not applicable Exterior Plan Not applicable Number of Stories NA
Exterior Fabric(s) 1. Steel 2. _____ 3. _____
Roof Type(s) 1. _____ 2. _____ 3. _____
Roof Material(s) 1. _____ 2. _____ 3. _____
Roof secondary strucs. (dormers etc.) 1. _____ 2. _____
Windows (types, materials, etc.) _____

Distinguishing Architectural Features (exterior or interior ornaments) _____

Ancillary Features / Outbuildings (record outbuildings, major landscape features; use continuation sheet if needed.) _____

DHR USE ONLY		OFFICIAL EVALUATION		DHR USE ONLY	
NR List Date _____	SHPO – Appears to meet criteria for NR listing: <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> insufficient info	Date _____	Init. _____		
<input type="checkbox"/> Owner Objection	KEEPER – Determined eligible: <input type="checkbox"/> yes <input type="checkbox"/> no	Date _____			
	NR Criteria for Evaluation: <input type="checkbox"/> a <input type="checkbox"/> b <input type="checkbox"/> c <input type="checkbox"/> d (see <i>National Register Bulletin 15</i> , p. 2)				

DESCRIPTION (continued)

Chimney: No. ____ Chimney Material(s): 1. _____ 2. _____
 Structural System(s): 1. _____ 2. _____ 3. _____
 Foundation Type(s): 1. _____ 2. _____
 Foundation Material(s): 1. _____ 2. _____
 Main Entrance (stylistic details) _____

Porch Descriptions (types, locations, roof types, etc.) _____

Condition (overall resource condition): excellent good fair deteriorated ruinous

Narrative Description of Resource See continuation sheet

Archaeological Remains _____ Check if Archaeological Form Completed

RESEARCH METHODS (check all that apply)

FMSF record search (sites/surveys) library research building permits Sanborn maps
 FL State Archives/photo collection city directory occupant/owner interview plat maps
 property appraiser / tax records newspaper files neighbor interview Public Lands Survey (DEP)
 cultural resource survey (CRAS) historic photos interior inspection HABS/HAER record search
 other methods (describe) _____

Bibliographic References (give FMSF manuscript # if relevant, use continuation sheet if needed) See continuation sheet

OPINION OF RESOURCE SIGNIFICANCE

Appears to meet the criteria for National Register listing individually? yes no insufficient information

Appears to meet the criteria for National Register listing as part of a district? yes no insufficient information

Explanation of Evaluation (required, whether significant or not; use separate sheet if needed) Although NASA owns this railcar, it was not a significant contributor to any U.S. manned space program; therefore, it is not considered individually eligible for the NRHP, nor is it considered a contributing resource to the NASA KSC Railroad HD.

Area(s) of Historical Significance (see *National Register Bulletin 15*, p. 8 for categories: e.g. "architecture", "ethnic heritage", "community planning & development", etc.)

1. Other 3. _____ 5. _____
 2. Transportation 4. _____ 6. _____

DOCUMENTATION

Accessible Documentation Not Filed with the Site File - including field notes, analysis notes, photos, plans and other important documents

- 1) Document type All materials at one location Maintaining organization Archaeological Consultants Inc
 Document description _____ File or accession #'s P9026Q
- 2) Document type _____ Maintaining organization _____
 Document description _____ File or accession #'s _____

RECORDER INFORMATION

Recorder Name Christopher Berger Affiliation Archaeological Consultants Inc

Recorder Contact Information 8110 Blaikie Court, Suite A, Sarasota, FL 34240/941-379-6206/ACIFlorida@comcast.net
 (address / phone / fax / e-mail)

Required Attachments

- ① USGS 7.5' MAP WITH STRUCTURE LOCATION PINPOINTED IN RED
- ② LARGE SCALE STREET, PLAT OR PARCEL MAP (available from most property appraiser web sites)
- ③ PHOTO OF MAIN FACADE, ARCHIVAL B&W PRINT OR DIGITAL IMAGE FILE

If submitting an image file, it must be included on disk or CD AND in hard copy format (plain paper is acceptable).
 Digital image must be at least 1600 x 1200 pixels, 24-bit color, jpeg or tiff.

CONTINUATION SHEET**Narrative Description:**

NLAX 4005 is the only boxcar within the NASA Kennedy Space Center Railroad System (KSC-TO 2011). It is 55'-5" long, 10' wide, and weighs 70 tons. NLAX 4005 rests on four axles, rises 15'-1" off the ground, and has a capacity of 4,510 cubic feet. The double sliding door on the side of the car is 16' wide.

The car was built in 1970 by the American Car and Foundry Company and had the numbers RI 534005. NASA purchased it on March 6, 1985, from the Chicago Pacific Corp., formerly the Rock Island Railroad (KSC-TO 1987). A second boxcar in that order was to be used for a storage shed, but the status of that car is unknown (KSC-TO, Folder No. NLAX 4005). NLAX 4005 was used both to transport random materials and as a storage facility for large projects, such as locomotive engine rebuilds (Stephens 2012).

Bibliographic References:

NASA KSC, Transportation Office (KSC-TO)

1987 NASA Railroad Equipment Listing. August 10.

2011 NASA Railroad Equipment Listing. July 21.

Var. Folder No. NLAX 4005 Boxcar

Stephens, Mike (KSC Railroad technician)

2012 Email interview by Christopher Berger, March 7. Notes on file at Archaeological Consultants Inc.



PHOTOGRAPHS



NLAX 4005, 70-Ton, Boxcar

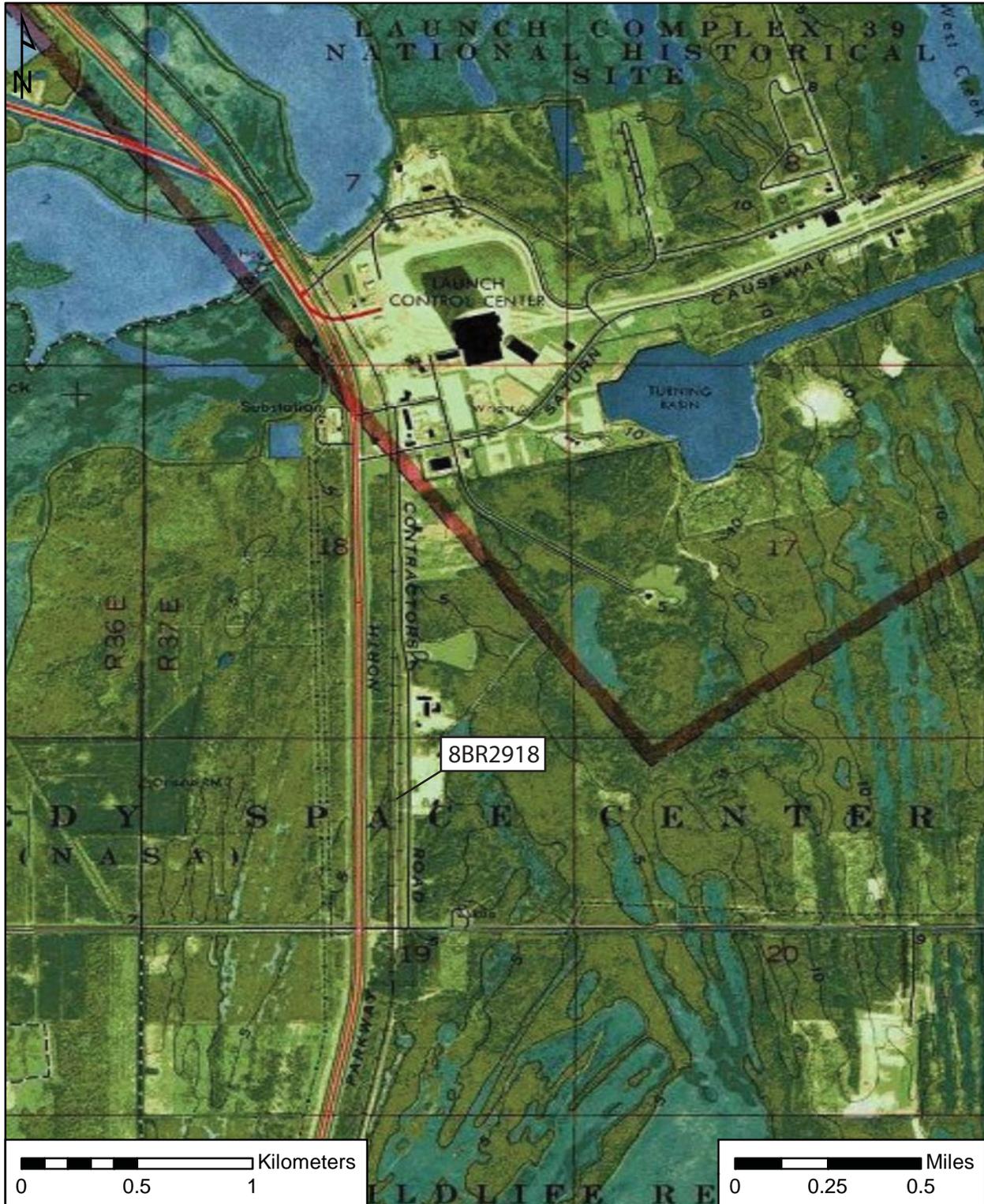


USGS

Orsino

Township 22 South, Range 37 East, Section 19

National Geographic Society (2011) USA Topo Maps.



Original
 Update



HISTORICAL STRUCTURE FORM

FLORIDA MASTER SITE FILE

Version 4.0 1/07

Site #8 **BR02919**
Field Date 1-24-2012
Form Date 2-2-2012
Recorder # 13

Shaded Fields represent the minimum acceptable level of documentation.
Consult the *Guide to Historical Structure Forms* for detailed instructions.

Site Name(s) (address if none) NASA KSC Railroad Helium Cars (13) Multiple Listing (DHR only) _____
Survey Project Name Historic Evaluation and Survey of Jay Jay Bridge Survey # (DHR only) _____
National Register Category (please check one) building structure district site object
Ownership: private-profit private-nonprofit private-individual private-nonspecific city county state federal Native American foreign unknown

LOCATION & MAPPING

Address: Contractor Street Number _____ Direction _____ Street Name _____ Street Type _____ Suffix Direction _____
Cross Streets (nearest / between) Schwartz Road and Saturn Causeway
USGS 7.5 Map Name ORSINO USGS Date 1976 Plat or Other Map _____
City / Town (within 3 miles) Titusville In City Limits? yes no unknown County Brevard
Township 22S Range 37E Section 19 1/4 section: NW SW SE NE Irregular-name: _____
Tax Parcel # Not applicable Landgrant _____
Subdivision Name _____ Block _____ Lot _____
UTM Coordinates: Zone 16 17 Easting 533794 Northing 3160101
Other Coordinates: X: _____ Y: _____ Coordinate System & Datum _____
Name of Public Tract (e.g., park) _____

HISTORY

Construction Year: 1961 approximately year listed or earlier year listed or later
Original Use Other From (year): 1961 To (year): curr
Current Use Other From (year): _____ To (year): _____
Other Use Railcar From (year): _____ To (year): _____
Moves: yes no unknown Date: _____ Original address _____
Alterations: yes no unknown Date: _____ Nature Attachment
Additions: yes no unknown Date: _____ Nature _____
Architect (last name first): _____ Builder (last name first): _____
Ownership History (especially original owner, dates, profession, etc.) U.S. Bureau of Land Management, 1961-1998; NASA, 1998-present

Is the Resource Affected by a Local Preservation Ordinance? yes no unknown Describe _____

DESCRIPTION

Style Not applicable Exterior Plan Not applicable Number of Stories NA
Exterior Fabric(s) 1. Steel 2. _____ 3. _____
Roof Type(s) 1. Not applicable 2. _____ 3. _____
Roof Material(s) 1. _____ 2. _____ 3. _____
Roof secondary strucs. (dormers etc.) 1. Not applicable 2. _____
Windows (types, materials, etc.) Not applicable

Distinguishing Architectural Features (exterior or interior ornaments) _____

Ancillary Features / Outbuildings (record outbuildings, major landscape features; use continuation sheet if needed.) _____

DHR USE ONLY		OFFICIAL EVALUATION		DHR USE ONLY	
NR List Date _____	SHPO – Appears to meet criteria for NR listing: <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> insufficient info	Date _____	Init. _____		
<input type="checkbox"/> Owner Objection	KEEPER – Determined eligible: <input type="checkbox"/> yes <input type="checkbox"/> no	Date _____			
	NR Criteria for Evaluation: <input type="checkbox"/> a <input type="checkbox"/> b <input type="checkbox"/> c <input type="checkbox"/> d (see <i>National Register Bulletin 15</i> , p. 2)				

DESCRIPTION (continued)

Chimney: No. ____ Chimney Material(s): 1. _____ 2. _____
 Structural System(s): 1. _____ 2. _____ 3. _____
 Foundation Type(s): 1. _____ 2. _____
 Foundation Material(s): 1. _____ 2. _____
 Main Entrance (stylistic details) _____

Porch Descriptions (types, locations, roof types, etc.) _____

Condition (overall resource condition): excellent good fair deteriorated ruinous

Narrative Description of Resource See continuation sheet

Archaeological Remains _____ Check if Archaeological Form Completed

RESEARCH METHODS (check all that apply)

FMSF record search (sites/surveys) library research building permits Sanborn maps
 FL State Archives/photo collection city directory occupant/owner interview plat maps
 property appraiser / tax records newspaper files neighbor interview Public Lands Survey (DEP)
 cultural resource survey (CRAS) historic photos interior inspection HABS/HAER record search
 other methods (describe) _____

Bibliographic References (give FMSF manuscript # if relevant, use continuation sheet if needed) See continuation sheet

OPINION OF RESOURCE SIGNIFICANCE

Appears to meet the criteria for National Register listing individually? yes no insufficient information

Appears to meet the criteria for National Register listing as part of a district? yes no insufficient information

Explanation of Evaluation (required, whether significant or not; use separate sheet if needed) Although NASA owns these railcars, they were not a significant contributor to any U.S. manned space program; therefore, they are not considered individually eligible for the NRHP, nor are they considered contributing to the NASA KSC Railroad HD.

Area(s) of Historical Significance (see *National Register Bulletin 15*, p. 8 for categories: e.g. "architecture", "ethnic heritage", "community planning & development", etc.)

1. Other 3. _____ 5. _____
 2. Transportation 4. _____ 6. _____

DOCUMENTATION

Accessible Documentation Not Filed with the Site File - including field notes, analysis notes, photos, plans and other important documents

1) Document type All materials at one location Maintaining organization Archaeological Consultants Inc
 Document description _____ File or accession #'s P9026Q

2) Document type _____ Maintaining organization _____
 Document description _____ File or accession #'s _____

RECORDER INFORMATION

Recorder Name Christopher Berger Affiliation Archaeological Consultants Inc

Recorder Contact Information 8110 Blaikie Court, Suite A, Sarasota, FL 34240/941-379-6206/ACIFlorida@comcast.net
 (address / phone / fax / e-mail)

Required Attachments

- ① USGS 7.5' MAP WITH STRUCTURE LOCATION PINPOINTED IN RED
- ② LARGE SCALE STREET, PLAT OR PARCEL MAP (available from most property appraiser web sites)
- ③ PHOTO OF MAIN FACADE, ARCHIVAL B&W PRINT OR DIGITAL IMAGE FILE

If submitting an image file, it must be included on disk or CD AND in hard copy format (plain paper is acceptable).
 Digital image must be at least 1600 x 1200 pixels, 24-bit color, jpeg or tiff.

CONTINUATION SHEET

Narrative Description:

There are 13 helium railroad cars within the NASA Kennedy Space Center Railroad System: MHAX1171 (AF 20), MHAX 1211B (AF 16), MHAX 1166 (AF 4), MHAX 1178B (AF 17), MHAX 1177 (AF 12), MHAX 1179 (AF 14), MHAX 1165B (AF 1), MHAX 1174 (AF 3), MHAX 1212B (AF 8), MHAX 1215A, MHAX 1192, MHAX 1213B, and MHAX 1204 (KSC-TO 2011).

The steel railcars are identical: 46'-1" -long, 10'-4" wide, and 12'-7" -tall. They weigh 235,000 pounds, which places them among the heaviest freight cars ever built, and have a load limit of 28,000 pounds (Houston Railroad Museum Equipment Roster n.d.). Each car has four axles and two separate braking systems, one for each truck. Long bottle tanks with ¾" nominal walls are held by pressurized banks within the cars, and each car can hold six rows of tanks stacked five high for a total of 30 tanks per car. Pentagon-shaped steel caps are located at the end of each helium car, and one of the ends has double steel doors that houses the mechanical equipment used to regulate the tanks' pressure. Each helium car has a steel frame divided into three bays and is enclosed on top by steel straps.

The 13 cars were all built in approximately 1961 for the U.S. Bureau of Land Management and cost from \$91,422.02 to \$105,825.81 each (KSC-TO, Folder No. MHAX Cars). They were used to transport helium from mines near Amarillo, Texas, to locations throughout the United States (Hoffman 2012). The United States Air Force used helium to purge Titan rocket lines, and the NASA Railroad helped move the helium railcars through KSC to the Cape Canaveral Air Force Station (Stephens 2012). The helium arrived in the cars as a liquid, and a plant at KSC converted it to a gas. The railcars were then hauled to the Air Force interchange (NASA 2007).

The government privatized the mining and transportation of helium in the 1980s, and some of its helium railcars were transferred to KSC for in-plant use; they were used to store helium up until the last shuttle launch in 2011 (Stephens 2012). The 13 cars that remain at KSC were among the 34 helium cars acquired by NASA in April 1998 (KSC-TO, Folder No. MHAX Cars). It is believed that 21 of the cars have been given to railroad museums or have been scrapped (Stephens 2012).

Bibliographic References:

Hoffman, Dave (retired NASA Railroad Manager)

2012 Interview by Christopher Berger and Patricia Slovinac, February 27. Notes on file at Archaeological Consultants Inc.

Houston Railroad Museum Equipment Roster.

n.d. U.S. Bureau of Land Management No. 1237. Accessed on February 2, 2012, at <http://kingswayrc.com/gcst/roster/1237.html>.

NASA KSC, Transportation Office (KSC-TO)

Var. Folder No. MHAX Cars.

2011 NASA Railroad Equipment Listing. July 21.

National Aeronautics and Space Administration.

2007 *Facts: The NASA Railroad.*

Stephens, Mike (KSC Railroad technician)

2012 Email interview by Christopher Berger, March 7. Notes on file at Archaeological Consultants Inc.



PHOTOGRAPHS



MHAX 1174, Helium Car

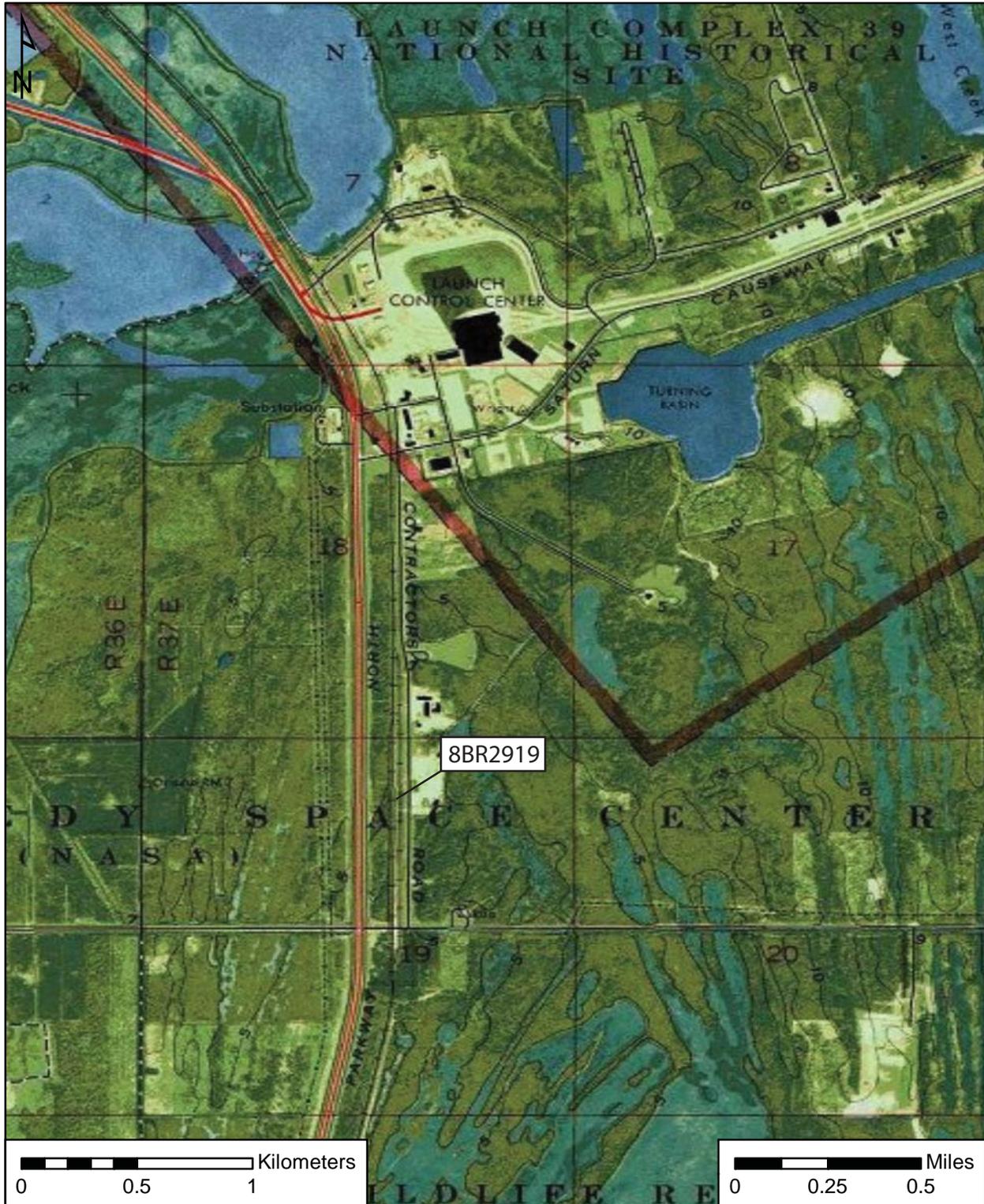


USGS

Orsino

Township 22 South, Range 37 East, Section 19

National Geographic Society (2011) USA Topo Maps.



Original
 Update



HISTORICAL STRUCTURE FORM

FLORIDA MASTER SITE FILE

Version 4.0 1/07

Site #8 **BR02920**
Field Date 1-24-2012
Form Date 2-7-2012
Recorder # 15

Shaded Fields represent the minimum acceptable level of documentation.
Consult the *Guide to Historical Structure Forms* for detailed instructions.

Site Name(s) (address if none) NLAX 201; NLAX 202 Multiple Listing (DHR only) _____
Survey Project Name Historic Survey of NASA Railroad System Survey # (DHR only) _____
National Register Category (please check one) building structure district site object
Ownership: private-profit private-nonprofit private-individual private-nonspecific city county state federal Native American foreign unknown

LOCATION & MAPPING

Address: Contractor Street Number _____ Direction _____ Street Name _____ Street Type Road Suffix Direction _____
Cross Streets (nearest / between) Schwartz Road and Saturn Causeway
USGS 7.5 Map Name ORSINO USGS Date 1976 Plat or Other Map _____
City / Town (within 3 miles) Titusville In City Limits? yes no unknown County Brevard
Township 22S Range 37E Section 19 1/4 section: NW SW SE NE Irregular-name: _____
Tax Parcel # Not applicable Landgrant _____
Subdivision Name _____ Block _____ Lot _____
UTM Coordinates: Zone 16 17 Easting 533794 Northing 3160101
Other Coordinates: X: _____ Y: _____ Coordinate System & Datum _____
Name of Public Tract (e.g., park) _____

HISTORY

Construction Year: 1965 approximately year listed or earlier year listed or later
Original Use Other From (year): 1965 To (year): cur
Current Use Other From (year): _____ To (year): _____
Other Use Railcar From (year): _____ To (year): _____
Moves: yes no unknown Date: _____ Original address _____
Alterations: yes no unknown Date: _____ Nature See continuation sheet
Additions: yes no unknown Date: _____ Nature _____
Architect (last name first): _____ Builder (last name first): Linde
Ownership History (especially original owner, dates, profession, etc.) NASA, 1965-present

Is the Resource Affected by a Local Preservation Ordinance? yes no unknown Describe _____

DESCRIPTION

Style Not applicable Exterior Plan Not applicable Number of Stories NA
Exterior Fabric(s) 1. Steel 2. _____ 3. _____
Roof Type(s) 1. _____ 2. _____ 3. _____
Roof Material(s) 1. _____ 2. _____ 3. _____
Roof secondary strucs. (dormers etc.) 1. _____ 2. _____
Windows (types, materials, etc.) _____

Distinguishing Architectural Features (exterior or interior ornaments) _____

Ancillary Features / Outbuildings (record outbuildings, major landscape features; use continuation sheet if needed.) _____

DHR USE ONLY		OFFICIAL EVALUATION		DHR USE ONLY	
NR List Date _____	SHPO – Appears to meet criteria for NR listing: <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> insufficient info	Date _____	Init. _____		
<input type="checkbox"/> Owner Objection	KEEPER – Determined eligible: <input type="checkbox"/> yes <input type="checkbox"/> no	Date _____			
	NR Criteria for Evaluation: <input type="checkbox"/> a <input type="checkbox"/> b <input type="checkbox"/> c <input type="checkbox"/> d (see <i>National Register Bulletin 15</i> , p. 2)				

DESCRIPTION (continued)

Chimney: No. ____ Chimney Material(s): 1. _____ 2. _____
 Structural System(s): 1. _____ 2. _____ 3. _____
 Foundation Type(s): 1. _____ 2. _____
 Foundation Material(s): 1. _____ 2. _____
 Main Entrance (stylistic details) _____

Porch Descriptions (types, locations, roof types, etc.) _____

Condition (overall resource condition): excellent good fair deteriorated ruinous

Narrative Description of Resource See continuation sheet

Archaeological Remains _____ Check if Archaeological Form Completed

RESEARCH METHODS (check all that apply)

FMSF record search (sites/surveys) library research building permits Sanborn maps
 FL State Archives/photo collection city directory occupant/owner interview plat maps
 property appraiser / tax records newspaper files neighbor interview Public Lands Survey (DEP)
 cultural resource survey (CRAS) historic photos interior inspection HABS/HAER record search
 other methods (describe) _____

Bibliographic References (give FMSF manuscript # if relevant, use continuation sheet if needed) See continuation sheet

OPINION OF RESOURCE SIGNIFICANCE

Appears to meet the criteria for National Register listing individually? yes no insufficient information

Appears to meet the criteria for National Register listing as part of a district? yes no insufficient information

Explanation of Evaluation (required, whether significant or not; use separate sheet if needed) Although NASA owns these railcars, they were not a significant contributor to any U.S. manned space program; therefore, they are not considered individually eligible for the NRHP, nor are they considered contributing to the NASA KSC Railroad HD.

Area(s) of Historical Significance (see *National Register Bulletin 15*, p. 8 for categories: e.g. "architecture", "ethnic heritage", "community planning & development", etc.)

1. Other 3. _____ 5. _____
 2. Transportation 4. _____ 6. _____

DOCUMENTATION

Accessible Documentation Not Filed with the Site File - including field notes, analysis notes, photos, plans and other important documents

1) Document type All materials at one location Maintaining organization Archaeological Consultants Inc
 Document description _____ File or accession #'s P9026Q

2) Document type _____ Maintaining organization _____
 Document description _____ File or accession #'s _____

RECORDER INFORMATION

Recorder Name Christopher Berger Affiliation Archaeological Consultants Inc

Recorder Contact Information 8110 Blaikie Court, Suite A, Sarasota, FL 34240/941-379-6206/ACIFlorida@comcast.net
 (address / phone / fax / e-mail)

Required Attachments

- ① USGS 7.5' MAP WITH STRUCTURE LOCATION PINPOINTED IN RED
- ② LARGE SCALE STREET, PLAT OR PARCEL MAP (available from most property appraiser web sites)
- ③ PHOTO OF MAIN FACADE, ARCHIVAL B&W PRINT OR DIGITAL IMAGE FILE

If submitting an image file, it must be included on disk or CD AND in hard copy format (plain paper is acceptable).
 Digital image must be at least 1600 x 1200 pixels, 24-bit color, jpeg or tiff.

CONTINUATION SHEET**Narrative Description:**

NLAX 201 and NLAX 202 are 70-ton hydrogen tank railroad cars within the NASA Kennedy Space Center Railroad System. The steel railcars are 83' long, and their tanks hold approximately 34,400 gallons (KSC-TO, Folder No. 6670-5-202). Each of the railcars has four axles and two trucks with a cushioned underframe. The refrigeration equipment is housed within a square compartment at one end of each car's tank, and a manway near the compartment provides access to the tank's interior. The bottom third of the cars are painted yellow, and the remainder is white.

NASA purchased NLAX 201 and NLAX 202 new from Linde circa 1965, according to an August 10, 1987, NASA Railroad inventory (KSC-TO 1987). From 1965 to 1981, the railcars were used at what is now known as the Glenn Research Center (Hoffman 2012). NLAX 202 was reconditioned and painted by Western Sales and Testing Inc. in Amarillo, Texas, for approximately \$221,000, according to a March 19, 1982, document (KSC-TO, Folder No. 6670-5-202). NLAX 201 probably received similar work at the same time. The cars were used to transport refrigerated, liquefied hydrogen from New Orleans to the Kennedy Space Center. The railcars were parked on the tracks near the launch pads, and the hydrogen was used in support of the Space Shuttle Program (Hoffman 2012). NLAX 201 and NLAX 202 were only used on a few occasions, and maintenance of Folder No. NLAX 201 and 202 ceased on July 5, 1994 (KSC-TO, Folder No. LH2 Railcar Maintenance and Storage).

Both NLAX 201 and NLAX 202 reportedly have been sold (Stephens 2012).

Bibliographic References:

Hoffman, Dave (retired NASA Railroad Manager)

2012 Interview by Christopher Berger and Patricia Slovinac, February 27. Notes on file at Archaeological Consultants, Inc.

NASA KSC, Transportation Office (KSC-TO)

1987 NASA Railroad Equipment Listing. August 10.

Var. Folder No. LH2 Railcar Maintenance and Storage

Var. Folder No. 6670-5-202 NLAX 202

Stephens, Mike (KSC Railroad technician).

2012 Interview by Christopher Berger, January 26. Notes on file at Archaeological Consultants, Inc.



PHOTOGRAPHS



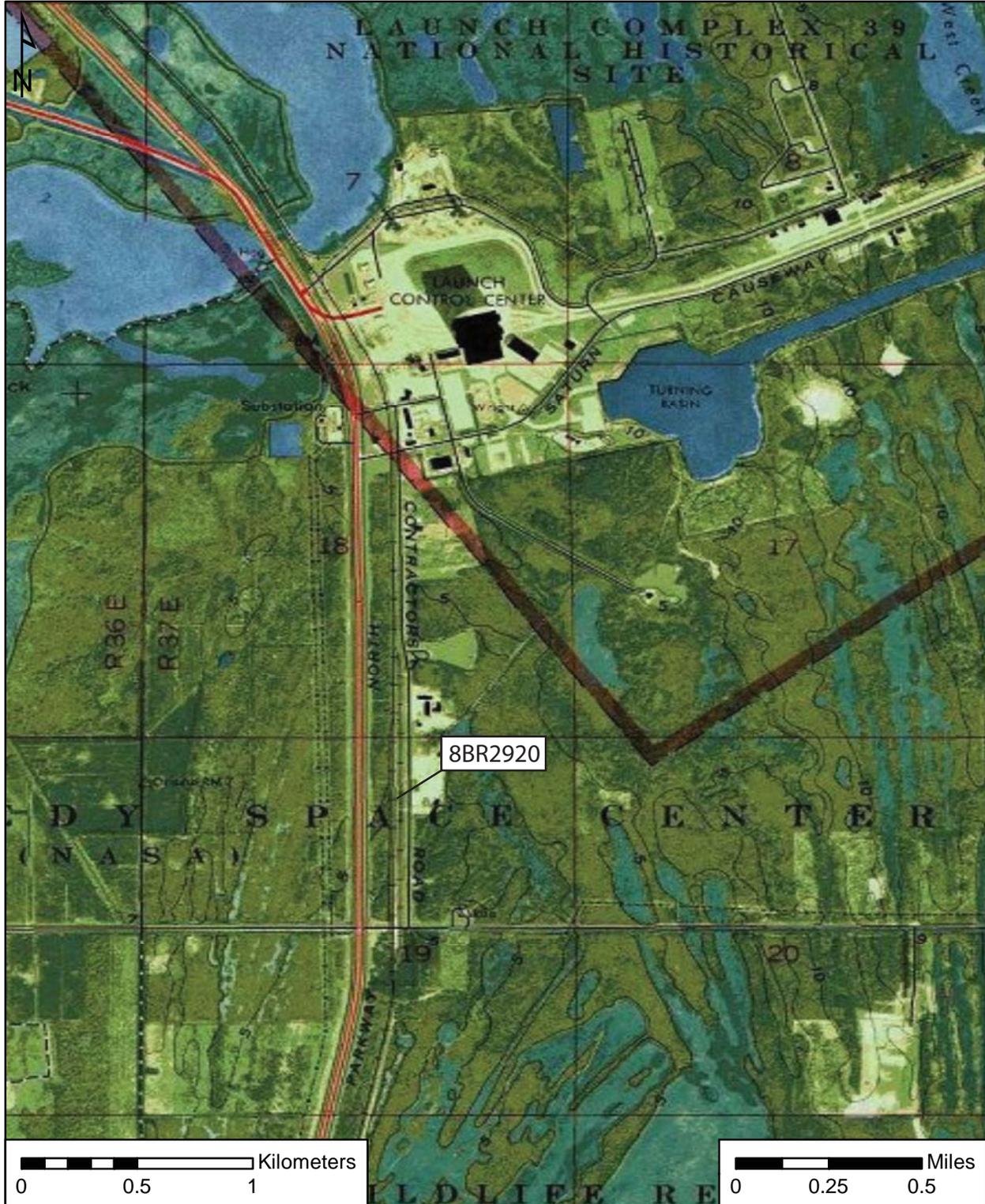
NLAX 201, 70-Ton Hydrogen Tank



USGS

Orsino

Township 22 South, Range 37 East, Section 19
National Geographic Society (2011) USA Topo Maps.



Original
 Update



HISTORICAL STRUCTURE FORM

FLORIDA MASTER SITE FILE

Version 4.0 1/07

Site #8 **BR02921**
Field Date 1-24-2012
Form Date 2-9-2012
Recorder # 16

Shaded Fields represent the minimum acceptable level of documentation.
Consult the *Guide to Historical Structure Forms* for detailed instructions.

Site Name(s) (address if none) NLAX 130; NLAX 131 Multiple Listing (DHR only) _____
Survey Project Name Historic Survey of NASA Railroad System Survey # (DHR only) _____
National Register Category (please check one) building structure district site object
Ownership: private-profit private-nonprofit private-individual private-nonspecific city county state federal Native American foreign unknown

LOCATION & MAPPING

Address: Contractor Street Number _____ Direction _____ Street Name _____ Street Type _____ Suffix Direction _____
Cross Streets (nearest / between) Schwartz Road and Saturn Causeway
USGS 7.5 Map Name ORSINO USGS Date 1976 Plat or Other Map _____
City / Town (within 3 miles) Titusville In City Limits? yes no unknown County Brevard
Township 22S Range 37E Section 19 1/4 section: NW SW SE NE Irregular-name: _____
Tax Parcel # Not applicable Landgrant _____
Subdivision Name _____ Block _____ Lot _____
UTM Coordinates: Zone 16 17 Easting 533794 Northing 3160101
Other Coordinates: X: _____ Y: _____ Coordinate System & Datum _____
Name of Public Tract (e.g., park) _____

HISTORY

Construction Year: 1965 approximately year listed or earlier year listed or later
Original Use Other From (year): 1965 To (year): cur
Current Use Other From (year): _____ To (year): _____
Other Use Railcar From (year): _____ To (year): _____
Moves: yes no unknown Date: _____ Original address _____
Alterations: yes no unknown Date: 1-1-1993 Nature Reconditioned
Additions: yes no unknown Date: _____ Nature _____
Architect (last name first): _____ Builder (last name first): GATX
Ownership History (especially original owner, dates, profession, etc.) Oil-Dri Corporation, dates unknown; NASA, unknown-present

Is the Resource Affected by a Local Preservation Ordinance? yes no unknown Describe _____

DESCRIPTION

Style Not applicable Exterior Plan Not applicable Number of Stories NA
Exterior Fabric(s) 1. Steel 2. _____ 3. _____
Roof Type(s) 1. _____ 2. _____ 3. _____
Roof Material(s) 1. _____ 2. _____ 3. _____
Roof secondary strucs. (dormers etc.) 1. _____ 2. _____
Windows (types, materials, etc.) _____

Distinguishing Architectural Features (exterior or interior ornaments) _____

Ancillary Features / Outbuildings (record outbuildings, major landscape features; use continuation sheet if needed.) _____

DHR USE ONLY		OFFICIAL EVALUATION		DHR USE ONLY	
NR List Date _____	SHPO – Appears to meet criteria for NR listing: <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> insufficient info	Date _____	Init. _____		
<input type="checkbox"/> Owner Objection	KEEPER – Determined eligible: <input type="checkbox"/> yes <input type="checkbox"/> no	Date _____			
	NR Criteria for Evaluation: <input type="checkbox"/> a <input type="checkbox"/> b <input type="checkbox"/> c <input type="checkbox"/> d (see <i>National Register Bulletin 15</i> , p. 2)				

DESCRIPTION (continued)

Chimney: No. ____ Chimney Material(s): 1. _____ 2. _____
 Structural System(s): 1. _____ 2. _____ 3. _____
 Foundation Type(s): 1. _____ 2. _____
 Foundation Material(s): 1. _____ 2. _____
 Main Entrance (stylistic details) _____

Porch Descriptions (types, locations, roof types, etc.) _____

Condition (overall resource condition): excellent good fair deteriorated ruinous

Narrative Description of Resource See continuation sheet

Archaeological Remains _____ Check if Archaeological Form Completed

RESEARCH METHODS (check all that apply)

FMSF record search (sites/surveys) library research building permits Sanborn maps
 FL State Archives/photo collection city directory occupant/owner interview plat maps
 property appraiser / tax records newspaper files neighbor interview Public Lands Survey (DEP)
 cultural resource survey (CRAS) historic photos interior inspection HABS/HAER record search
 other methods (describe) _____

Bibliographic References (give FMSF manuscript # if relevant, use continuation sheet if needed) See continuation sheet

OPINION OF RESOURCE SIGNIFICANCE

Appears to meet the criteria for National Register listing individually? yes no insufficient information

Appears to meet the criteria for National Register listing as part of a district? yes no insufficient information

Explanation of Evaluation (required, whether significant or not; use separate sheet if needed) Although NASA owns these railcars, they were not a significant contributor to any U.S. manned space program; therefore, they are not considered individually eligible for the NR, nor are they considered contributing to the NASA KSC Railroad HD.

Area(s) of Historical Significance (see *National Register Bulletin 15*, p. 8 for categories: e.g. "architecture", "ethnic heritage", "community planning & development", etc.)

1. Transportation 3. Other 5. _____
 2. Industry 4. _____ 6. _____

DOCUMENTATION

Accessible Documentation Not Filed with the Site File - including field notes, analysis notes, photos, plans and other important documents

1) Document type All materials at one location Maintaining organization Archaeological Consultants Inc
 Document description _____ File or accession #'s P9026Q
 2) Document type _____ Maintaining organization _____
 Document description _____ File or accession #'s _____

RECORDER INFORMATION

Recorder Name Christopher Berger Affiliation Archaeological Consultants Inc

Recorder Contact Information 8110 Blaikie Court, Suite A, Sarasota, FL 34240/941-379-6206/ACIFlorida@comcast.net
 (address / phone / fax / e-mail)

Required Attachments

- ① USGS 7.5' MAP WITH STRUCTURE LOCATION PINPOINTED IN RED
- ② LARGE SCALE STREET, PLAT OR PARCEL MAP (available from most property appraiser web sites)
- ③ PHOTO OF MAIN FACADE, ARCHIVAL B&W PRINT OR DIGITAL IMAGE FILE

If submitting an image file, it must be included on disk or CD AND in hard copy format (plain paper is acceptable).
 Digital image must be at least 1600 x 1200 pixels, 24-bit color, jpeg or tiff.

CONTINUATION SHEET**Narrative Description:**

NLAX 130 and NLAX 131 are 70-ton, 90'-flat spacer railroad cars within NASA Kennedy Space Center Railroad System. They rest on two trucks and have a cushioned underframe with small tanks underneath. They lack decks, and instead platforms are found at either end of the car surrounded by handrails and accessible by a short ladder.

The cars were built by General American Transportation Corporation in 1965 and owned by the Oil-Dri Corporation with the numbers OTDX 2010 and OTDX 2013. It is unknown when NLAX 130 and NLAX 131 first arrived at the Kennedy Space Center, and their earliest reference is an August 10, 1987, inventory, which indicates they were skeleton cars used to hold 20' and 40' intermodal containers (KSC-TO 1987). They were reconditioned in 1993 and designated as spacer cars (KSC-TO 1993).

Bibliographic References:

NASA KSC, Transportation Office (KSC-TO)
1993 Support Request 130-131, no folder
1987 NASA Railroad Equipment Listing. August 10.



PHOTOGRAPHS



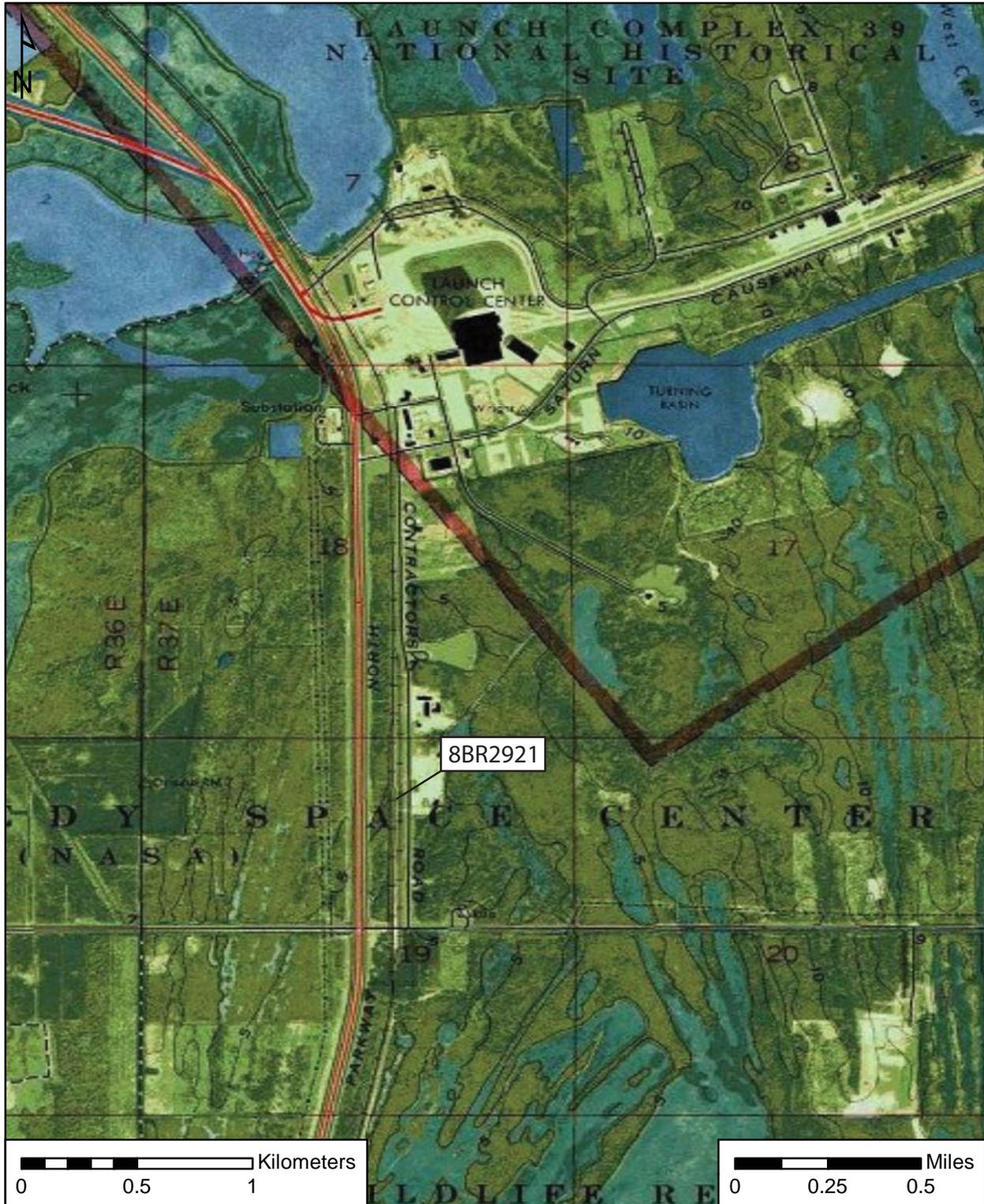
NLAX 131, 70-Ton, 90-Foot Flat Spacer



USGS

Orsino

Township 22 South, Range 37 East, Section 19
National Geographic Society (2011) USA Topo Maps.



Original
 Update



HISTORICAL STRUCTURE FORM

FLORIDA MASTER SITE FILE

Version 4.0 1/07

Site #8 **BR02922**
Field Date 1-24-2012
Form Date 1-25-2012
Recorder # 17

Shaded Fields represent the minimum acceptable level of documentation.
Consult the *Guide to Historical Structure Forms* for detailed instructions.

Site Name(s) (address if none) NLAX 100, "Blue Ox" Multiple Listing (DHR only) _____
Survey Project Name Historic Survey of NASA Railroad System Survey # (DHR only) _____
National Register Category (please check one) building structure district site object
Ownership: private-profit private-nonprofit private-individual private-nonspecific city county state federal Native American foreign unknown

LOCATION & MAPPING

Address: Contractor Street Number _____ Direction _____ Street Name _____ Street Type Road Suffix Direction _____
Cross Streets (nearest / between) Schwartz Road and Saturn Causeway
USGS 7.5 Map Name ORSINO USGS Date 1976 Plat or Other Map _____
City / Town (within 3 miles) Titusville In City Limits? yes no unknown County Brevard
Township 22S Range 37E Section 19 ¼ section: NW SW SE NE Irregular-name: _____
Tax Parcel # Not applicable Landgrant _____
Subdivision Name _____ Block _____ Lot _____
UTM Coordinates: Zone 16 17 Easting 533794 Northing 3160101
Other Coordinates: X: _____ Y: _____ Coordinate System & Datum _____
Name of Public Tract (e.g., park) _____

HISTORY

Construction Year: 1976 approximately year listed or earlier year listed or later
Original Use Other From (year): 1976 To (year): cur
Current Use Other From (year): _____ To (year): _____
Other Use Railcar From (year): _____ To (year): _____
Moves: yes no unknown Date: _____ Original address _____
Alterations: yes no unknown Date: _____ Nature See continuation sheet
Additions: yes no unknown Date: _____ Nature _____
Architect (last name first): _____ Builder (last name first): Pullman
Ownership History (especially original owner, dates, profession, etc.) Pullman, 1976-unknown; Star Railroad Equipment, unknown-1987; NASA, 1987-present
Is the Resource Affected by a Local Preservation Ordinance? yes no unknown Describe _____

DESCRIPTION

Style Not applicable Exterior Plan Not applicable Number of Stories NA
Exterior Fabric(s) 1. Steel 2. _____ 3. _____
Roof Type(s) 1. _____ 2. _____ 3. _____
Roof Material(s) 1. _____ 2. _____ 3. _____
Roof secondary strucs. (dormers etc.) 1. _____ 2. _____
Windows (types, materials, etc.) _____
Distinguishing Architectural Features (exterior or interior ornaments) _____
Ancillary Features / Outbuildings (record outbuildings, major landscape features; use continuation sheet if needed.) _____

DHR USE ONLY		OFFICIAL EVALUATION		DHR USE ONLY	
NR List Date _____	SHPO – Appears to meet criteria for NR listing: <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> insufficient info	Date _____	Init. _____		
<input type="checkbox"/> Owner Objection	KEEPER – Determined eligible: <input type="checkbox"/> yes <input type="checkbox"/> no	Date _____			
	NR Criteria for Evaluation: <input type="checkbox"/> a <input type="checkbox"/> b <input type="checkbox"/> c <input type="checkbox"/> d (see <i>National Register Bulletin 15</i> , p. 2)				

DESCRIPTION (continued)

Chimney: No. ____ Chimney Material(s): 1. _____ 2. _____
 Structural System(s): 1. _____ 2. _____ 3. _____
 Foundation Type(s): 1. _____ 2. _____
 Foundation Material(s): 1. _____ 2. _____
 Main Entrance (stylistic details) _____

Porch Descriptions (types, locations, roof types, etc.) _____

Condition (overall resource condition): excellent good fair deteriorated ruinous

Narrative Description of Resource See continuation sheet

Archaeological Remains _____ Check if Archaeological Form Completed

RESEARCH METHODS (check all that apply)

FMSF record search (sites/surveys) library research building permits Sanborn maps
 FL State Archives/photo collection city directory occupant/owner interview plat maps
 property appraiser / tax records newspaper files neighbor interview Public Lands Survey (DEP)
 cultural resource survey (CRAS) historic photos interior inspection HABS/HAER record search
 other methods (describe) _____

Bibliographic References (give FMSF manuscript # if relevant, use continuation sheet if needed) See continuation sheet

OPINION OF RESOURCE SIGNIFICANCE

Appears to meet the criteria for National Register listing individually? yes no insufficient information

Appears to meet the criteria for National Register listing as part of a district? yes no insufficient information

Explanation of Evaluation (required, whether significant or not; use separate sheet if needed) See continuation sheet

Area(s) of Historical Significance (see *National Register Bulletin 15*, p. 8 for categories: e.g. "architecture", "ethnic heritage", "community planning & development", etc.)

1. Other 3. _____ 5. _____
 2. Transportation 4. _____ 6. _____

DOCUMENTATION

Accessible Documentation Not Filed with the Site File - including field notes, analysis notes, photos, plans and other important documents

1) Document type All materials at one location Maintaining organization Archaeological Consultants Inc
 Document description _____ File or accession #'s P9026Q
 2) Document type _____ Maintaining organization _____
 Document description _____ File or accession #'s _____

RECORDER INFORMATION

Recorder Name Christopher Berger Affiliation Archaeological Consultants Inc

Recorder Contact Information 8110 Blaikie Court, Suite A, Sarasota, FL 34240/941-379-6206/ACIFlorida@comcast.net
 (address / phone / fax / e-mail)

Required Attachments

- ① USGS 7.5' MAP WITH STRUCTURE LOCATION PINPOINTED IN RED
- ② LARGE SCALE STREET, PLAT OR PARCEL MAP (available from most property appraiser web sites)
- ③ PHOTO OF MAIN FACADE, ARCHIVAL B&W PRINT OR DIGITAL IMAGE FILE

If submitting an image file, it must be included on disk or CD AND in hard copy format (plain paper is acceptable).
 Digital image must be at least 1600 x 1200 pixels, 24-bit color, jpeg or tiff.

CONTINUATION SHEET

Narrative Description

NLAX 100 (8BR2922) is a gondola railroad car within the NASA Kennedy Space Center (KSC) Railroad System. Known as the “Blue Ox,” the steel car is approximately 74’ long, 9’-9” wide, and 15’ tall. It weighs 100 tons and sits on four axles. NLAX 100 has two discharge openings and six doors, which were attached to the side sill with 2” pins and reinforced with box beams. When the car was unloaded, an air-powered tripping device between the rails linked to an on-car control on the center sill to free the rotary latch locking device. The interior of the railcar has a partitioned 50’-8”-long load area with a capacity of 7,000 cubic feet. A 44’ wide platform rises a few feet above the top of the side sheets and is held by two tiedowns (KSC-TO, Folder No. 6670-5-100).

NLAX 100 was built as a prototype in June 1976 by Pullman at its Butler, Pennsylvania, plant after three years of research and development in collaboration with International Paper Company. The car, which had the numbers PLCX 81, was designed to carry long logs, pulp wood logs, and wood chips. NLAX 100 could discharge 79 tons of logs measuring up to 49’ in four seconds, and 83 tons of 7’ logs in 3.5 seconds. At the time, Pullman said the multipurpose car—featured in a cover story for the October 25, 1976, issue of *Railway Age* magazine—could save Southern pulpwood mills up to \$20 million a year and revolutionize the transportation of bulk commodities (Welty 1976).

In the mid-1980s, NASA sought to transport one of the two, 18’ x 45’ aft access platforms from Palmdale, California, where the orbiters were built, to KSC, where the orbiters were processed. It would have cost approximately \$500,000 to transport the platform aboard an Air Force C-5 airplane, so instead NASA bought the railcar, which was about to be scrapped, from Star Railroad Equipment of Lansing, Illinois, for \$15,000 in May 1987 (Hoffman 2012; KSC-TO, Folder No. 6670-5-094). At that time, the railcar was numbered NLAX 81 and the six doors at the base were welded shut. In 1990, the car was renumbered NLAX 100 and the air-powered door trip was disconnected; the side-discharge doors and slope sheets were replaced in late 1994 (KSC-TO, Folder No. 6670-5-100). The car has been used infrequently since it transported the aft access platforms (Hoffman 2012).

Explanation of Evaluation

Although NLAX 100’s one-of-a-kind design was ideally suited to transport the bulky aft access platform and saved NASA hundreds of thousands of dollars, it was only used to transport specific SSP equipment that one time. Therefore, it is not considered to be a significant contributor to the SSP or any other U.S. Manned Space Program. Thus, it is not considered eligible for the NRHP either individually or as a contributing resource to the NASA Railroad System Historic District.

Bibliographic References

Hoffman, Dave (retired NASA Railroad Manager)

2012 Interview by Christopher Berger and Patricia Slovinac, February 27. Notes on file at Archaeological Consultants, Inc.

NASA KSC, Transportation Office (KSC-TO)

Var. Folder No. 6670-5-100

Welty, Gus

1976 The Blue Ox: One Car for Three Jobs. Reprint of *Railway Age*, 25 October. On file, NASA Transportation Office, Folder No. Blue Ox Special Hopper Pullman Standard 1976; Formerly PLCX 81.



PHOTOGRAPHS



NLAX 100, 100-Ton, 74-Foot Gondola



NLAX 100, 100-Ton, 74-Foot Gondola (KSC, 387C-1959)

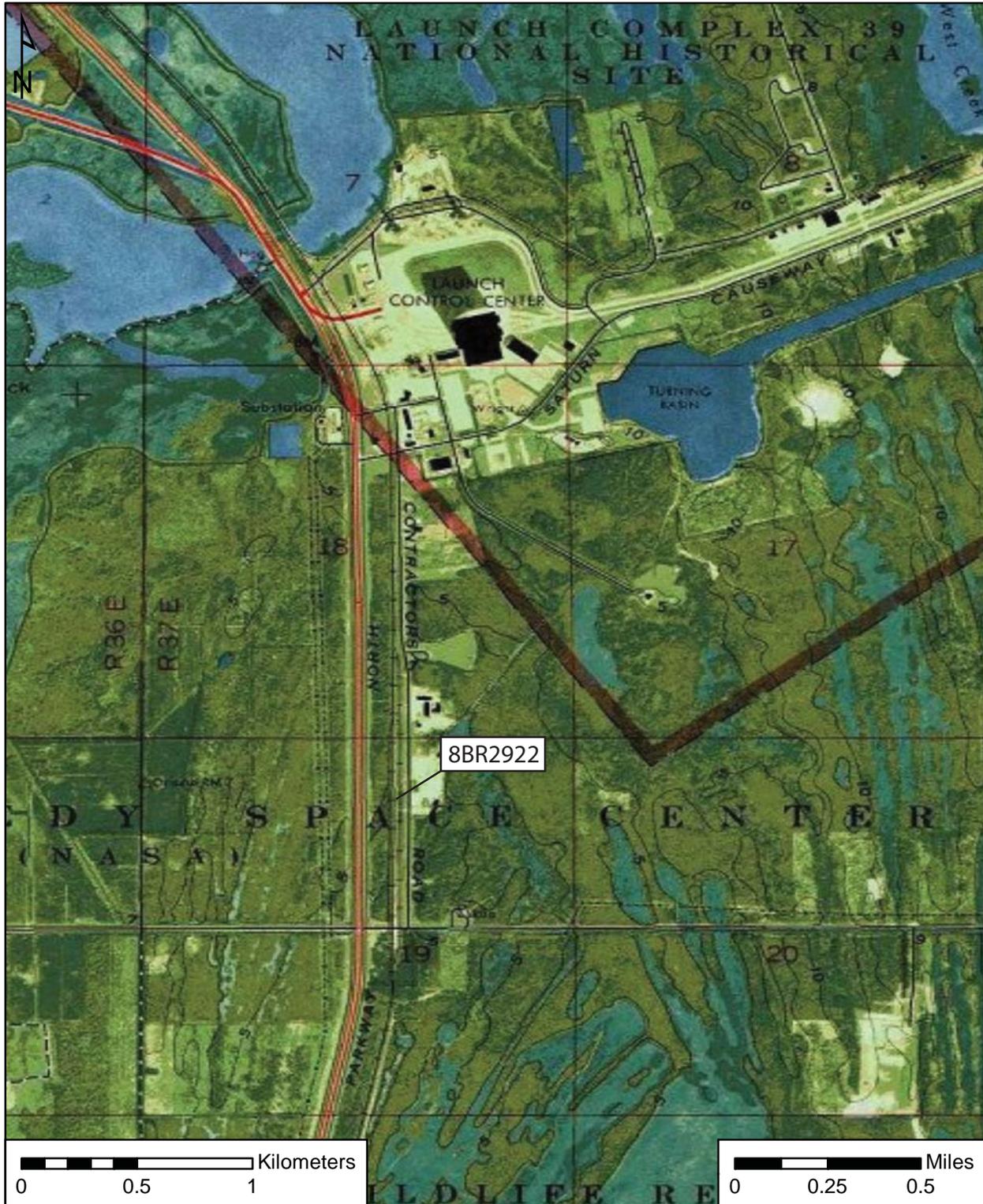


USGS

Orsino

Township 22 South, Range 37 East, Section 19

National Geographic Society (2011) USA Topo Maps.



Original
 Update



HISTORICAL STRUCTURE FORM

FLORIDA MASTER SITE FILE

Version 4.0 1/07

Site #8 **BR02924**
Field Date 1-24-2012
Form Date 2-9-2012
Recorder # 19

Shaded Fields represent the minimum acceptable level of documentation.
Consult the *Guide to Historical Structure Forms* for detailed instructions.

Site Name(s) (address if none) NLAX 122; NLAX 123 Multiple Listing (DHR only) _____
Survey Project Name Historic Survey of NASA Railroad System Survey # (DHR only) _____
National Register Category (please check one) building structure district site object
Ownership: private-profit private-nonprofit private-individual private-nonspecific city county state federal Native American foreign unknown

LOCATION & MAPPING

Address: Contractor Street Number _____ Direction _____ Street Name _____ Street Type Road Suffix Direction _____
Cross Streets (nearest / between) Schwartz Road and Saturn Causeway
USGS 7.5 Map Name ORSINO USGS Date 1976 Plat or Other Map _____
City / Town (within 3 miles) Titusville In City Limits? yes no unknown County Brevard
Township 22S Range 37E Section 19 1/4 section: NW SW SE NE Irregular-name: _____
Tax Parcel # Not applicable Landgrant _____
Subdivision Name _____ Block _____ Lot _____
UTM Coordinates: Zone 16 17 Easting 533794 Northing 3160101
Other Coordinates: X: _____ Y: _____ Coordinate System & Datum _____
Name of Public Tract (e.g., park) _____

HISTORY

Construction Year: 1961 approximately year listed or earlier year listed or later
Original Use Other From (year): 1961 To (year): cur
Current Use Other From (year): _____ To (year): _____
Other Use Railcar From (year): _____ To (year): _____
Moves: yes no unknown Date: _____ Original address _____
Alterations: yes no unknown Date: _____ Nature _____
Additions: yes no unknown Date: _____ Nature _____
Architect (last name first): _____ Builder (last name first): Pullman
Ownership History (especially original owner, dates, profession, etc.) Western Pacific, dates unknown; Ortner Freight Car Co., unknown-1982; NASA, 1982-present
Is the Resource Affected by a Local Preservation Ordinance? yes no unknown Describe _____

DESCRIPTION

Style Not applicable Exterior Plan Not applicable Number of Stories NA
Exterior Fabric(s) 1. Steel 2. _____ 3. _____
Roof Type(s) 1. _____ 2. _____ 3. _____
Roof Material(s) 1. _____ 2. _____ 3. _____
Roof secondary strucs. (dormers etc.) 1. _____ 2. _____
Windows (types, materials, etc.) _____
Distinguishing Architectural Features (exterior or interior ornaments) _____
Ancillary Features / Outbuildings (record outbuildings, major landscape features; use continuation sheet if needed.) _____

DHR USE ONLY		OFFICIAL EVALUATION		DHR USE ONLY	
NR List Date _____	SHPO – Appears to meet criteria for NR listing: <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> insufficient info	Date _____	Init. _____		
<input type="checkbox"/> Owner Objection	KEEPER – Determined eligible: <input type="checkbox"/> yes <input type="checkbox"/> no	Date _____			
	NR Criteria for Evaluation: <input type="checkbox"/> a <input type="checkbox"/> b <input type="checkbox"/> c <input type="checkbox"/> d (see <i>National Register Bulletin 15</i> , p. 2)				

DESCRIPTION (continued)

Chimney: No. _____ Chimney Material(s): 1. _____ 2. _____
 Structural System(s): 1. _____ 2. _____ 3. _____
 Foundation Type(s): 1. _____ 2. _____
 Foundation Material(s): 1. _____ 2. _____
 Main Entrance (stylistic details) _____

Porch Descriptions (types, locations, roof types, etc.) _____

Condition (overall resource condition): excellent good fair deteriorated ruinous

Narrative Description of Resource See continuation sheet

Archaeological Remains _____ Check if Archaeological Form Completed

RESEARCH METHODS (check all that apply)

FMSF record search (sites/surveys) library research building permits Sanborn maps
 FL State Archives/photo collection city directory occupant/owner interview plat maps
 property appraiser / tax records newspaper files neighbor interview Public Lands Survey (DEP)
 cultural resource survey (CRAS) historic photos interior inspection HABS/HAER record search
 other methods (describe) _____

Bibliographic References (give FMSF manuscript # if relevant, use continuation sheet if needed) See continuation sheet

OPINION OF RESOURCE SIGNIFICANCE

Appears to meet the criteria for National Register listing individually? yes no insufficient information

Appears to meet the criteria for National Register listing as part of a district? yes no insufficient information

Explanation of Evaluation (required, whether significant or not; use separate sheet if needed) Although NASA owns these railcars, they were not a significant contributor to any U.S. manned space program; therefore, they are not considered individually eligible for the NRHP, nor are they considered contributing to the NASA KSC Railroad HD.

Area(s) of Historical Significance (see *National Register Bulletin 15*, p. 8 for categories: e.g. "architecture", "ethnic heritage", "community planning & development", etc.)

1. Other 3. _____ 5. _____
 2. Transportation 4. _____ 6. _____

DOCUMENTATION

Accessible Documentation Not Filed with the Site File - including field notes, analysis notes, photos, plans and other important documents

1) Document type All materials at one location Maintaining organization Archaeological Consultants Inc
 Document description _____ File or accession #'s P9026Q

2) Document type _____ Maintaining organization _____
 Document description _____ File or accession #'s _____

RECORDER INFORMATION

Recorder Name Christopher Berger Affiliation Archaeological Consultants Inc

Recorder Contact Information 8110 Blaikie Court, Suite A, Sarasota, FL 34240/941-379-6206/ACIFlorida@comcast.net
 (address / phone / fax / e-mail)

Required Attachments

- ① USGS 7.5' MAP WITH STRUCTURE LOCATION PINPOINTED IN RED
- ② LARGE SCALE STREET, PLAT OR PARCEL MAP (available from most property appraiser web sites)
- ③ PHOTO OF MAIN FACADE, ARCHIVAL B&W PRINT OR DIGITAL IMAGE FILE

If submitting an image file, it must be included on disk or CD AND in hard copy format (plain paper is acceptable).
 Digital image must be at least 1600 x 1200 pixels, 24-bit color, jpeg or tiff.

CONTINUATION SHEET**Narrative Description:**

NLAX 122 and NLAX 123 are both 90' flat railroad cars with heavy chain tie down capability within the NASA Kennedy Space Center Railroad System. The steel flatcars have four axles and a cushioned underframe. The decks of each car are cut out in the middle, and rectangular bulkheads are situated at both ends. Metal tanks are located in the middle of the railcars, just below the underdeck. Each car contains as many as 16 winches.

NLAX 122 and NLAX 123 were built by Pullman in 1961 and owned by Western Pacific. NLAX 122 had the number WP 85014, and NLAX 123 had WP 85042 (KSC-TO 1987). NASA bought the two cars for \$5,300 each from Ortner Freight Car Co. in September 1982, and Ortner subsequently won the contract to modify the cars. The cars were used to transport large structural items, vehicles, and containers (KSC-TO, Folder Blue Ox Special Hopper Pullman Standard 1976; Formerly PLCX 81). In summer 1984, NLAX 122 and NLAX 123 carried the 60X vent launch complex access arm from KSC to Vandenberg Air Force Base in California, which was under construction at the time (KSC Archives, Folder No. 6630-19).

Bibliographic References:

NASA KSC, Archives Department

Var. Box 1, Folder No. 6630-19: 60X Vent Arm to VAFB

NASA KSC, Transportation Office (KSC-TO)

1987 NASA Railroad Equipment Listing. August 10.

Var. Folder No. Blue Ox Special Hopper Pullman Standard 1976; Formerly PLCX 81



PHOTOGRAPHS



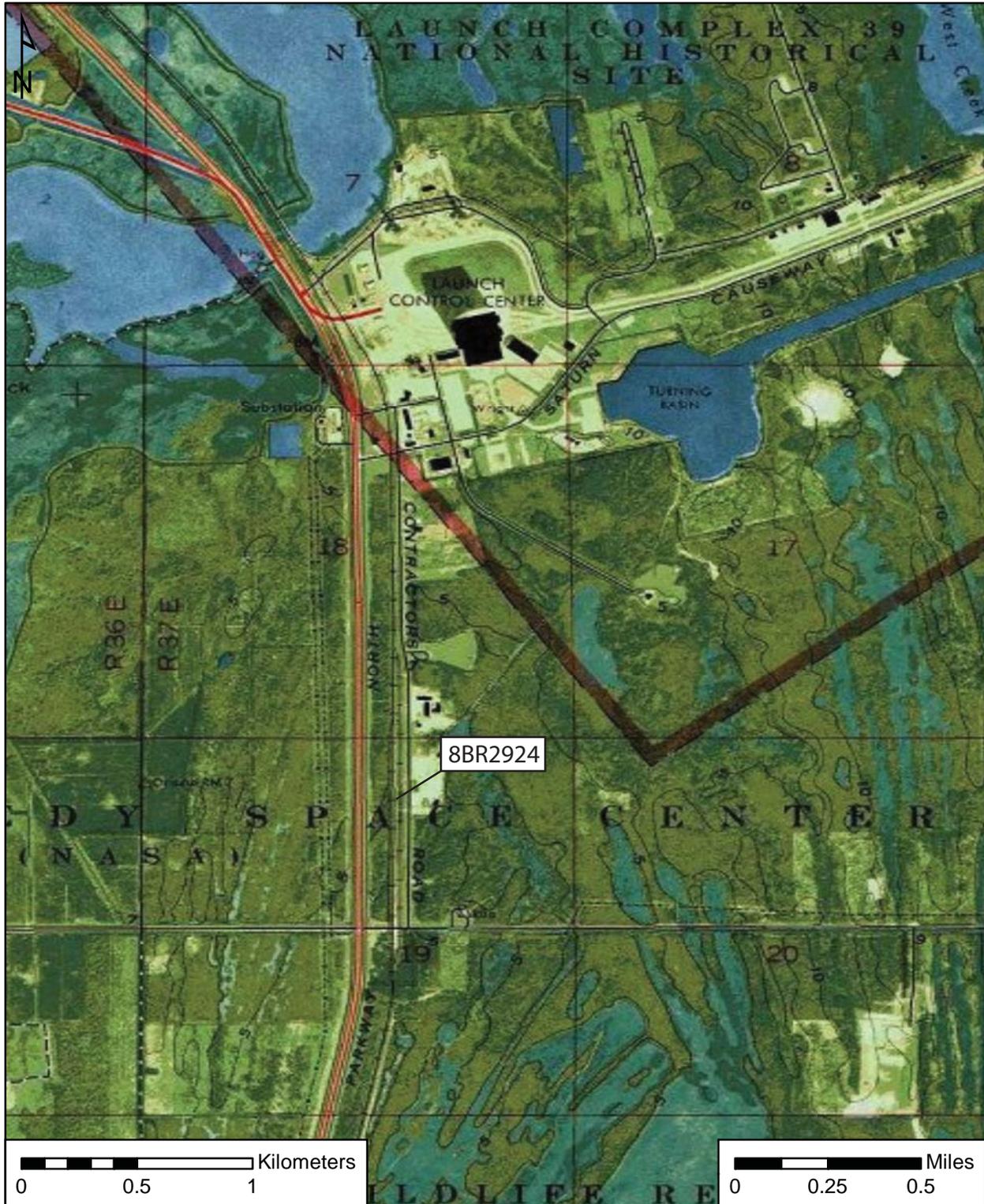
NLAX 122, 90-Foot Flat



USGS

Orsino

Township 22 South, Range 37 East, Section 19
National Geographic Society (2011) USA Topo Maps.



Original
 Update



HISTORICAL STRUCTURE FORM

FLORIDA MASTER SITE FILE

Version 4.0 1/07

Site #8 **BR02925**
Field Date 1-24-2012
Form Date 2-9-2012
Recorder # 20

Shaded Fields represent the minimum acceptable level of documentation.
Consult the *Guide to Historical Structure Forms* for detailed instructions.

Site Name(s) (address if none) NLAX 160; NLAX 161 Multiple Listing (DHR only) _____
Survey Project Name Historic Survey of NASA Railroad System Survey # (DHR only) _____
National Register Category (please check one) building structure district site object
Ownership: private-profit private-nonprofit private-individual private-nonspecific city county state federal Native American foreign unknown

LOCATION & MAPPING

Address: Contractor Street Number _____ Direction _____ Street Name _____ Street Type Road Suffix Direction _____
Cross Streets (nearest / between) Schwartz Road and Saturn Causeway
USGS 7.5 Map Name ORSINO USGS Date 1976 Plat or Other Map _____
City / Town (within 3 miles) Titusville In City Limits? yes no unknown County Brevard
Township 22S Range 37E Section 19 1/4 section: NW SW SE NE Irregular-name: _____
Tax Parcel # Not applicable Landgrant _____
Subdivision Name _____ Block _____ Lot _____
UTM Coordinates: Zone 16 17 Easting 533794 Northing 3160101
Other Coordinates: X: _____ Y: _____ Coordinate System & Datum _____
Name of Public Tract (e.g., park) _____

HISTORY

Construction Year: 1967 approximately year listed or earlier year listed or later
Original Use Other From (year): 1967 To (year): cur
Current Use Other From (year): _____ To (year): _____
Other Use Railcar From (year): _____ To (year): _____
Moves: yes no unknown Date: _____ Original address _____
Alterations: yes no unknown Date: _____ Nature See continuation sheet
Additions: yes no unknown Date: _____ Nature _____
Architect (last name first): _____ Builder (last name first): Atchison, Topeka, & Sante Fe
Ownership History (especially original owner, dates, profession, etc.) Atchison, Topeka, & Sante Fe Railway Company 1967-1983; NASA, 1983-present
Is the Resource Affected by a Local Preservation Ordinance? yes no unknown Describe _____

DESCRIPTION

Style Not applicable Exterior Plan Not applicable Number of Stories NA
Exterior Fabric(s) 1. Steel 2. _____ 3. _____
Roof Type(s) 1. _____ 2. _____ 3. _____
Roof Material(s) 1. _____ 2. _____ 3. _____
Roof secondary strucs. (dormers etc.) 1. _____ 2. _____
Windows (types, materials, etc.) _____
Distinguishing Architectural Features (exterior or interior ornaments) _____
Ancillary Features / Outbuildings (record outbuildings, major landscape features; use continuation sheet if needed.) _____

DHR USE ONLY		OFFICIAL EVALUATION		DHR USE ONLY	
NR List Date _____	SHPO – Appears to meet criteria for NR listing: <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> insufficient info	Date _____	Init. _____		
<input type="checkbox"/> Owner Objection	KEEPER – Determined eligible: <input type="checkbox"/> yes <input type="checkbox"/> no	Date _____			
	NR Criteria for Evaluation: <input type="checkbox"/> a <input type="checkbox"/> b <input type="checkbox"/> c <input type="checkbox"/> d (see <i>National Register Bulletin 15</i> , p. 2)				

DESCRIPTION (continued)

Chimney: No. ___ Chimney Material(s): 1. ___ 2. ___
Structural System(s): 1. ___ 2. ___ 3. ___
Foundation Type(s): 1. ___ 2. ___
Foundation Material(s): 1. ___ 2. ___
Main Entrance (stylistic details) ___

Porch Descriptions (types, locations, roof types, etc.) ___

Condition (overall resource condition): [] excellent [] good [x] fair [] deteriorated [] ruinous

Narrative Description of Resource See continuation sheet

Archaeological Remains ___ [] Check if Archaeological Form Completed

RESEARCH METHODS (check all that apply)

- [x] FMSF record search (sites/surveys) [x] library research [] building permits [] Sanborn maps
[] FL State Archives/photo collection [] city directory [x] occupant/owner interview [] plat maps
[] property appraiser / tax records [x] newspaper files [] neighbor interview [] Public Lands Survey (DEP)
[] cultural resource survey (CRAS) [x] historic photos [x] interior inspection [] HABS/HAER record search
[] other methods (describe) ___

Bibliographic References (give FMSF manuscript # if relevant, use continuation sheet if needed) See continuation sheet

OPINION OF RESOURCE SIGNIFICANCE

Appears to meet the criteria for National Register listing individually? [] yes [x] no [] insufficient information

Appears to meet the criteria for National Register listing as part of a district? [] yes [x] no [] insufficient information

Explanation of Evaluation (required, whether significant or not; use separate sheet if needed) Although NASA owns these railcars, they were not a significant contributor to any U.S. manned space program; therefore, they are not considered individually eligible for the NRHP, nor are they considered contributing to the NASA KSC Railroad HD.

Area(s) of Historical Significance (see National Register Bulletin 15, p. 8 for categories: e.g. "architecture", "ethnic heritage", "community planning & development", etc.)

- 1. Other 3. 5.
2. Transportation 4. 6.

DOCUMENTATION

Accessible Documentation Not Filed with the Site File - including field notes, analysis notes, photos, plans and other important documents

- 1) Document type All materials at one location Maintaining organization Archaeological Consultants Inc
Document description File or accession #'s P9026Q
2) Document type Maintaining organization
Document description File or accession #'s

RECORDER INFORMATION

Recorder Name Christopher Berger Affiliation Archaeological Consultants Inc

Recorder Contact Information 8110 Blaikie Court, Suite A, Sarasota, FL 34240/941-379-6206/ACIFlorida@comcast.net
(address / phone / fax / e-mail)

Required Attachments
1 USGS 7.5' MAP WITH STRUCTURE LOCATION PINPOINTED IN RED
2 LARGE SCALE STREET, PLAT OR PARCEL MAP (available from most property appraiser web sites)
3 PHOTO OF MAIN FACADE, ARCHIVAL B&W PRINT OR DIGITAL IMAGE FILE
If submitting an image file, it must be included on disk or CD AND in hard copy format (plain paper is acceptable). Digital image must be at least 1600 x 1200 pixels, 24-bit color, jpeg or tiff.

CONTINUATION SHEET

Narrative Description:

NLAX 160 and NLAX 161 are 90' flat railroad cars within the NASA Kennedy Space Center (KSC) Railroad System. They were modified to transport orbiter convoy purge and cooling tractor-trailer units in support of the Space Shuttle Program (Hoffman 2012). The steel flatcars are 90' long, 9'-4" wide, and 3'-6" high. They have two axles and cushioned underframes (KSC-TO, Folder No. 6630-10).

NLAX 160 weighs 90 tons and has handrails and a short ladder at one end. NLAX 161 weighs 70 tons and has a pair of metal tanks below the underframe and truck ramps at one end (KSC-TO, Folder No. 6670-5-160). The railcars were both built by the Atchison, Topeka, & Sante Fe Railway Company in 1967 to transport Ford automobile frames; NLAX 160 was ATSF 299970, and NLAX 161 was ATSF 299977 (KSC TO 1987). NASA leased the cars from ATSF at the beginning of the Space Shuttle Program, and the owner modified them for \$7,317.41 in 1981 so they could be used to transport the purge and cooling units (KSC-TO, Folder No. 6670-5-160).

In 1982, NASA used NLAX 160-161 to haul the units from the KSC to the White Sands Space Harbor after the completion of STS-3, the only shuttle landing at that site (Hoffman 2012). In 1983, ATSF sold NLAX 160 and NLAX 161 to NASA for \$18,500 each (KSC-TO, Folder No. 6670-5-160). In 1990, NLAX 160 was painted "NASA Blue" and extra wide bridgeplates were installed on it. NLAX 161 also was repainted and received extra wide bridgeplates. Furthermore, new trucks were installed (KSC-TO, Folder No. 6670-5-161). The two trailers loaded onto NLAX 161 were reportedly part of the "Langley Project," a hypersonic wind tunnel initiative dating to the Reagan administration (Crews 2012).

Bibliographic References:

Crews, Jesse (KSC Railroad technician).

2012 Interview by Christopher Berger, January 25. Notes on file at Archaeological Consultants, Inc.

Hoffman, Dave (retired NASA Railroad Manager).

2012 Interview by Christopher Berger and Patricia Slovinac, February 27. Notes on file at Archaeological Consultants, Inc.

NASA KSC, Transportation Office (KSC-TO)

1987 NASA Railroad Equipment Listing. August 10.

Var Folder No. 6630-10

Var. Folder No. 6670-5-160: Special Car for Cooling Unit; NLAX 160

Var. Folder No. 6670-5-161: 89' Chain Tiedown Special, NLAX 161



PHOTOGRAPHS



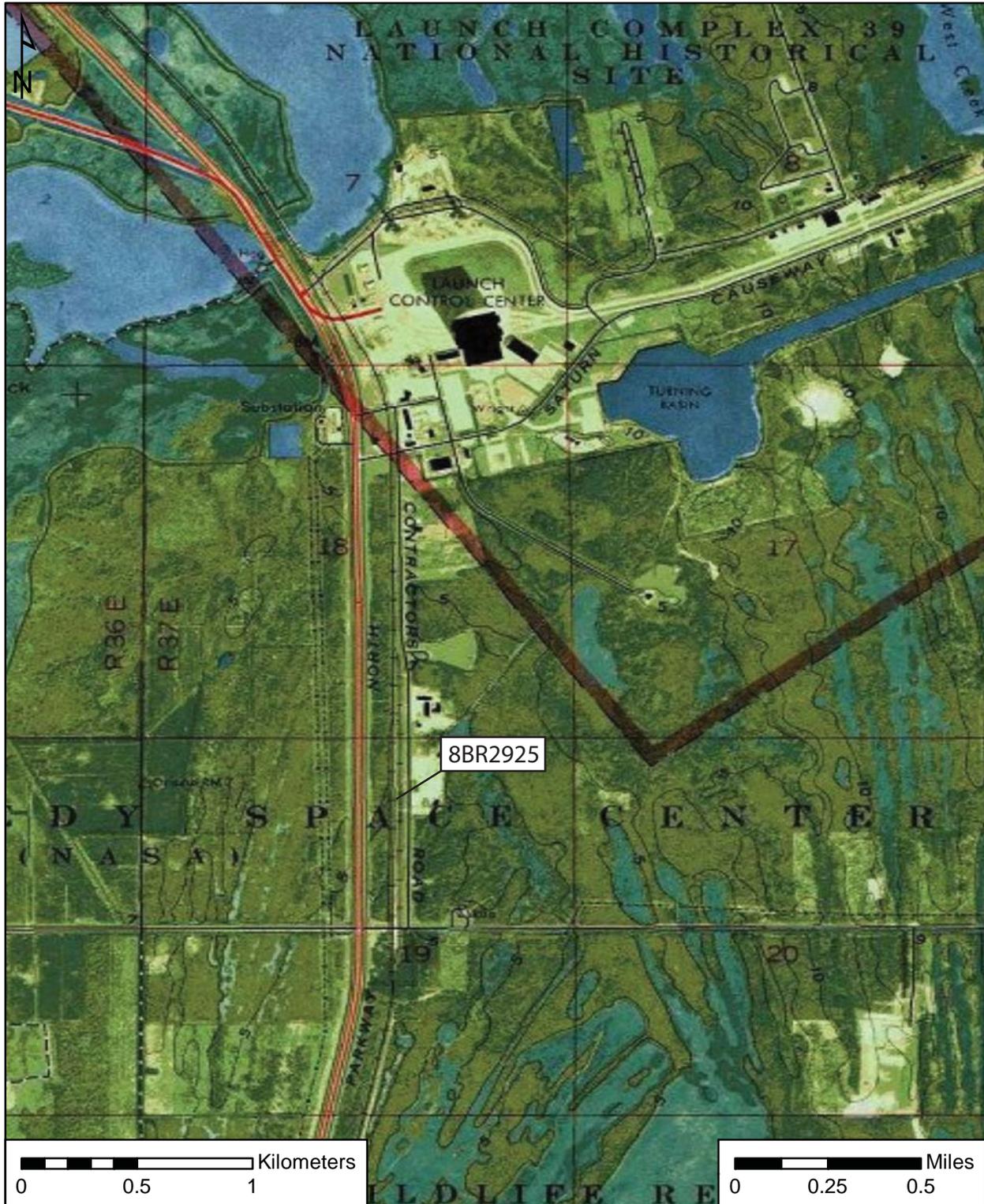
NLAX 161, 90-Foot Flat



USGS

Orsino

Township 22 South, Range 37 East, Section 19
National Geographic Society (2011) *USA Topo Maps*.



Original
 Update



HISTORICAL STRUCTURE FORM

FLORIDA MASTER SITE FILE

Version 4.0 1/07

Site #8 **BR02926**
Field Date 1-24-2012
Form Date 2-9-2012
Recorder # 21

Shaded Fields represent the minimum acceptable level of documentation.
Consult the *Guide to Historical Structure Forms* for detailed instructions.

Site Name(s) (address if none) NLAX 162, NLAX 163 Multiple Listing (DHR only) _____
Survey Project Name Historic Survey of NASA Railroad System Survey # (DHR only) _____
National Register Category (please check one) building structure district site object
Ownership: private-profit private-nonprofit private-individual private-nonspecific city county state federal Native American foreign unknown

LOCATION & MAPPING

Address: Contractor Street Number _____ Direction _____ Street Name _____ Street Type Road Suffix Direction _____
Cross Streets (nearest / between) Schwartz Road and Saturn Causeway
USGS 7.5 Map Name ORSINO USGS Date 1976 Plat or Other Map _____
City / Town (within 3 miles) Titusville In City Limits? yes no unknown County Brevard
Township 22S Range 37E Section 19 1/4 section: NW SW SE NE Irregular-name: _____
Tax Parcel # Not applicable Landgrant _____
Subdivision Name _____ Block _____ Lot _____
UTM Coordinates: Zone 16 17 Easting 533794 Northing 3160101
Other Coordinates: X: _____ Y: _____ Coordinate System & Datum _____
Name of Public Tract (e.g., park) _____

HISTORY

Construction Year: 1973 approximately year listed or earlier year listed or later
Original Use Other From (year): 1973 To (year): cur
Current Use Other From (year): _____ To (year): _____
Other Use Railcar From (year): _____ To (year): _____
Moves: yes no unknown Date: _____ Original address _____
Alterations: yes no unknown Date: _____ Nature _____
Additions: yes no unknown Date: _____ Nature _____
Architect (last name first): _____ Builder (last name first): See continuation sheet
Ownership History (especially original owner, dates, profession, etc.) Atkinson, Topeka, and Sante Fe Railway, unknown-1983; NASA, 1983-present
Is the Resource Affected by a Local Preservation Ordinance? yes no unknown Describe _____

DESCRIPTION

Style Not applicable Exterior Plan Not applicable Number of Stories NA
Exterior Fabric(s) 1. Steel 2. _____ 3. _____
Roof Type(s) 1. _____ 2. _____ 3. _____
Roof Material(s) 1. _____ 2. _____ 3. _____
Roof secondary strucs. (dormers etc.) 1. _____ 2. _____
Windows (types, materials, etc.) _____
Distinguishing Architectural Features (exterior or interior ornaments) _____
Ancillary Features / Outbuildings (record outbuildings, major landscape features; use continuation sheet if needed.) _____

DHR USE ONLY		OFFICIAL EVALUATION		DHR USE ONLY	
NR List Date _____	SHPO – Appears to meet criteria for NR listing: <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> insufficient info	Date _____	Init. _____		
<input type="checkbox"/> Owner Objection	KEEPER – Determined eligible: <input type="checkbox"/> yes <input type="checkbox"/> no	Date _____			
	NR Criteria for Evaluation: <input type="checkbox"/> a <input type="checkbox"/> b <input type="checkbox"/> c <input type="checkbox"/> d (see <i>National Register Bulletin 15</i> , p. 2)				

DESCRIPTION (continued)

Chimney: No. _____ Chimney Material(s): 1. _____ 2. _____
 Structural System(s): 1. _____ 2. _____ 3. _____
 Foundation Type(s): 1. _____ 2. _____
 Foundation Material(s): 1. _____ 2. _____
 Main Entrance (stylistic details) _____

Porch Descriptions (types, locations, roof types, etc.) _____

Condition (overall resource condition): excellent good fair deteriorated ruinous

Narrative Description of Resource See continuation sheet

Archaeological Remains _____ Check if Archaeological Form Completed

RESEARCH METHODS (check all that apply)

FMSF record search (sites/surveys) library research building permits Sanborn maps
 FL State Archives/photo collection city directory occupant/owner interview plat maps
 property appraiser / tax records newspaper files neighbor interview Public Lands Survey (DEP)
 cultural resource survey (CRAS) historic photos interior inspection HABS/HAER record search
 other methods (describe) _____

Bibliographic References (give FMSF manuscript # if relevant, use continuation sheet if needed) See continuation sheet

OPINION OF RESOURCE SIGNIFICANCE

Appears to meet the criteria for National Register listing individually? yes no insufficient information

Appears to meet the criteria for National Register listing as part of a district? yes no insufficient information

Explanation of Evaluation (required, whether significant or not; use separate sheet if needed) Although NASA owns these railcars, they were not a significant contributor to any U.S. manned space program; therefore, they are not considered individually eligible for the NRHP, nor are they considered contributing to the NASA KSC Railroad HD.

Area(s) of Historical Significance (see *National Register Bulletin 15*, p. 8 for categories: e.g. "architecture", "ethnic heritage", "community planning & development", etc.)

1. Other 3. _____ 5. _____
 2. Transportation 4. _____ 6. _____

DOCUMENTATION

Accessible Documentation Not Filed with the Site File - including field notes, analysis notes, photos, plans and other important documents

1) Document type All materials at one location Maintaining organization Archaeological Consultants Inc
 Document description _____ File or accession #'s P9026Q
 2) Document type _____ Maintaining organization _____
 Document description _____ File or accession #'s _____

RECORDER INFORMATION

Recorder Name Christopher Berger Affiliation Archaeological Consultants Inc

Recorder Contact Information 8110 Blaikie Court, Suite A, Sarasota, FL 34240/941-379-6206/ACIFlorida@comcast.net
 (address / phone / fax / e-mail)

Required Attachments

- ① USGS 7.5' MAP WITH STRUCTURE LOCATION PINPOINTED IN RED
- ② LARGE SCALE STREET, PLAT OR PARCEL MAP (available from most property appraiser web sites)
- ③ PHOTO OF MAIN FACADE, ARCHIVAL B&W PRINT OR DIGITAL IMAGE FILE

If submitting an image file, it must be included on disk or CD AND in hard copy format (plain paper is acceptable).
 Digital image must be at least 1600 x 1200 pixels, 24-bit color, jpeg or tiff.

CONTINUATION SHEET**Narrative Description:**

NLAX 162 and NLAX 163 are 90' flat railroad cars that are part of the NASA Kennedy Space Center Railroad System. The steel flatcars sit on two axles with a cushioned underframe, and both cars have handrails at all four corners.

NLAX 162 is described on an August 10, 1987, inventory as a 175', 100-ton flat car with chain tiedown capabilities to transport vehicles, but NLAX 162 now appears to be a 90' flat car. The inventory indicates it was built by Bethlehem in 1969 and 1973; therefore, it is likely two cars were used to create NLAX 162 (KSC-TO 1987). The previous numbers for the cars are SP 900317 and RTTX 159676, and records indicate it was purchased by NASA for about \$4,000 in January 1983 from Atkinson, Topeka, and Sante Fe Railway (KSC-TO, Folder No. 6670-5-162).

NLAX 163 is also described as having chain tiedown capabilities in the 1987 inventory, where it was listed as a 70-ton flatcar, but no information is available about when it was built and its previous numbers. Records indicate it was purchased for about \$4,000 in January 1983 from Atkinson, Topeka, and Sante Fe Railway (KSC-TO, Folder No. 6670-5-162). There are three trailers loaded onto NLAX 163 that were reportedly part of the "Langley Project," a hypersonic wind tunnel initiative dating to the Reagan administration (Crews 2012).

Bibliographic References:

Crews, Jesse (KSC Railroad technician).

2012 Interview by Christopher Berger, January 25. Notes on file at Archaeological Consultants Inc.

NASA KSC, Transportation Office (KSC-TO)

1987 NASA Railroad Equipment Listing. August 10.

2001 Folder No. 6670-5-162: NLAX 162

2001 Folder No. 6670-5-163



PHOTOGRAPHS



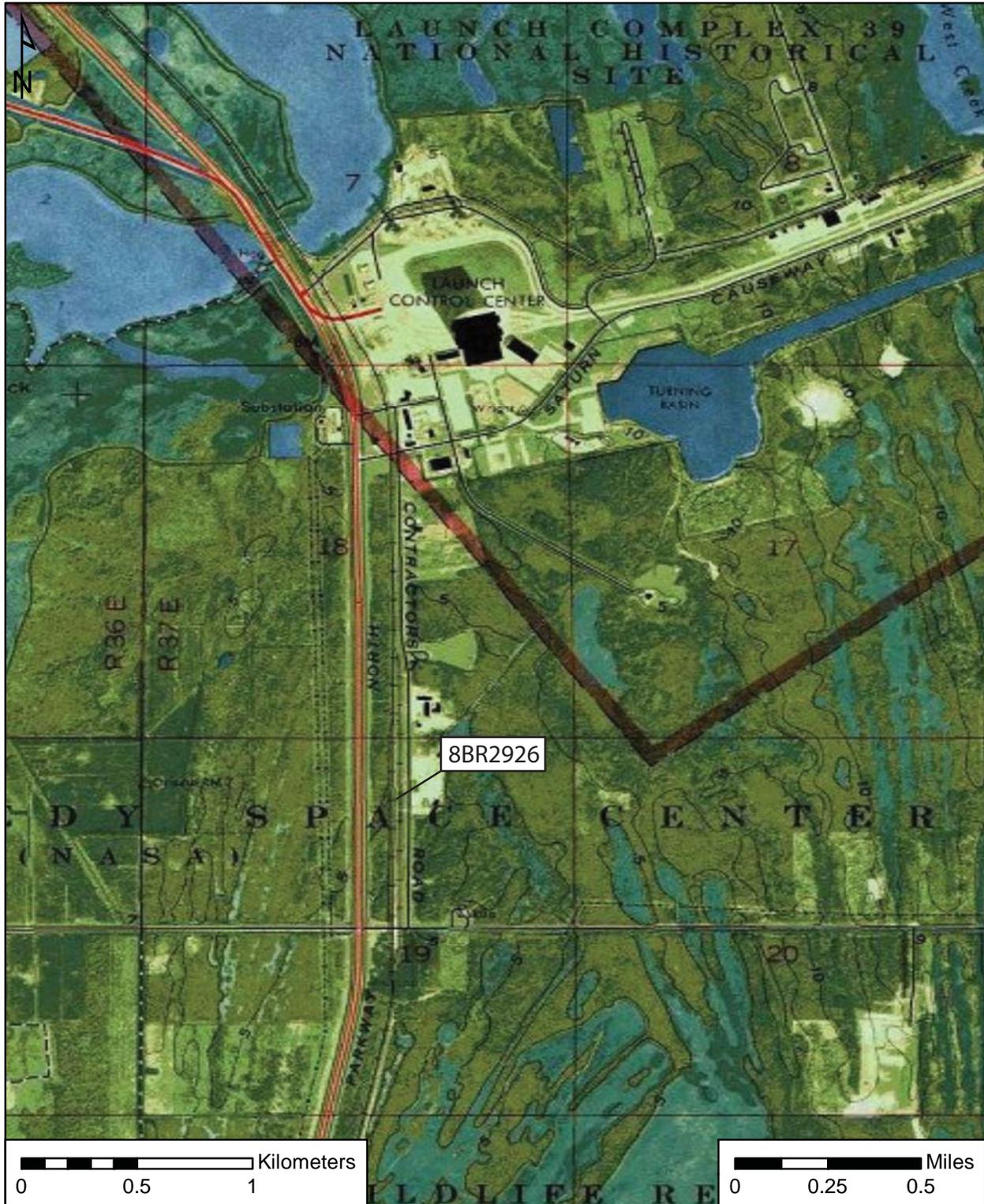
NLAX 162, 90-Foot Flat



USGS

Orsino

Township 22 South, Range 37 East, Section 19
National Geographic Society (2011) USA Topo Maps.



Original
 Update



HISTORICAL STRUCTURE FORM

FLORIDA MASTER SITE FILE

Version 4.0 1/07

Site #8 **BR02927**
Field Date 1-24-2012
Form Date 2-14-2012
Recorder # 22

Shaded Fields represent the minimum acceptable level of documentation.
Consult the *Guide to Historical Structure Forms* for detailed instructions.

Site Name(s) (address if none) NLAX 914 Multiple Listing (DHR only) _____
Survey Project Name Historic Survey of NASA Railroad System Survey # (DHR only) _____
National Register Category (please check one) building structure district site object
Ownership: private-profit private-nonprofit private-individual private-nonspecific city county state federal Native American foreign unknown

LOCATION & MAPPING

Address: Contractor Street Number _____ Direction _____ Street Name _____ Street Type Road Suffix Direction _____
Cross Streets (nearest / between) Schwartz Road and Saturn Causeway
USGS 7.5 Map Name ORSINO USGS Date 1976 Plat or Other Map _____
City / Town (within 3 miles) Titusville In City Limits? yes no unknown County Brevard
Township 22S Range 37E Section 19 1/4 section: NW SW SE NE Irregular-name: _____
Tax Parcel # Not applicable Landgrant _____
Subdivision Name _____ Block _____ Lot _____
UTM Coordinates: Zone 16 17 Easting 533794 Northing 3160101
Other Coordinates: X: _____ Y: _____ Coordinate System & Datum _____
Name of Public Tract (e.g., park) _____

HISTORY

Construction Year: 1964 approximately year listed or earlier year listed or later
Original Use Other From (year): 1964 To (year): curr
Current Use Other From (year): _____ To (year): _____
Other Use Railcar From (year): _____ To (year): _____
Moves: yes no unknown Date: _____ Original address _____
Alterations: yes no unknown Date: _____ Nature _____
Additions: yes no unknown Date: _____ Nature _____
Architect (last name first): _____ Builder (last name first): Bethlehem
Ownership History (especially original owner, dates, profession, etc.) Burlington Northern, dates unknown. CSX, dates unknown. NASA, unknown to present
Is the Resource Affected by a Local Preservation Ordinance? yes no unknown Describe _____

DESCRIPTION

Style Not applicable Exterior Plan Not applicable Number of Stories NA
Exterior Fabric(s) 1. Steel 2. _____ 3. _____
Roof Type(s) 1. _____ 2. _____ 3. _____
Roof Material(s) 1. _____ 2. _____ 3. _____
Roof secondary strucs. (dormers etc.) 1. _____ 2. _____
Windows (types, materials, etc.) _____
Distinguishing Architectural Features (exterior or interior ornaments) _____
Ancillary Features / Outbuildings (record outbuildings, major landscape features; use continuation sheet if needed.) _____

DHR USE ONLY		OFFICIAL EVALUATION		DHR USE ONLY	
NR List Date _____	SHPO – Appears to meet criteria for NR listing: <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> insufficient info	Date _____	Init. _____		
<input type="checkbox"/> Owner Objection	KEEPER – Determined eligible: <input type="checkbox"/> yes <input type="checkbox"/> no	Date _____			
	NR Criteria for Evaluation: <input type="checkbox"/> a <input type="checkbox"/> b <input type="checkbox"/> c <input type="checkbox"/> d (see <i>National Register Bulletin 15</i> , p. 2)				

DESCRIPTION (continued)

Chimney: No. ____ Chimney Material(s): 1. _____ 2. _____
 Structural System(s): 1. _____ 2. _____ 3. _____
 Foundation Type(s): 1. _____ 2. _____
 Foundation Material(s): 1. _____ 2. _____
 Main Entrance (stylistic details) _____

Porch Descriptions (types, locations, roof types, etc.) _____

Condition (overall resource condition): excellent good fair deteriorated ruinous

Narrative Description of Resource See continuation sheet

Archaeological Remains _____ Check if Archaeological Form Completed

RESEARCH METHODS (check all that apply)

FMSF record search (sites/surveys) library research building permits Sanborn maps
 FL State Archives/photo collection city directory occupant/owner interview plat maps
 property appraiser / tax records newspaper files neighbor interview Public Lands Survey (DEP)
 cultural resource survey (CRAS) historic photos interior inspection HABS/HAER record search
 other methods (describe) _____

Bibliographic References (give FMSF manuscript # if relevant, use continuation sheet if needed) See continuation sheet

OPINION OF RESOURCE SIGNIFICANCE

Appears to meet the criteria for National Register listing individually? yes no insufficient information

Appears to meet the criteria for National Register listing as part of a district? yes no insufficient information

Explanation of Evaluation (required, whether significant or not; use separate sheet if needed) Although NASA owns this railcar, it was not a significant contributor to any U.S. manned space program; therefore, it is not considered individually eligible for the NRHP, nor is it considered contributing to the NASA KSC Railroad System HD.

Area(s) of Historical Significance (see *National Register Bulletin 15*, p. 8 for categories: e.g. "architecture", "ethnic heritage", "community planning & development", etc.)

1. Other 3. _____ 5. _____
 2. Transportation 4. _____ 6. _____

DOCUMENTATION

Accessible Documentation Not Filed with the Site File - including field notes, analysis notes, photos, plans and other important documents

1) Document type All materials at one location Maintaining organization Archaeological Consultants Inc
 Document description _____ File or accession #'s P9026Q
 2) Document type _____ Maintaining organization _____
 Document description _____ File or accession #'s _____

RECORDER INFORMATION

Recorder Name Christopher Berger Affiliation Archaeological Consultants Inc

Recorder Contact Information 8110 Blaikie Court, Suite A, Sarasota, FL 34240/941-379-6206/ACIFlorida@comcast.net
 (address / phone / fax / e-mail)

Required Attachments

- ① USGS 7.5' MAP WITH STRUCTURE LOCATION PINPOINTED IN RED
- ② LARGE SCALE STREET, PLAT OR PARCEL MAP (available from most property appraiser web sites)
- ③ PHOTO OF MAIN FACADE, ARCHIVAL B&W PRINT OR DIGITAL IMAGE FILE

If submitting an image file, it must be included on disk or CD AND in hard copy format (plain paper is acceptable).
 Digital image must be at least 1600 x 1200 pixels, 24-bit color, jpeg or tiff.

CONTINUATION SHEET**Narrative Description:**

NLAX 914 is a 100-ton, triple-hopper railroad car within the NASA Kennedy Space Center Railroad System; it is solely used for parts (Crews 2012). The car is approximately 45' long, sits on four axles, and has three hopper doors. The side sheets are 8'-9" tall, and the railcar has a maximum volume of 3,600 cubic feet.

NLAX 914 was built in February 1968 by Bethlehem and was once owned by Burlington Northern with the numbers BN 523098. When it was purchased by NASA, it had the numbers CSXT 340209, and markings indicate it was once part of the Seaboard System. Bought at the same time as NLAX 913, which has unknown whereabouts, NLAX 914 was initially numbered NLAX 114 (KSC-TO, Folder No. 6670-5-109). The other 100 ton triple-hopper railcars were used to haul track ballast and other aggregates used in the maintenance of the Kennedy Space Center, but NLAX 914 was used for parts—as indicated in the August 10, 1987, NASA railcar inventory—because its carbody was found to be in poor condition (KSC-TO 1987).

Bibliographic References:

Crews, Jesse (KSC Railroad technician)

2012 Interview by Christopher Berger, January 25. Notes on file at Archaeological Consultants Inc.

NASA KSC, Transportation Office (KSC-TO)

1987 NASA Railroad Equipment Listing. August 10.
Var. Folder No. 6670-5-109



PHOTOGRAPHS



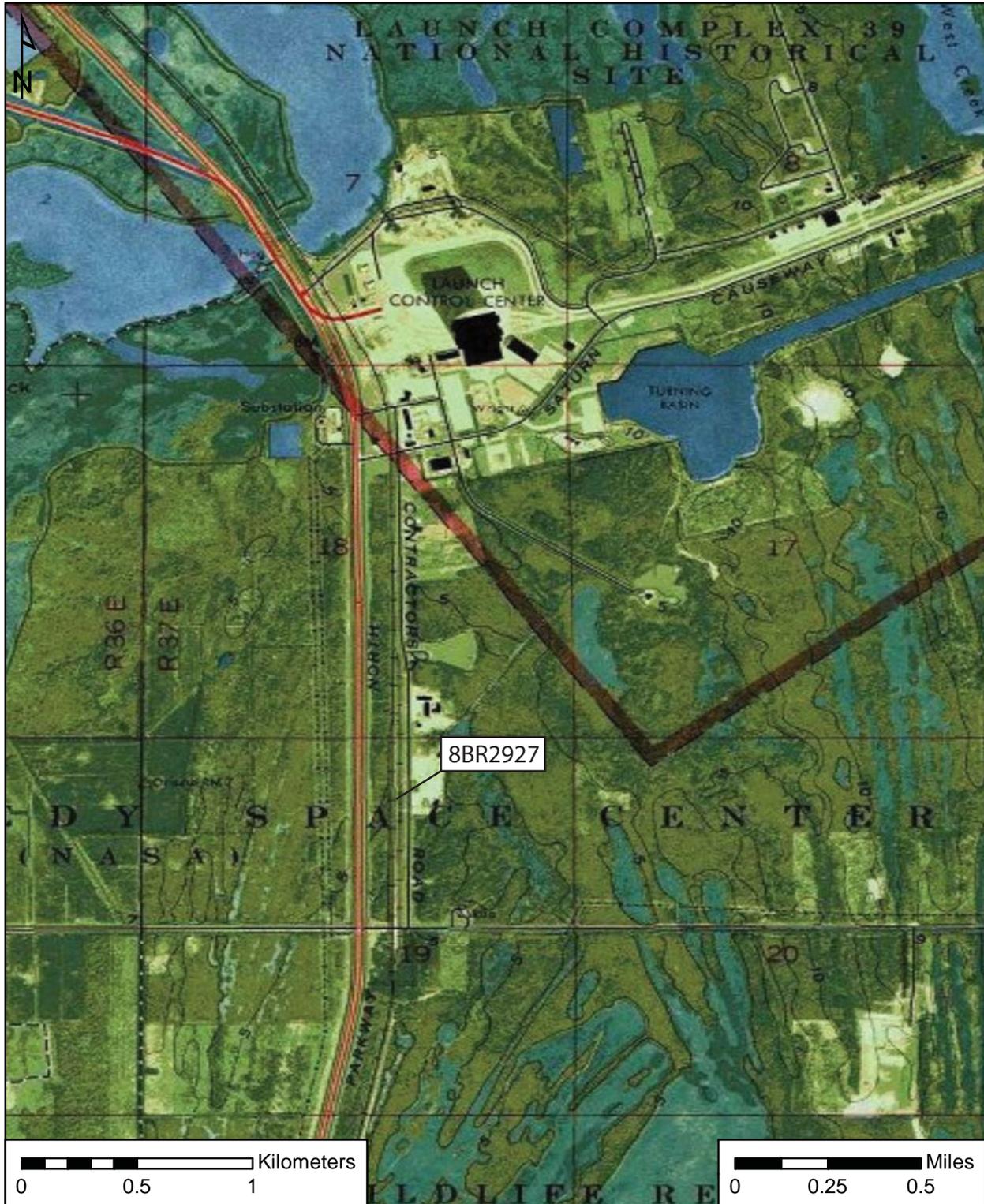
NLAX 914, 100-Ton Triple Hopper



USGS

Orsino

Township 22 South, Range 37 East, Section 19
National Geographic Society (2011) USA Topo Maps.



Original
 Update



HISTORICAL STRUCTURE FORM

FLORIDA MASTER SITE FILE

Version 4.0 1/07

Site #8 **BR02928**
Field Date 1-24-2012
Form Date 2-14-2012
Recorder # 23

Shaded Fields represent the minimum acceptable level of documentation.
Consult the *Guide to Historical Structure Forms* for detailed instructions.

Site Name(s) (address if none) NLAX 124 Multiple Listing (DHR only) _____
Survey Project Name Historic Survey of NASA Railroad System Survey # (DHR only) _____
National Register Category (please check one) building structure district site object
Ownership: private-profit private-nonprofit private-individual private-nonspecific city county state federal Native American foreign unknown

LOCATION & MAPPING

Address: Contractor Street Number _____ Direction _____ Street Name _____ Street Type Road Suffix Direction _____
Cross Streets (nearest / between) Schwartz Road and Saturn Causeway
USGS 7.5 Map Name ORSINO USGS Date 1976 Plat or Other Map _____
City / Town (within 3 miles) Titusville In City Limits? yes no unknown County Brevard
Township 22S Range 37E Section 19 1/4 section: NW SW SE NE Irregular-name: _____
Tax Parcel # Not applicable Landgrant _____
Subdivision Name _____ Block _____ Lot _____
UTM Coordinates: Zone 16 17 Easting 533794 Northing 3160101
Other Coordinates: X: _____ Y: _____ Coordinate System & Datum _____
Name of Public Tract (e.g., park) _____

HISTORY

Construction Year: 1967 approximately year listed or earlier year listed or later
Original Use Other From (year): 1967 To (year): cur
Current Use Other From (year): _____ To (year): _____
Other Use Railcar From (year): _____ To (year): _____
Moves: yes no unknown Date: _____ Original address _____
Alterations: yes no unknown Date: _____ Nature _____
Additions: yes no unknown Date: _____ Nature _____
Architect (last name first): _____ Builder (last name first): General Steel Industries
Ownership History (especially original owner, dates, profession, etc.) Chicago Pacific Corp./Rock Island Railroad, 1967-1984; NASA 1984-present
Is the Resource Affected by a Local Preservation Ordinance? yes no unknown Describe _____

DESCRIPTION

Style Not applicable Exterior Plan Not applicable Number of Stories NA
Exterior Fabric(s) 1. Steel 2. _____ 3. _____
Roof Type(s) 1. _____ 2. _____ 3. _____
Roof Material(s) 1. _____ 2. _____ 3. _____
Roof secondary strucs. (dormers etc.) 1. _____ 2. _____
Windows (types, materials, etc.) _____
Distinguishing Architectural Features (exterior or interior ornaments) _____
Ancillary Features / Outbuildings (record outbuildings, major landscape features; use continuation sheet if needed.) _____

DHR USE ONLY		OFFICIAL EVALUATION		DHR USE ONLY	
NR List Date _____	SHPO – Appears to meet criteria for NR listing: <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> insufficient info	Date _____	Init. _____		
<input type="checkbox"/> Owner Objection	KEEPER – Determined eligible: <input type="checkbox"/> yes <input type="checkbox"/> no	Date _____			
	NR Criteria for Evaluation: <input type="checkbox"/> a <input type="checkbox"/> b <input type="checkbox"/> c <input type="checkbox"/> d (see <i>National Register Bulletin 15</i> , p. 2)				

DESCRIPTION (continued)

Chimney: No. ____ Chimney Material(s): 1. _____ 2. _____
 Structural System(s): 1. _____ 2. _____ 3. _____
 Foundation Type(s): 1. _____ 2. _____
 Foundation Material(s): 1. _____ 2. _____
 Main Entrance (stylistic details) _____

Porch Descriptions (types, locations, roof types, etc.) _____

Condition (overall resource condition): excellent good fair deteriorated ruinous

Narrative Description of Resource See continuation sheet

Archaeological Remains _____ Check if Archaeological Form Completed

RESEARCH METHODS (check all that apply)

FMSF record search (sites/surveys) library research building permits Sanborn maps
 FL State Archives/photo collection city directory occupant/owner interview plat maps
 property appraiser / tax records newspaper files neighbor interview Public Lands Survey (DEP)
 cultural resource survey (CRAS) historic photos interior inspection HABS/HAER record search
 other methods (describe) _____

Bibliographic References (give FMSF manuscript # if relevant, use continuation sheet if needed) See continuation sheet

OPINION OF RESOURCE SIGNIFICANCE

Appears to meet the criteria for National Register listing individually? yes no insufficient information

Appears to meet the criteria for National Register listing as part of a district? yes no insufficient information

Explanation of Evaluation (required, whether significant or not; use separate sheet if needed) Although NASA owns this railcar, it was not a significant contributor to any U.S. manned space program; therefore, it is not considered individually eligible for the NRHP, nor is it considered contributing to the NASA KSC Railroad System HD.

Area(s) of Historical Significance (see *National Register Bulletin 15*, p. 8 for categories: e.g. "architecture", "ethnic heritage", "community planning & development", etc.)

1. Other 3. _____ 5. _____
 2. Transportation 4. _____ 6. _____

DOCUMENTATION

Accessible Documentation Not Filed with the Site File - including field notes, analysis notes, photos, plans and other important documents

1) Document type All materials at one location Maintaining organization Archaeological Consultants Inc
 Document description _____ File or accession #'s P9026Q
 2) Document type _____ Maintaining organization _____
 Document description _____ File or accession #'s _____

RECORDER INFORMATION

Recorder Name Christopher Berger Affiliation Archaeological Consultants Inc

Recorder Contact Information 8110 Blaikie Court, Suite A, Sarasota, FL 34240/941-379-6206/ACIFlorida@comcast.net
 (address / phone / fax / e-mail)

Required Attachments

- ① USGS 7.5' MAP WITH STRUCTURE LOCATION PINPOINTED IN RED
- ② LARGE SCALE STREET, PLAT OR PARCEL MAP (available from most property appraiser web sites)
- ③ PHOTO OF MAIN FACADE, ARCHIVAL B&W PRINT OR DIGITAL IMAGE FILE

If submitting an image file, it must be included on disk or CD AND in hard copy format (plain paper is acceptable).
 Digital image must be at least 1600 x 1200 pixels, 24-bit color, jpeg or tiff.

CONTINUATION SHEET**Narrative Description:**

NLAX 124 is the only 90-ton, 65'-bulk railroad flatcar within the NASA Kennedy Space Center Railroad System (KSC-TO 2011). The steel railcar sits on two axles and has two bulkheads at both ends with an unobstructed deck. It was built in 1967 by General Steel Industries and owned by the Rock Island Railroad with the number RI 92542. Used to haul lumber, it had a capacity of 170,000 pounds. It was purchased by NASA in late 1984 for \$3,000 from Chicago Pacific Corp., the surviving organization of the Rock Island Railroad. At the time of NASA's purchase, the car had been unused since March 1980 (KSC-TO, Folder No. 6670-5-124). It is unknown what it carried for NASA.

Bibliographic References:

NASA KSC, Transportation Office (KSC-TO)
2011 NASA Railroad Equipment Listing. July 21.
Var. Folder No. 6670-5-124



PHOTOGRAPHS



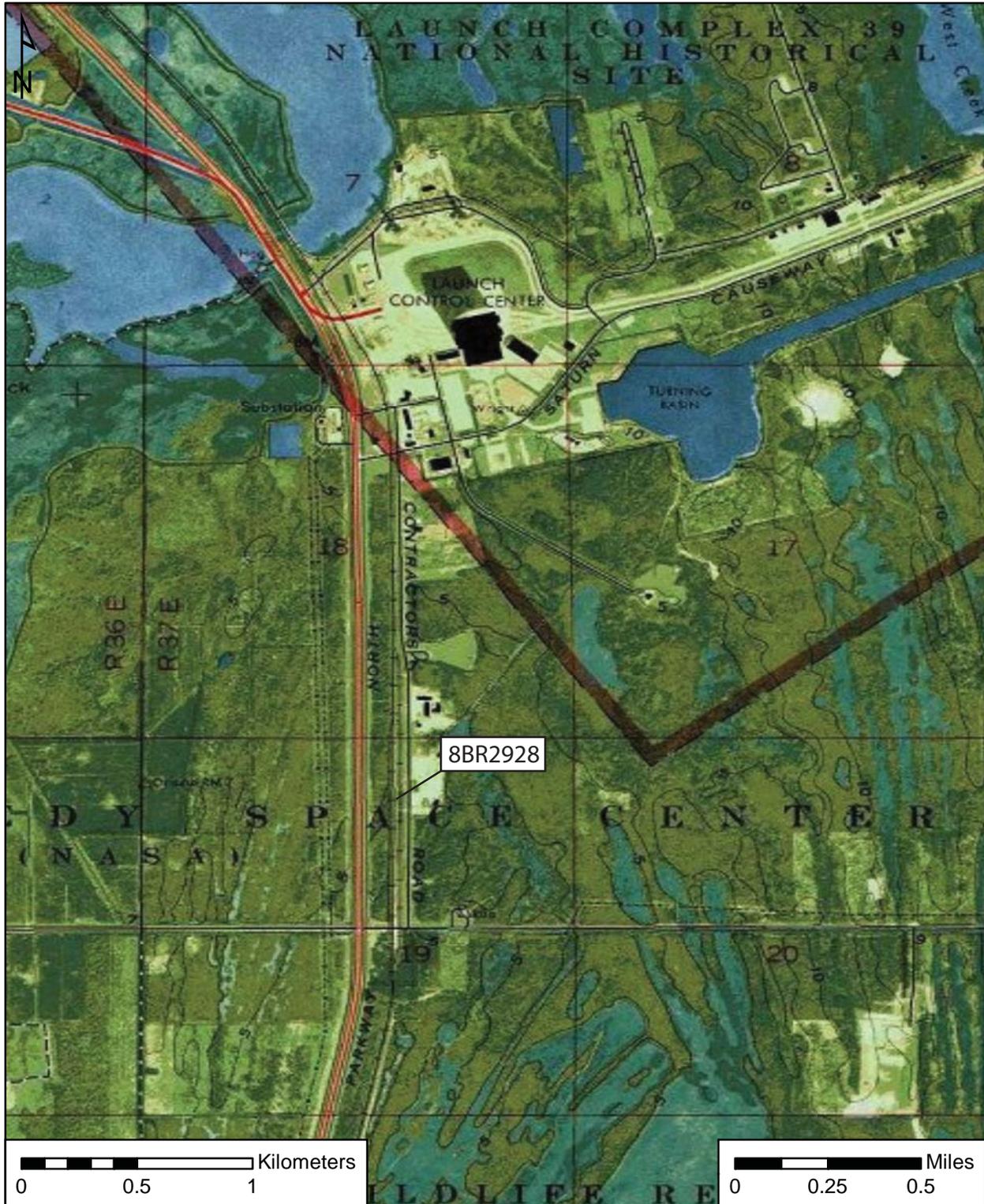
NLAX 124, 90-Ton, 65-Foot Flat



USGS

Orsino

Township 22 South, Range 37 East, Section 19
National Geographic Society (2011) *USA Topo Maps*.



Original
 Update



HISTORICAL STRUCTURE FORM

FLORIDA MASTER SITE FILE

Version 4.0 1/07

Site #8 **BR02929**
Field Date 1-24-2012
Form Date 2-15-2012
Recorder # 24

Shaded Fields represent the minimum acceptable level of documentation.
Consult the *Guide to Historical Structure Forms* for detailed instructions.

Site Name(s) (address if none) NLAX 177; NLAX 178; NLAX 179 Multiple Listing (DHR only) _____
Survey Project Name Historic Evaluation and Survey of Jay Jay Bridge Survey # (DHR only) _____
National Register Category (please check one) building structure district site object
Ownership: private-profit private-nonprofit private-individual private-nonspecific city county state federal Native American foreign unknown

LOCATION & MAPPING

Address: Contractor Street Number _____ Direction _____ Street Name _____ Street Type _____ Suffix Direction _____
Cross Streets (nearest / between) Schwartz Road and Saturn Causeway
USGS 7.5 Map Name ORSINO USGS Date 1976 Plat or Other Map _____
City / Town (within 3 miles) Titusville In City Limits? yes no unknown County Brevard
Township 22S Range 37E Section 19 1/4 section: NW SW SE NE Irregular-name: _____
Tax Parcel # Not applicable Landgrant _____
Subdivision Name _____ Block _____ Lot _____
UTM Coordinates: Zone 16 17 Easting 533794 Northing 3160101
Other Coordinates: X: _____ Y: _____ Coordinate System & Datum _____
Name of Public Tract (e.g., park) _____

HISTORY

Construction Year: 1966 approximately year listed or earlier year listed or later
Original Use Other From (year): 1966 To (year): cur
Current Use Other From (year): _____ To (year): _____
Other Use Railcar From (year): _____ To (year): _____
Moves: yes no unknown Date: _____ Original address _____
Alterations: yes no unknown Date: _____ Nature See continuation sheet
Additions: yes no unknown Date: _____ Nature _____
Architect (last name first): _____ Builder (last name first): See continuation sheet
Ownership History (especially original owner, dates, profession, etc.) See continuation sheet

Is the Resource Affected by a Local Preservation Ordinance? yes no unknown Describe _____

DESCRIPTION

Style Not applicable Exterior Plan Not applicable Number of Stories NA
Exterior Fabric(s) 1. Steel 2. _____ 3. _____
Roof Type(s) 1. _____ 2. _____ 3. _____
Roof Material(s) 1. _____ 2. _____ 3. _____
Roof secondary strucs. (dormers etc.) 1. _____ 2. _____
Windows (types, materials, etc.) _____

Distinguishing Architectural Features (exterior or interior ornaments) _____

Ancillary Features / Outbuildings (record outbuildings, major landscape features; use continuation sheet if needed.) _____

DHR USE ONLY		OFFICIAL EVALUATION		DHR USE ONLY	
NR List Date _____	SHPO – Appears to meet criteria for NR listing: <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> insufficient info	Date _____	Init. _____		
<input type="checkbox"/> Owner Objection	KEEPER – Determined eligible: <input type="checkbox"/> yes <input type="checkbox"/> no	Date _____			
	NR Criteria for Evaluation: <input type="checkbox"/> a <input type="checkbox"/> b <input type="checkbox"/> c <input type="checkbox"/> d (see <i>National Register Bulletin 15</i> , p. 2)				

DESCRIPTION (continued)

Chimney: No. _____ Chimney Material(s): 1. _____ 2. _____
 Structural System(s): 1. _____ 2. _____ 3. _____
 Foundation Type(s): 1. _____ 2. _____
 Foundation Material(s): 1. _____ 2. _____
 Main Entrance (stylistic details) _____

Porch Descriptions (types, locations, roof types, etc.) _____

Condition (overall resource condition): excellent good fair deteriorated ruinous

Narrative Description of Resource See continuation sheet

Archaeological Remains _____ Check if Archaeological Form Completed

RESEARCH METHODS (check all that apply)

FMSF record search (sites/surveys) library research building permits Sanborn maps
 FL State Archives/photo collection city directory occupant/owner interview plat maps
 property appraiser / tax records newspaper files neighbor interview Public Lands Survey (DEP)
 cultural resource survey (CRAS) historic photos interior inspection HABS/HAER record search
 other methods (describe) _____

Bibliographic References (give FMSF manuscript # if relevant, use continuation sheet if needed) See continuation sheet

OPINION OF RESOURCE SIGNIFICANCE

Appears to meet the criteria for National Register listing individually? yes no insufficient information

Appears to meet the criteria for National Register listing as part of a district? yes no insufficient information

Explanation of Evaluation (required, whether significant or not; use separate sheet if needed) Although NASA owns these railcars, they were not a significant contributor to any U.S. manned space program; therefore, they are not considered individually eligible for the NRHP, nor are they considered contributing to the NASA KSC Railroad HD.

Area(s) of Historical Significance (see *National Register Bulletin 15*, p. 8 for categories: e.g. "architecture", "ethnic heritage", "community planning & development", etc.)

1. Other 3. _____ 5. _____
 2. Transportation 4. _____ 6. _____

DOCUMENTATION

Accessible Documentation Not Filed with the Site File - including field notes, analysis notes, photos, plans and other important documents

- 1) Document type All materials at one location Maintaining organization Archaeological Consultants Inc
 Document description _____ File or accession #'s P9026Q
- 2) Document type _____ Maintaining organization _____
 Document description _____ File or accession #'s _____

RECORDER INFORMATION

Recorder Name Christopher Berger Affiliation Archaeological Consultants Inc

Recorder Contact Information 8110 Blaikie Court, Suite A, Sarasota, FL 34240/941-379-6206/ACIFlorida@comcast.net
 (address / phone / fax / e-mail)

Required Attachments

- ① USGS 7.5' MAP WITH STRUCTURE LOCATION PINPOINTED IN RED
- ② LARGE SCALE STREET, PLAT OR PARCEL MAP (available from most property appraiser web sites)
- ③ PHOTO OF MAIN FACADE, ARCHIVAL B&W PRINT OR DIGITAL IMAGE FILE

If submitting an image file, it must be included on disk or CD AND in hard copy format (plain paper is acceptable).
 Digital image must be at least 1600 x 1200 pixels, 24-bit color, jpeg or tiff.

CONTINUATION SHEET**Narrative Description:**

NLAX 177, NLAX 178, and NLAX 179 are three gondola railroad cars within the NASA Kennedy Space Center Railroad System.

NLAX 177 and NLAX 178 are 60' steel cars that rest on four axles with a cushioned underframe and weigh 100 tons. The railcars are 10'-8" wide and have side sheets 3'-8" tall with wood floors (KSC-TO, Folder No. 6670-5-177). NLAX 178 has a roof, removable in three sections.

NLAX 177 and NLAX 178 were built by Ortner in 1966 and owned by the Rock Island Railroad with the numbers RI 3892 and RI 3896 (KSC-TO 1987). NASA bought NLAX 177 for \$3,000 in late 1984 from the Chicago Pacific Corp., formerly the Rock Island Railroad. NLAX 178 was purchased for an unknown amount from the Chicago Pacific Corp. early in 1985.

NLAX 179 is a steel car that rests on four axles. It is 45' long, 9'-10" wide, has 3' tall side sheets, and weighs 70 tons. NLAX 179 was assembled in 1995 by the NASA Railroad crew by using parts from various railroad cars, including NLAX 006 (KSC-TO, Folder No. 6670-5-179). It was used maintain the railroad track and serve as a spacer car (Crews 2012).

Bibliographic References:

Crews, Jesse (KSC Railroad technician)

2012 Interview by Christopher Berger, January 25. Notes on file at Archaeological Consultants, Inc.

NASA KSC, Transportation Office (KSC-TO)

1987 NASA Railroad Equipment Listing. August 10.

Var. Folder No. 6670-5-177; NLAX 177 Gondola; 100 Ton; Formerly RI 3892

Var. Folder No. 6670-5-179; Gondola NLAX 179; 40 Foot, 70-Ton All Steel



PHOTOGRAPHS



NLAX 179, 60-Foot Gondola



NLAX 178, 60-Foot Gondola

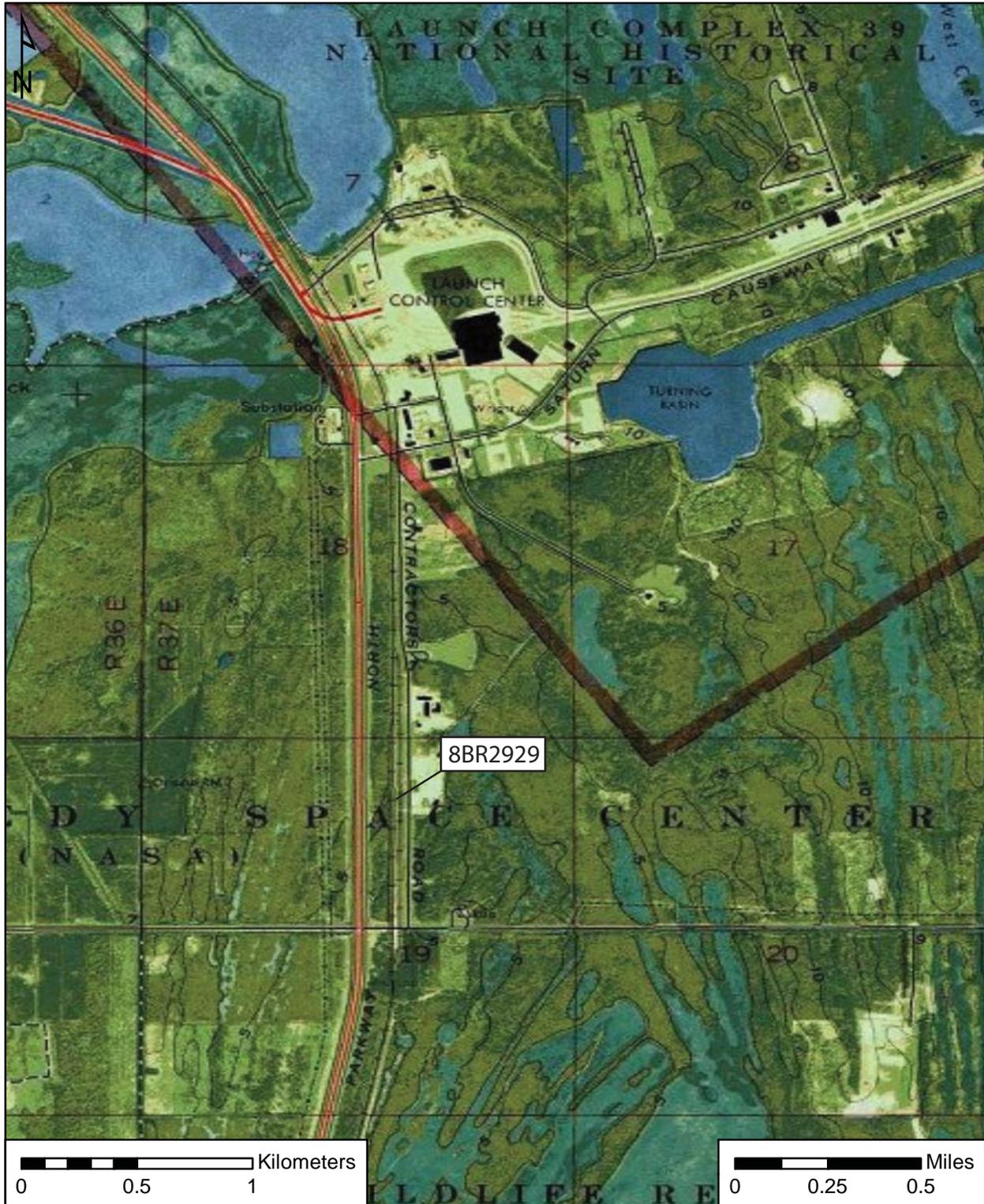


USGS

Orsino

Township 22 South, Range 37 East, Section 19

National Geographic Society (2011) USA Topo Maps.



Original
 Update



HISTORICAL STRUCTURE FORM

FLORIDA MASTER SITE FILE

Version 4.0 1/07

Site #8 **BR02930**
Field Date 1-24-2012
Form Date 2-21-2012
Recorder # 25

Shaded Fields represent the minimum acceptable level of documentation.
Consult the *Guide to Historical Structure Forms* for detailed instructions.

Site Name(s) (address if none) NLAX 194 Multiple Listing (DHR only) _____
Survey Project Name Historic Survey of NASA Railroad System Survey # (DHR only) _____
National Register Category (please check one) building structure district site object
Ownership: private-profit private-nonprofit private-individual private-nonspecific city county state federal Native American foreign unknown

LOCATION & MAPPING

Address: Contractor Street Number _____ Direction _____ Street Name _____ Street Type _____ Suffix Direction _____
Cross Streets (nearest / between) Schwartz Road and Saturn Causeway
USGS 7.5 Map Name ORSINO USGS Date 1976 Plat or Other Map _____
City / Town (within 3 miles) Titusville In City Limits? yes no unknown County Brevard
Township 22S Range 37E Section 19 1/4 section: NW SW SE NE Irregular-name: _____
Tax Parcel # Not applicable Landgrant _____
Subdivision Name _____ Block _____ Lot _____
UTM Coordinates: Zone 16 17 Easting 533794 Northing 3160101
Other Coordinates: X: _____ Y: _____ Coordinate System & Datum _____
Name of Public Tract (e.g., park) _____

HISTORY

Construction Year: 1982 approximately year listed or earlier year listed or later
Original Use Other From (year): _____ To (year): _____
Current Use Other From (year): _____ To (year): _____
Other Use Railcar From (year): _____ To (year): _____
Moves: yes no unknown Date: _____ Original address _____
Alterations: yes no unknown Date: _____ Nature See continuation sheet
Additions: yes no unknown Date: _____ Nature _____
Architect (last name first): _____ Builder (last name first): Unknown
Ownership History (especially original owner, dates, profession, etc.) NASA, unknown-present

Is the Resource Affected by a Local Preservation Ordinance? yes no unknown Describe _____

DESCRIPTION

Style Not applicable Exterior Plan Not applicable Number of Stories NA
Exterior Fabric(s) 1. Steel 2. _____ 3. _____
Roof Type(s) 1. _____ 2. _____ 3. _____
Roof Material(s) 1. _____ 2. _____ 3. _____
Roof secondary strucs. (dormers etc.) 1. _____ 2. _____
Windows (types, materials, etc.) _____

Distinguishing Architectural Features (exterior or interior ornaments) _____

Ancillary Features / Outbuildings (record outbuildings, major landscape features; use continuation sheet if needed.) _____

DHR USE ONLY		OFFICIAL EVALUATION		DHR USE ONLY	
NR List Date _____	SHPO – Appears to meet criteria for NR listing: <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> insufficient info	Date _____	Init. _____		
<input type="checkbox"/> Owner Objection	KEEPER – Determined eligible: <input type="checkbox"/> yes <input type="checkbox"/> no	Date _____			
	NR Criteria for Evaluation: <input type="checkbox"/> a <input type="checkbox"/> b <input type="checkbox"/> c <input type="checkbox"/> d (see <i>National Register Bulletin 15</i> , p. 2)				

DESCRIPTION (continued)

Chimney: No. ____ Chimney Material(s): 1. _____ 2. _____
 Structural System(s): 1. _____ 2. _____ 3. _____
 Foundation Type(s): 1. _____ 2. _____
 Foundation Material(s): 1. _____ 2. _____
 Main Entrance (stylistic details) _____

Porch Descriptions (types, locations, roof types, etc.) _____

Condition (overall resource condition): excellent good fair deteriorated ruinous

Narrative Description of Resource See continuation sheet

Archaeological Remains _____ Check if Archaeological Form Completed

RESEARCH METHODS (check all that apply)

FMSF record search (sites/surveys) library research building permits Sanborn maps
 FL State Archives/photo collection city directory occupant/owner interview plat maps
 property appraiser / tax records newspaper files neighbor interview Public Lands Survey (DEP)
 cultural resource survey (CRAS) historic photos interior inspection HABS/HAER record search
 other methods (describe) _____

Bibliographic References (give FMSF manuscript # if relevant, use continuation sheet if needed) See continuation sheet

OPINION OF RESOURCE SIGNIFICANCE

Appears to meet the criteria for National Register listing individually? yes no insufficient information

Appears to meet the criteria for National Register listing as part of a district? yes no insufficient information

Explanation of Evaluation (required, whether significant or not; use separate sheet if needed) Although NASA owns this railcar, it was not a significant contributor to any U.S. manned space program; therefore, it is not considered individually eligible for the NRHP, nor is it considered contributing to the NASA KSC Railroad System HD.

Area(s) of Historical Significance (see *National Register Bulletin 15*, p. 8 for categories: e.g. "architecture", "ethnic heritage", "community planning & development", etc.)

1. Other 3. _____ 5. _____
 2. Transportation 4. _____ 6. _____

DOCUMENTATION

Accessible Documentation Not Filed with the Site File - including field notes, analysis notes, photos, plans and other important documents

1) Document type All materials at one location Maintaining organization Archaeological Consultants Inc
 Document description _____ File or accession #'s P9026Q
 2) Document type _____ Maintaining organization _____
 Document description _____ File or accession #'s _____

RECORDER INFORMATION

Recorder Name Christopher Berger Affiliation Archaeological Consultants Inc

Recorder Contact Information 8110 Blaikie Court, Suite A, Sarasota, FL 34240/941-379-6206/ACIFlorida@comcast.net
 (address / phone / fax / e-mail)

Required Attachments

- ① USGS 7.5' MAP WITH STRUCTURE LOCATION PINPOINTED IN RED
- ② LARGE SCALE STREET, PLAT OR PARCEL MAP (available from most property appraiser web sites)
- ③ PHOTO OF MAIN FACADE, ARCHIVAL B&W PRINT OR DIGITAL IMAGE FILE

If submitting an image file, it must be included on disk or CD AND in hard copy format (plain paper is acceptable).
 Digital image must be at least 1600 x 1200 pixels, 24-bit color, jpeg or tiff.

CONTINUATION SHEET**Narrative Description:**

NLAX 194 is the only 70-ton water tank railroad car within the NASA Kennedy Space Center Railroad System (KSC-TO 2011). The steel car is 44' long and sits on four axles with a cushioned underframe and railings at both ends. The tank holds approximately 15,000 gallons, and a manway on the top provides access to the tank. NASA bought the car to eradicate weeds along the railroad tracks, but the car never received the proper certification for the task (Stephens 2012). NLAX 194 was refurbished at an unknown date and is marked as a water car.

Bibliographic References:

NASA KSC, Transportation Office (KSC-TO)

2011 NASA Railroad Equipment Listing. July 21.

Stephens, Mike (KSC Railroad technician).

2012 Email interview by Christopher Berger, March 7. Notes on file at Archaeological Consultants Inc.



PHOTOGRAPHS



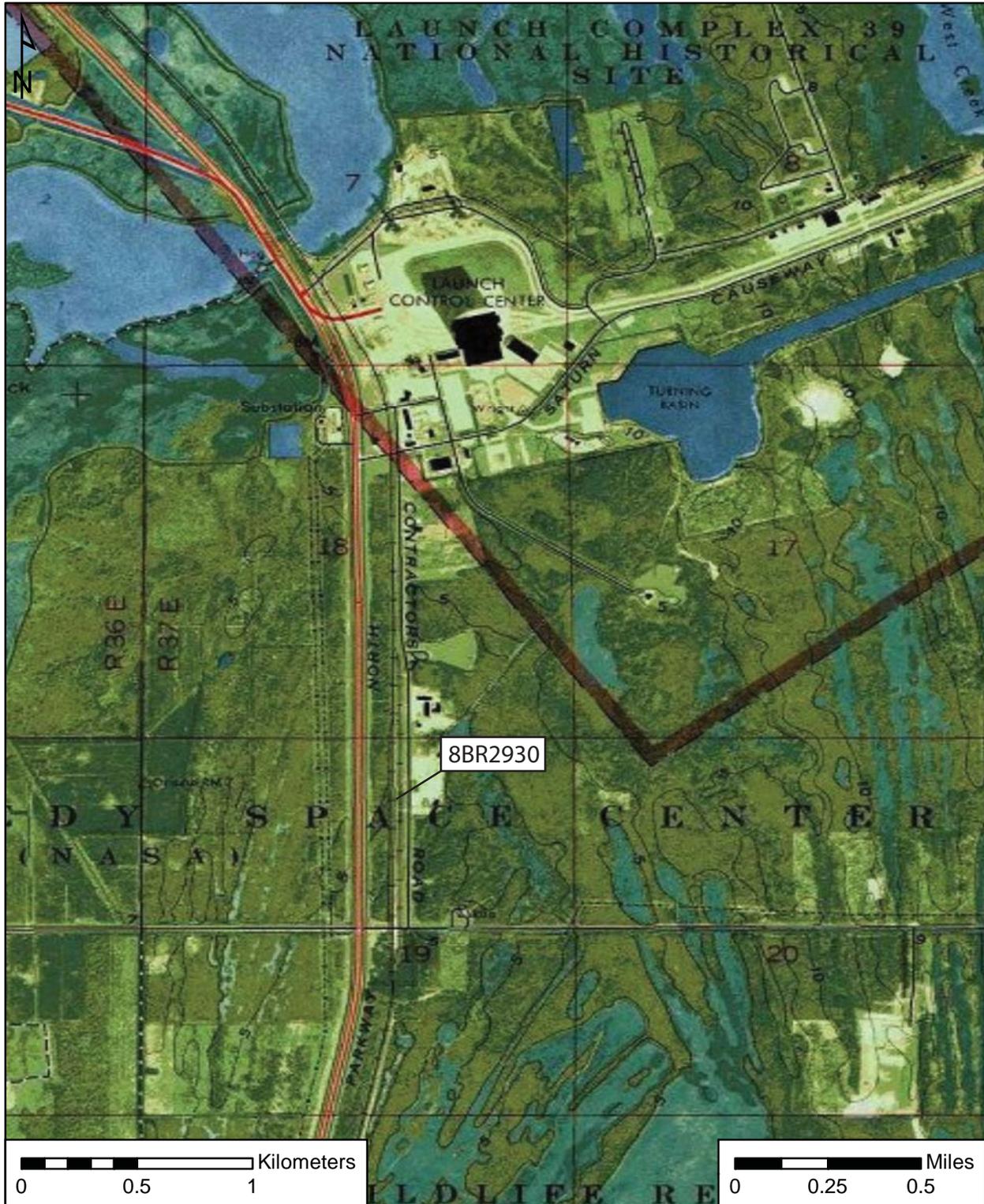
NLAX 194, 70-Ton Water Tank



USGS

Orsino

Township 22 South, Range 37 East, Section 19
National Geographic Society (2011) USA Topo Maps.





RESOURCE GROUP FORM
FLORIDA MASTER SITE FILE
Version 4.0 1/07

Site #8 BR02932
Field Date 1-23-2012
Form Date 2-27-2012
Recorder#

[X] Original
[] Update

NOTE: Use this form to document districts, landscapes, building complexes and linear resources as described in the box below. Cultural resources contributing to the Resource Group should also be documented individually at the Site File. Do not use this form for National Register multiple property submissions (MPSs).

Check ONE box that best describes the Resource Group:

- [X] Historic district (NR category "district"): buildings and NR structures only: NO archaeological sites
[] Archaeological district (NR category "district"): archaeological sites only: NO buildings or NR structures
[] Mixed district (NR category "district"): includes more than one type of cultural resource (example: archaeological sites and buildings)
[] Building complex (NR category usually "building(s)": multiple buildings in close spatial and functional association
[] Designed historic landscape (NR category usually "district" or "site"): can include multiple resources (see National Register Bulletin #18, page 2 for more detailed definition and examples: e.g. parks, golf courses, campuses, resorts, etc.)
[] Rural historic landscape (NR category usually "district" or "site"): can include multiple resources and resources not formally designed (see National Register Bulletin #30, Guidelines for Evaluating and Documenting Rural Historic Landscapes for more detailed definition and examples: e.g. farmsteads, fish camps, lumber camps, traditional ceremonial sites, etc.)
[] Linear resource (NR category usually "structure"): Linear resources are a special type of rural historic landscape and can include canals, railways, roads, etc.

Resource Group Name NASA KSC Railroad System Hist. District Multiple Listing [DHR only]
Project Name FMSF Survey #
National Register Category (please check one): []building(s) []structure [X]district []site []object
Linear Resource Type (if applicable): []canal []railway []road []other (describe):
Ownership: []private-profit []private-nonprofit []private-individual []private-nonspecific []city []county []state [X]federal []Native American []foreign []unknown

LOCATION & MAPPING

Street Number Direction Street Name Street Type Suffix Direction
Address: Kennedy Space Center
City/Town (within 3 miles) Titusville In Current City Limits? []yes [X]no []unknown
County or Counties (do not abbreviate) Brevard
Name of Public Tract (e.g., park)
1) Township Range Section 1/4 section: []NW []SW []SE []NE Irregular-name:
2) Township Range Section 1/4 section: []NW []SW []SE []NE
3) Township Range Section 1/4 section: []NW []SW []SE []NE
4) Township Range Section 1/4 section: []NW []SW []SE []NE
USGS 7.5' Map(s) 1) Name USGS Date
2) Name USGS Date
Plat, Aerial, or Other Map (map's name, originating office with location)
Landgrant
Verbal Description of Boundaries (description does not replace required map) see continuation sheet.

Table with 3 columns: DHR USE ONLY, OFFICIAL EVALUATION, DHR USE ONLY. Contains fields for NR List Date, Owner Objection, SHPO/KEEPER criteria, and dates.

HISTORY & DESCRIPTION

Construction Year: 0000 [X]approximately []year listed or earlier []year listed or later

Architect/Designer(last name first): Builder(last name first): see continuation sheet

Total number of individual resources included in this Resource Group: # of contributing 7 # of non-contributing

Time period(s) of significance (choose a period from the list or type in date range(s), e.g. 1895-1925)

- 1. ca. 1978-2010 3. 2. 4.

Narrative Description (National Register Bulletin 16A pp. 33-34; fit a summary into 3 lines or attach supplementary sheets if needed) see continuation sheet

RESEARCH METHODS (check all that apply)

- [X]FMSF record search (sites/surveys) [X]library research []building permits []Sanborn maps
[X]FL State Archives/photo collection []city directory [X]occupant/owner interview [X]plat maps
[]property appraiser / tax records [X]newspaper files []neighbor interview [X]Public Lands Survey (DEP)
[X]cultural resource survey [X]historic photos []interior inspection []HABS/HAER record search
[]other methods (specify)

Bibliographic References (give FMSF Manuscript # if relevant) see continuation sheet

OPINION OF RESOURCE SIGNIFICANCE

Potentially eligible individually for National Register of Historic Places? []yes [X]no []insufficient information

Potentially eligible as contributor to a National Register district? [X]yes []no []insufficient information

Explanation of Evaluation (required, see National Register Bulletin 16A p. 48-49. Attach longer statement, if needed, on separate sheet.) see continuation sheet

Area(s) of Historical Significance (see National Register Bulletin 15, p. 8 for categories: e.g. "architecture", "ethnic heritage", "community planning & development", etc.)

- 1. Other 3. 5. 2. Transportation 4. 6.

DOCUMENTATION

Accessible Documentation Not Filed with the Site File - including field notes, analysis notes, photos, plans and other important documents

1) Document type All materials at one location Maintaining organization Archaeological Consultants Inc
Document description File or accession #'s P9026Q

2) Document type Maintaining organization
Document description File or accession #'s

RECORDER INFORMATION

Recorder Name Trish Slovinac Affiliation Archaeological Consultants Inc

Recorder Contact Information 8110 Blaikie Court, St A, Sarasota, FL 34240/941-379-6206/ACIFloridaAcomcast.net
(address / phone / fax / e-mail)

Required Attachments
1 PHOTOCOPY OF USGS 7.5' MAP WITH DISTRICT BOUNDARY CLEARLY MARKED
2 LARGE SCALE STREET, PLAT OR PARCEL MAP WITH RESOURCES MAPPED & LABELED
3 TABULATION OF ALL INCLUDED RESOURCES (name, FMSF #, contributing? Y/N, resource category, street address or township-range-section if no address)
4 PHOTOS OF GENERAL STREETScape OR VIEWS (Optional: aerial photos, views of typical resources)
Photos may be archival B&W prints OR digital image files. If submitting digital image files, they must be included on disk or CD AND in hard copy format (plain paper is acceptable). Digital images must be at least 1600 x 1200 pixels, 24-bit color, jpeg or tiff.

CONTINUATION SHEET

LOCATION AND MAPPING*Township/Range/Section*

21S/35E/21, 23, 24

21S/36E/19, 20, 21, 22, 23, 26, 27, 35, 36

22S/36E/1, 12

22S/37E/7, 18, 19

USGS 7.5' Maps:

Mims, Fla. 1949, PR 1970

Orsino, Fla. 1976

Wilson, Fla. 1949, PR 1979

VERBAL DESCRIPTION OF BOUNDARIES

The west boundary of the NASA KSC Railroad System Historic District is the point where it meets the Florida East Coast Line in the Titusville area. The south boundary is south of the Locomotive Maintenance Facility, where the four spurs meet south of Schwartz Road. The east boundary is the point where the spur that passes through the Rotation, Processing, and Surge Facility rejoins the dual tracks that bypass the building to the south. The width of the Historic District is defined as the width of the railroad bed, which ranges from 29' wide (single track) to 125' wide (multiple tracks, e.g. Locomotive Maintenance Facility).

TABULATION OF RESOURCES*CONTRIBUTING*

FMSF	SITE NAME & ADDRESS	RESOURCE CATEGORY
8BR2931	NASA KSC Railroad Track (~ 19 miles) John F. Kennedy Space Center	Resource Group
8BR2906	Jay Jay Railroad Draw Bridge Facility H2-1198 John F. Kennedy Space Center	Bridge
8BR2908	NLAX 170 70-ton Aft Skirt Car Locomotive Maintenance Facility, John F. Kennedy Space Center	Structure
8BR3042	NLAX 171 70-ton Aft Skirt Car Locomotive Maintenance Facility, John F. Kennedy Space Center	Structure
8BR2923	Locomotive 1 Locomotive Maintenance Facility, John F. Kennedy Space Center	Structure

CONTINUATION SHEET

TABULATION OF RESOURCES, cont.*CONTRIBUTING*

8BR3043	Locomotive 2 Locomotive Maintenance Facility, John F. Kennedy Space Center	Structure
8BR3044	Locomotive 3 Locomotive Maintenance Facility, John F. Kennedy Space Center	Structure

NARRATIVE DESCRIPTION

The NASA KSC Railroad System Historic District is comprised of an approximately 19-mile segment of the west branch of the railroad track (8BR2931), the Jay Jay Railroad Draw Bridge (8BR2906), the three locomotives (Locomotive 1 [8BR2923], Locomotive 2 [8BR3043], and Locomotive 3 [8BR3044]), and the two 70-ton aft skirt cars (NLAX 170 [8BR2908] and NLAX 171 [8BR3042]). The portion of the railroad track that contributes to the district is that segment that extends from the Jay Jay Yard east to Wilson's Corner; the portion of the west branch from Wilson's Corner to just south of Schwartz Road; the small spur to Suspect Siding; and the small at the RPSF. The Jay Jay Bridge is embedded within the section between Jay Jay Yard and Wilson's Corner. This portion of the railroad track directly supported the delivery of SRM segments and other major Shuttle components (Heiney 2011).

EXPLANATION OF EVALUATION

The NASA KSC Railroad System Historic District is considered eligible for inclusion in the NRHP in the context of the U.S. Space Shuttle Program under Criterion A for its significant historical associations in the areas of Space Exploration and Transportation. Because it has achieved exceptional national significance in the last 50 years, Criteria Consideration G applies. The period of significance for the NASA KSC Railroad System Historic District extends from 1978, when the first flight SRM segments arrived at KSC, to 2010, when the final set of SRM segments arrived at the center. The railroad track, including the bridge, were used throughout the Space Shuttle Program to carry fueled SRM segments from Utah to KSC, and spent SRM segments from KSC to Utah (Heiney 2011; *Spaceport News* 2001). Because of the size of the SRM segments (12-foot wide), weight (150-tons each), and hazardous nature, shipment by rail was the only practical means of transport (Heiney 2011).

The three locomotives were crucial to the NASA Railroad's support of the SSP; everything that entered the KSC from 1984 to 2010 via the railroad was transported by one of these three locomotives. In addition, the railroad supported the delivery of SRB aft skirts, forward skirts, and frustums from California to KSC, via the NLAX 170 and NLAX 171 railcars. Each of these cars was capable of carrying one frustum, one forward skirt, and two aft skirts.

CONTINUATION SHEET

BIBLIOGRAPHY

ACI

2012 FMSF Forms for 8BR2906, 8BR2908, 8BR2922, 8BR2923, and 8BR2931. On file, Florida Master Site File, Florida Division of Historical Resources.

Heiney, Anna.

2011 NASA Railroad Played Vital Role in Shuttle Booster Haul. *Spaceport News*. 11 February:6.

Spaceport News

2001 Inside KSC Railroad. 8 June:4.



PHOTOGRAPHS



Jay Jay Yard, facing west



Jay Jay Bridge, facing west



PHOTOGRAPHS



Track between Jay Jay Yard and Wilson's Corner, facing east



Wilson Yard, facing west



PHOTOGRAPHS



Track north of the Vehicle Assembly Building, facing south



Track near the Rotation, Processing and Surge Facility, facing west



PHOTOGRAPHS



Track near the Locomotive Maintenance Facility, facing south



Jay Jay Bridge, facing southeast



PHOTOGRAPHS



Jay Jay Bridge bascule, facing south



Locomotive No. 3



PHOTOGRAPHS



Locomotive No. 1



NLAX 170, 70-Ton Aft Skirt, sides



PHOTOGRAPHS



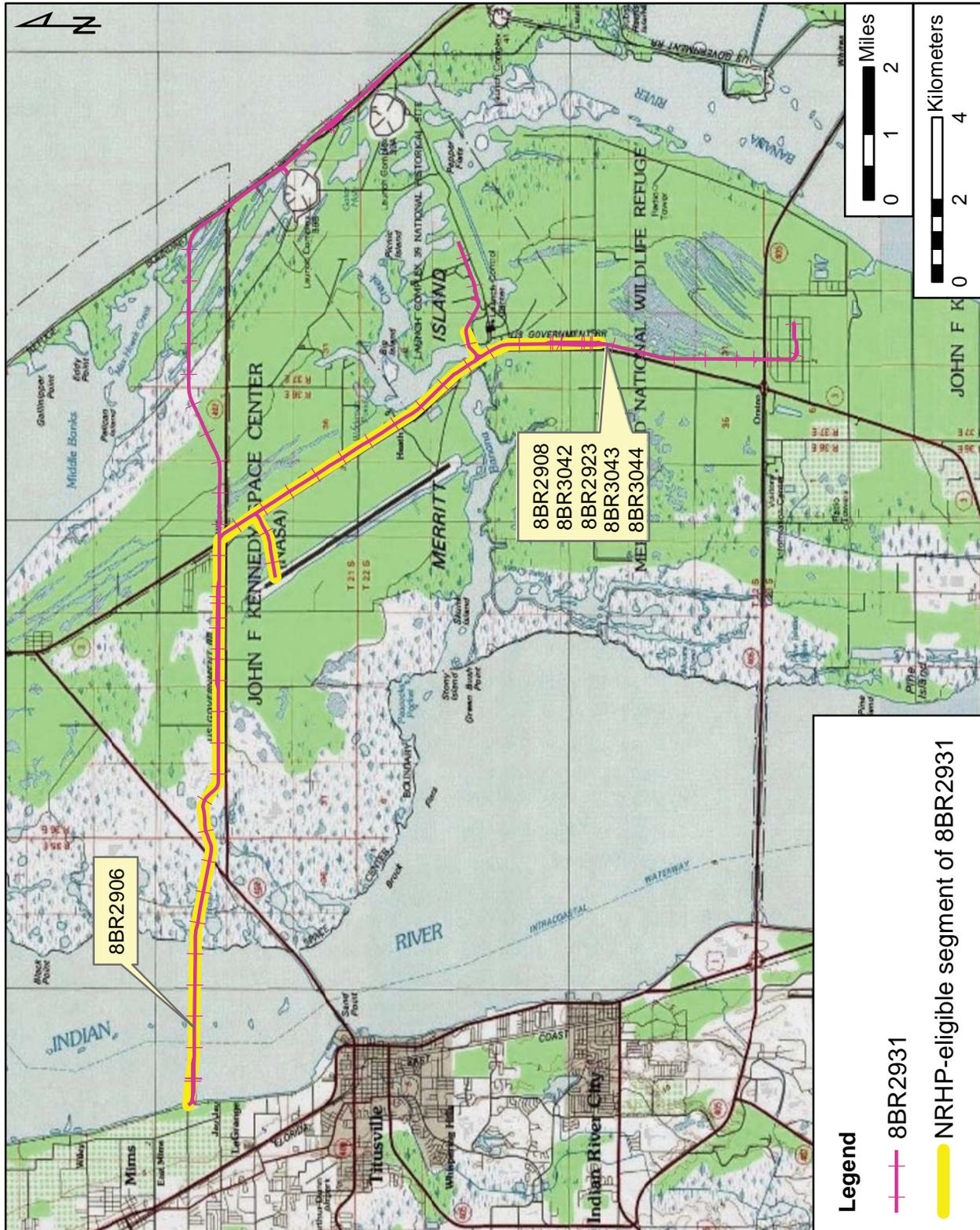
NLAX 170, 70-Ton Aft Skirt, top



USGS

21S/35E/21, 23, 24
 21S/36E/19, 20, 21, 22, 23, 24, 26, 27, 35, 36
 21S/37E/19, 20, 21, 27, 28, 34
 22S/36E/1, 12
 22S/37E/2, 3, 7, 8, 18, 19, 30, 31
 23S/37E/5

False Cape, Fla. 1976, PI 1984
 Mims, Fla. 1949, PR 1970
 Orsino, Fla. 1976
 Wilson, Fla. 1949, PR 1979



National Geographic Society (2011) USA Topo Maps.

Original
 Update



HISTORICAL STRUCTURE FORM

FLORIDA MASTER SITE FILE

Version 4.0 1/07

Site #8 **BR03035**
Field Date 1-23-2012
Form Date 9-13-2012
Recorder # _____

Shaded Fields represent the minimum acceptable level of documentation.
Consult the *Guide to Historical Structure Forms* for detailed instructions.

Site Name(s) (address if none) Locomotive Maintenance Facility Multiple Listing (DHR only) _____
Survey Project Name Historic Survey of NASA Railroad System Survey # (DHR only) _____
National Register Category (please check one) building structure district site object
Ownership: private-profit private-nonprofit private-individual private-nonspecific city county state federal Native American foreign unknown

LOCATION & MAPPING

Street Number K6-1844 Direction _____ Street Name Contractors Road Street Type _____ Suffix Direction _____
Address: _____
Cross Streets (nearest / between) btwn Saturn Cswy and Schwartz Rd on west
USGS 7.5 Map Name ORSINO USGS Date 1976 Plat or Other Map _____
City / Town (within 3 miles) Titusville In City Limits? yes no unknown County Brevard
Township 22S Range 37E Section 19 ¼ section: NW SW SE NE Irregular-name: _____
Tax Parcel # N/A Landgrant _____
Subdivision Name _____ Block _____ Lot _____
UTM Coordinates: Zone 16 17 Easting 533794 Northing 3160101
Other Coordinates: X: _____ Y: _____ Coordinate System & Datum _____
Name of Public Tract (e.g., park) _____

HISTORY

Construction Year: 1978 approximately year listed or earlier year listed or later
Original Use Other From (year): _____ To (year): _____
Current Use Other From (year): _____ To (year): _____
Other Use maintenance facility From (year): _____ To (year): _____
Moves: yes no unknown Date: _____ Original address _____
Alterations: yes no unknown Date: _____ Nature _____
Additions: yes no unknown Date: _____ Nature _____
Architect (last name first): unknown Builder (last name first): unknown
Ownership History (especially original owner, dates, profession, etc.) National Aeronautics and Space Administration

Is the Resource Affected by a Local Preservation Ordinance? yes no unknown Describe _____

DESCRIPTION

Style Industrial Vernacular Exterior Plan Rectangular Number of Stories 1
Exterior Fabric(s) 1. Steel 2. _____ 3. _____
Roof Type(s) 1. Gable 2. _____ 3. _____
Roof Material(s) 1. Sheet metal: corrugated 2. _____ 3. _____
Roof secondary strucs. (dormers etc.) 1. _____ 2. _____
Windows (types, materials, etc.) _____

Distinguishing Architectural Features (exterior or interior ornaments) _____

Ancillary Features / Outbuildings (record outbuildings, major landscape features; use continuation sheet if needed.) see continuation sheet

DHR USE ONLY		OFFICIAL EVALUATION		DHR USE ONLY	
NR List Date	SHPO – Appears to meet criteria for NR listing: <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> insufficient info	Date	_____	Init.	_____
<input type="checkbox"/> Owner Objection	KEEPER – Determined eligible: <input type="checkbox"/> yes <input type="checkbox"/> no	Date	_____		
	NR Criteria for Evaluation: <input type="checkbox"/> a <input type="checkbox"/> b <input type="checkbox"/> c <input type="checkbox"/> d (see <i>National Register Bulletin 15</i> , p. 2)				

DESCRIPTION (continued)

Chimney: No. ___ Chimney Material(s): 1. ___ 2. ___
Structural System(s): 1. Skeleton-steel 2. ___ 3. ___
Foundation Type(s): 1. Slab 2. ___
Foundation Material(s): 1. Poured Concrete Footing 2. ___
Main Entrance (stylistic details) ___

Porch Descriptions (types, locations, roof types, etc.) ___

Condition (overall resource condition): [] excellent [x] good [] fair [] deteriorated [] ruinous

Narrative Description of Resource see attached

Archaeological Remains ___ [] Check if Archaeological Form Completed

RESEARCH METHODS (check all that apply)

- [x] FMSF record search (sites/surveys) [x] library research [] building permits [] Sanborn maps
[] FL State Archives/photo collection [] city directory [x] occupant/owner interview [] plat maps
[] property appraiser / tax records [x] newspaper files [] neighbor interview [] Public Lands Survey (DEP)
[x] cultural resource survey (CRAS) [x] historic photos [x] interior inspection [] HABS/HAER record search
[] other methods (describe) ___

Bibliographic References (give FMSF manuscript # if relevant, use continuation sheet if needed) see attached

OPINION OF RESOURCE SIGNIFICANCE

Appears to meet the criteria for National Register listing individually? [] yes [x] no [] insufficient information

Appears to meet the criteria for National Register listing as part of a district? [] yes [x] no [] insufficient information

Explanation of Evaluation (required, whether significant or not; use separate sheet if needed) see attached

Area(s) of Historical Significance (see National Register Bulletin 15, p. 8 for categories: e.g. "architecture", "ethnic heritage", "community planning & development", etc.)

- 1. Transportation 3. ___ 5. ___
2. ___ 4. ___ 6. ___

DOCUMENTATION

Accessible Documentation Not Filed with the Site File - including field notes, analysis notes, photos, plans and other important documents

- 1) Document type All materials at one location Maintaining organization Archaeological Consultants Inc
Document description ___ File or accession #'s P9026Q
2) Document type ___ Maintaining organization ___
Document description ___ File or accession #'s ___

RECORDER INFORMATION

Recorder Name Slovinac, Trish Affiliation Archaeological Consultants Inc

Recorder Contact Information 8110 Blaikie Court, St A, Sarasota, FL 34240/941-379-6206/ACIFloridaAcomcast.net
(address / phone / fax / e-mail)

Required Attachments
1 USGS 7.5' MAP WITH STRUCTURE LOCATION PINPOINTED IN RED
2 LARGE SCALE STREET, PLAT OR PARCEL MAP (available from most property appraiser web sites)
3 PHOTO OF MAIN FACADE, ARCHIVAL B&W PRINT OR DIGITAL IMAGE FILE
If submitting an image file, it must be included on disk or CD AND in hard copy format (plain paper is acceptable).
Digital image must be at least 1600 x 1200 pixels, 24-bit color, jpeg or tiff.

CONTINUATION SHEET**Narrative Description:**

The Locomotive Maintenance Facility (LMF; 8BR3035) is an Industrial Vernacular style structure constructed ca. 1978. It features a poured concrete slab foundation, and five steel arches that support the slightly gabled, corrugated metal roof. The east and west sides have corrugated metal wall panels just below the roofline, and the south side contains a partial wall of corrugated metal panels. Within the foundation, there are two sets of railroad tracks and a pit, which allows technicians to work on the undersides of the locomotives and railcars.

Adjacent to the east side of the LMF is a concrete block office building constructed ca. 2010, and to the west is a concrete storage building, also constructed in 2010. To the northwest of the LMF, there is a ca. 1993 hazardous material staging area, which takes the form of a metal pole barn partially faced with corrugated metal panels, and a ca. 1996 petroleum, oil, and lubricants storehouse made of metal panels. In addition, there is a ca. 1996 abrasive recovery building, constructed of a steel skeleton faced with corrugated metal panels.

Explanation of Evaluation:

Although considered part of the NASA KSC Railroad System to which it provided general support, the LMF is neither distinguished by significant historical associations to events or persons in the context of the U.S. Manned Space Program, nor by its architectural features. Additionally, because of the very recent construction dates of the five ancillary features, none has significantly contributed to manned space flight. Therefore, the LMF or the ancillary buildings are not considered eligible for the NRHP either individually or as contributing resources to the NASA KSC Railroad System Historic District (8BR2932).

Bibliographic References

Crews, Jesse (KSC Railroad Technician)

2012 Personal communication with Trish Slovinac and Christopher Berger. January 24. Notes on file at Archaeological Consultants Inc.

Stephens, Mike (KSC Railroad Technician)

2012 Personal communication with Trish Slovinac and Christopher Berger. January 24. Notes on file at Archaeological Consultants Inc.



Historic Structure Form

PHOTOGRAPHS



Locomotive Maintenance Facility, facing north



Locomotive Maintenance Facility, facing southwest



Historic Structure Form

Site # 8BR3035

PHOTOGRAPHS



Pit in foundation of Locomotive Maintenance Facility, facing northwest



Historic Structure Form

Site # 8BR3035

PHOTOGRAPHS



Ca. 2010 office building (K6-1844D), facing northwest



Ca. 2010 storage building (K6-1844E), facing northeast



Ca. 1993 hazardous materials staging area (K6-1844A; left) and ca. 2006 petroleum, oil, and lubricants storehouse (K6-1844C; right), facing northwest



Ca. 1995 abrasive recovery building (K6-1844B), facing northwest



AERIAL MAP

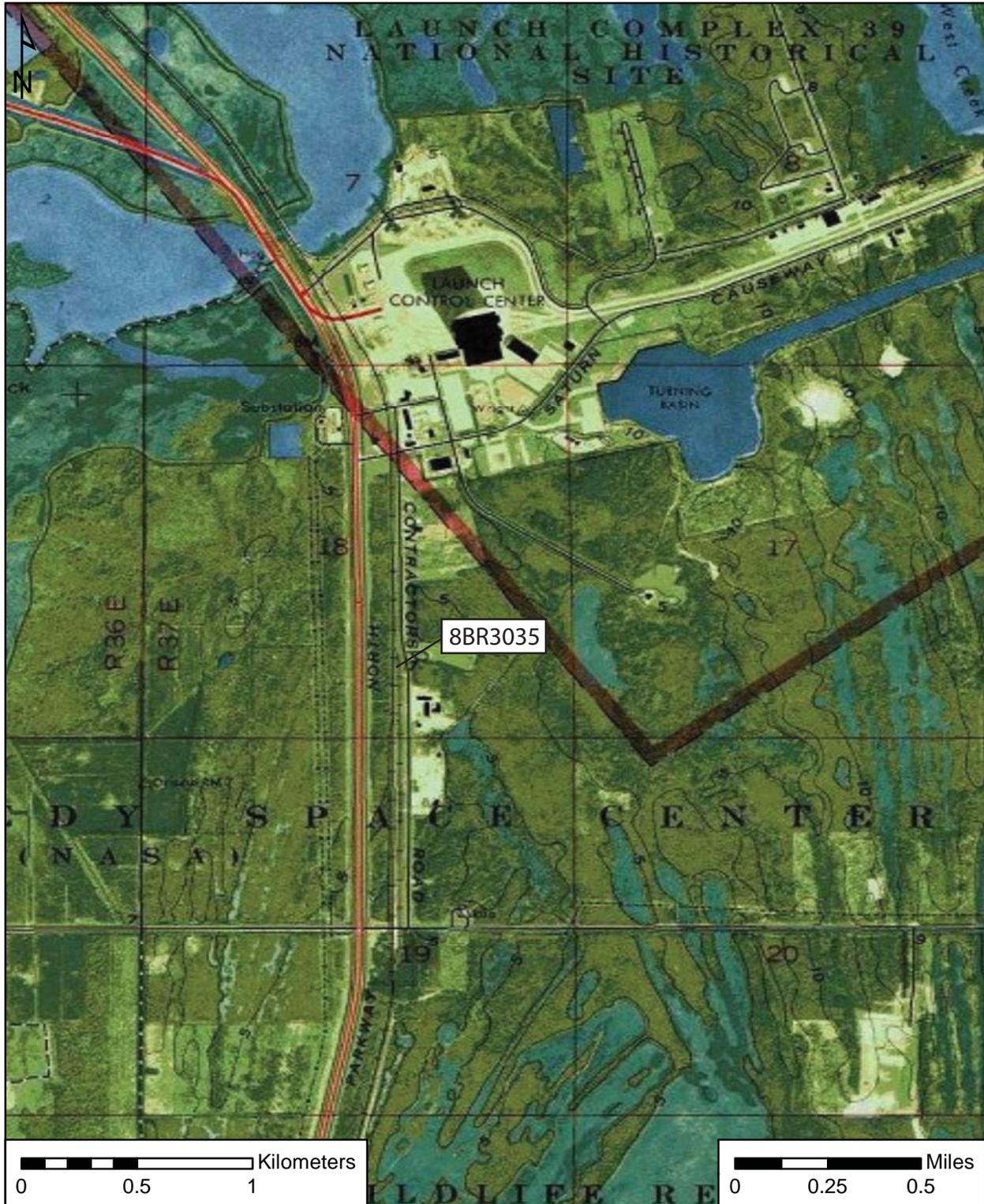




USGS

Orsino

Township 22 South, Range 37 East, Section 19
National Geographic Society (2011) USA Topo Maps.



APPENDIX B: NRHP Nomination Form

**United States Department of the Interior
National Park Service**

**NATIONAL REGISTER OF HISTORIC PLACES
REGISTRATION FORM**

This form is for use in nominating or requesting determinations for individual properties and districts. See instructions in How to Complete the National Register of Historic Places Registration Form (National Register Bulletin 16A). Complete each item by marking "x" in the appropriate box or by entering the information requested. If any item does not apply to the property being documented, enter "N/A" for "not applicable." For functions, architectural classification, materials, and areas of significance, enter only categories and subcategories from the instructions. Place additional entries and narrative items on continuation sheets (NPS Form 10-900a). Use a typewriter, word processor, or computer, to complete all items.

1. Name of Property

historic name NASA KSC Railroad System Historic District

other names/site number 8BR2932

2. Location

street & number Kennedy Space Center not for publication

city or town Titusville vicinity

state FLORIDA code FL county Brevard code 009 zip code 32899

3. State/Federal Agency Certification

As the designated authority under the National Historic Preservation Act, as amended, I hereby certify that this nomination request for determination of eligibility meets the documentation standards for registering properties in the National Register of Historic Places and meets the procedural and professional requirements set forth in 36 CFR Part 60. In my opinion, the property meets does not meet the National Register criteria. I recommend that this property be considered significant nationally statewide locally. (See continuation sheet for additional comments.)

Signature of certifying official/Title Date

Florida State Historic Preservation Officer, Division of Historical Resources
State or Federal agency and bureau

In my opinion, the property meets does not meet the National Register criteria. (See continuation sheet for additional comments.)

Signature of certifying official/Title Date

State or Federal agency and bureau

4. National Park Service Certification

I hereby certify that the property is:	Signature of the Keeper	Date of Action
<input type="checkbox"/> entered in the National Register <input type="checkbox"/> See continuation sheet	_____	_____
<input type="checkbox"/> determined eligible for the National Register <input type="checkbox"/> See continuation sheet.	_____	_____
<input type="checkbox"/> determined not eligible for the National Register <input type="checkbox"/> See continuation sheet.	_____	_____
<input type="checkbox"/> removed from the National Register.	_____	_____
<input type="checkbox"/> other, (explain) _____	_____	_____
_____	_____	_____
_____	_____	_____

8. Statement of Significance

Applicable National Register Criteria

(Mark "x" in one or more boxes for the criteria qualifying the property for National Register listing.)

- A Property is associated with events that have made a significant contribution to the broad patterns of our history.
B Property is associated with the lives of persons significant in our past.
C Property embodies the distinctive characteristics of a type, period, or method of construction or represents the work of a master, or possesses high artistic values, or represents a significant and distinguishable entity whose components lack individual distinction.
D Property has yielded, or is likely to yield information important in prehistory or history.

Criteria Considerations

(Mark "x" in all the boxes that apply.)

Property is:

- A owned by a religious institution or used for religious purposes.
B removed from its original location.
C a birthplace or grave.
D a cemetery.
E a reconstructed building, object, or structure.
F a commemorative property.
G less than 50 years of age or achieved significance within the past 50 years

Areas of Significance

Narrative Statement of Significance

(Explain the significance of the property on one or more continuation sheets.)

9. Major Bibliographical References

Bibliography

Cite the books, articles, and other sources used in preparing this form on one or more continuation sheets.)

Previous documentation on file (NPS):

- preliminary determination of individual listing (36 CFR 36) has been requested
Other State Agency
previously listed in the National Register
previously determined eligible by the National Register
designated a National Historic Landmark
recorded by Historic American Buildings Survey
recorded by Historic American Engineering Record

(Enter categories from instructions)

OTHER: Space Exploration
Transportation

Period of Significance

1978-2010

Significant Dates

1963, 1978-2010

Significant Person

Cultural Affiliation

N/A

Architect/Builder

Florida East Coast Railway; U.S. Army Corps of Engineers

Primary location of additional data:

- State Historic Preservation Office
Federal agency
Local government
University
Other

Name of Repository

#

10. Geographical Data

Acreeage of Property Approx. 172 acres

UTM References

(Place additional references on a continuation sheet.)

1	Zone	Easting	Northing
2	Zone	Easting	Northing

3	Zone	Easting	Northing
4	Zone	Easting	Northing

See continuation sheet

Verbal Boundary Description

(Describe the boundaries of the property on a continuation sheet.)

Boundary Justification

(Explain why the boundaries were selected on a continuation sheet.)

11. Form Prepared By

name/title Trish Slovinac, Architectural Historian

organization Archaeological Consultants, Inc. date June 2012

street & number 8110 Blaikie Court, Suite A telephone (941) 379-6206

city or town Sarasota state Florida zip code 34240

Additional Documentation

Submit the following items with the completed form:

Continuation Sheets

Maps

A USGS map (7.5 or 15 minute series) indicating the property's location.

A Sketch map for historic districts and properties having large acreage or numerous resources.

Photographs

Representative black and white photographs of the property.

Additional items

(check with the SHPO or FPO for any additional items)

Property Owner

(Complete this item at the request of SHPO or FPO.)

name National Aeronautics and Space Administration, Kennedy Space Center

street & number _____ telephone _____

city or town _____ state _____ zip code _____

Paperwork Reduction Act Statement: This information is being collected for applications to the National Register of Historic Places to nominate properties for listing or determine eligibility for listing, to list properties, and amend listings. Response to this request is required to obtain a benefit in accordance with the National Historic Preservation Act, as amended (16 U.S.C. 470 et seq.).

Estimated Burden Statement: Public reporting burden for this form is estimated to average 18.1 hours per response including time for reviewing instructions, gathering and maintaining data, and completing and reviewing the form. Direct comments regarding this burden estimate or any aspect of this form to the Chief, Administrative Services Division, National Park Service, P.O. Box 37127, Washington, DC 20013-7127; and the Office of Management and Budget, Paperwork Reductions Projects (1024-0018), Washington, DC 20503.

**United States Department of the Interior
National Park Service**

**NATIONAL REGISTER OF HISTORIC PLACES
CONTINUATION SHEET**

Section number 7 Page 1 NASA KSC Railroad System Historic District
Brevard County, Florida

SUMMARY

The NASA KSC Railroad System Historic District is comprised of an approximately 19-mile segment of the west branch of the railroad track, the Jay Jay Railroad Draw Bridge, the three locomotives, and the two 70-ton aft skirt cars (NLAX 170 and 171). The portion of the railroad track that contributes to the district is that segment that extends from the Jay Jay Yard east to Wilson's Corner; the portion of the west branch from Wilson's Corner to just south of Schwartz Road; the small spur to Suspect Siding; and the small at the RPSF. The Jay Jay Bridge is embedded within the section between Jay Jay Yard and Wilson's Corner. This portion of the railroad track directly supported the delivery of SRM segments and other major Shuttle components (Heiney 2011).

SETTING

The John F. Kennedy Space Center is NASA's primary Center for launch and landing operations and related programs in support of manned space missions. It is located on the east coast of Florida, about 150 miles (mi) south of Jacksonville, and to the north and west of Cape Canaveral, in Brevard and Volusia Counties. The Center encompasses almost 140,000 acres (ac) or nearly 218 mi². The Atlantic Ocean and Cape Canaveral Air Force Station (CCAFS) are located to the east, and the Indian River is to the west. Today, NASA KSC maintains operational control over 3,800 acres. The major facilities are located within the Industrial Area, the Launch Complex (LC) 39 Area, the VAB Area, and the Shuttle Landing Facility (SLF) Area. All operational areas are located in Brevard County.

NARRATIVE DESCRIPTION

The railroad track at KSC is categorized as a standard gauge industrial short line, with an approximate total length of 38 miles. Originally, the line was constructed of 100- or 112-pound jointed rail with wood crossties and limestone ballast. Circa 1983, the NASA installed 132-pound continuous-welded rail and a combination of concrete and wood crossties, "because of the hazardous commodities hauled over the railroad, particularly the solid rocket boosters for the space shuttle" (NASA 2007). The rebuilt line maintained the footprint/path of the original track; the limestone ballast was replaced with granite in the mid-1980s (NASA KSC Archives Department 1983).

The Jay Jay Railroad Draw Bridge (Jay Jay Bridge; H2-1198) carries the NASA Railroad over the Indian River. The bridge is 2,058' long and made up of 75 spans supported by 72 bents, two end bents, and two piers. A 158' x 20' single leaf, through-girder bascule steel span with floorbeams and stringers crosses a 90' channel, and the other 74 spans are fixed steel deck steel girders with an open deck that measures 24'-8" x 14'.

Locomotives 1, 2, and 3 are three switching locomotives within the NASA Kennedy Space Center (KSC) Railroad System. Each is a model EMD SW1500, built by General Motors' Electro-Motive Division. The locomotives are 44'-8"-long and stand 11'-9"-tall at the engine hood and 15' at the top of the cab. They weigh 248,000 tons and sit on two, four-wheel trucks with a 40" wheel diameter. A walkway surrounds the engine and is accessible either from the cab or from the steps at the front. The cab also can be entered through a door at the back. The 1,500 horsepower, V-12 diesel engine is capable of reaching speeds up to 65 mph (Bachand n.d.).

**United States Department of the Interior
National Park Service**

**NATIONAL REGISTER OF HISTORIC PLACES
CONTINUATION SHEET**

Section number 7 Page 2 NASA KSC Railroad System Historic District
Brevard County, Florida

Locomotive 1 was built in February 1968 for the Toledo, Peoria, and Western Railway, and Locomotives 2 and 3 followed in 1970. They had the numbers TP&W 303, 305, and 306. In all, 808 EMD SW1500 locomotives were built by General Motors (KSC-TO, Folder No. Locomotive 1). NASA bought the three locomotives on July 24, 1984, for \$108,000 each to replace three Alco S2 locomotive switcher cars that had previously belonged to the Army (KSC-TO, Folder No. Locomotive 1; NASA 2007). Locomotives 1 and 2 were repainted black, red, and gray with white stripes. Locomotive 3 was once painted in this color scheme as well but is now black, blue, and white with red stripes as a result of a 15-month corrosion repair project completed in 2008 (*Spaceport News* 2008). In 2004, the NASA Railroad crew rebuilt the engine for Locomotive 1 (Diller 2004).

NLAX 170 and NLAX 171 are 70-ton aft skirt railroad cars within the NASA Kennedy Space Center (KSC) Railroad System. The steel flatcars are 66' long, weigh 70 tons, and feature a double well design. Each car rests on four axles, and two steel vertical bulkhead beams approximately 12' tall with supports are located at both ends (KSC-TO, Folder No. 6670-5-170). NLAX 170 and NLAX 171 were designed to hold one frustum, one forward skirt, and two aft skirts. Boxes that contained the ground support equipment used to load, transport, and off load SRB components were strapped to the cars' decks.

**United States Department of the Interior
National Park Service**

**NATIONAL REGISTER OF HISTORIC PLACES
CONTINUATION SHEET**

Section number 8 Page 1 NASA KSC Railroad System Historic District
Brevard County, Florida

SUMMARY

The NASA KSC Railroad System Historic District is considered eligible for inclusion on the NRHP in the context of the U.S. Space Shuttle Program (ca. 1969 - 2011) under Criterion A for its significant historical associations in the areas of Space Exploration and Transportation. Because it has achieved exceptional national significance in the last 50 years, Criteria Consideration G applies. The period of significance for the NASA KSC Railroad System Historic District extends from 1978, when the first flight SRM segments arrived at KSC, to 2010, when the final set of SRM segments arrived at the center.

HISTORICAL CONTEXT

With the goal set by President Kennedy to land a man on the Moon by the end of the 1960s, and the decision to use the powerful Saturn V launch vehicle, it was apparent that a new launch complex was required, and CCAFS, already with 22 launch complexes, did not have available land for new rocket facilities. Merritt Island, an undeveloped area west and north of the Cape, was investigated along with eight other sites in Florida, Georgia, Texas, the Bahamas, Hawaii, and New Mexico. The Merritt Island site won this competition and in 1961, the Merritt Island Launch Area (MILA) was born (Benson and Faherty 2001). Eventually, MILA incorporated the Launch Operations Center as part of its jurisdiction; the entirety was renamed the John F. Kennedy Space Center in November 1963 following the death of the president (Benson and Faherty 2001).

The U.S. Army Corps of Engineers (ACOE) acted as agent for purchasing land, and NASA began gaining title to the land in late 1962, taking over 83,903.9 acres by outright purchase. Included in this purchase were several small towns, such as Orsino, Wilson, Heath and Audubon, in addition to farms, citrus groves, and several fish camps. Negotiations with the State of Florida provided submerged lands, resulting in the acquisition of property identified on the original Deed of Dedication. Much of the state-provided land was located south of the Old Haulover Canal and north of the Barge Canal.

With the newly purchased land, NASA designed a “spaceport,” formulated around the requirements of the Apollo Program. The original master plan for the center depicted a railroad system, to be used as a means “to provide railroad car delivery of construction supplies,” and later for “delivery of operations and maintenance supplies and equipment in connection with [Apollo] launches” (*Spaceport News* 1963a).

Circa 1962, NASA and the ACOE reached an agreement with the Florida East Coast Railway (FEC) for the construction and operations of a railroad system within KSC. The FEC had its beginning on December 31, 1885, when Henry M. Flagler purchased the Jacksonville, St. Augustine & Halifax River Railway, a 38-mile line that ran from Jacksonville to St. Augustine. Over the next few years, Flagler expanded his holdings along Florida’s east coast through the acquisition of existing lines and the construction of new lines; by 1889, he had assembled enough railroad track for a mainline between South Jacksonville and Daytona (Bramson 1984; Johnston and Mattick 2001; Pettengill 1952). Following additional acquisitions and expansions, on September 13, 1895, the Flagler system was officially organized as the Florida East Coast Railway Company. Further purchases and the laying of new track brought Flagler’s system as far as Miami; the FEC extended its line to Key West by 1912 (Bramson 1984; Morgan 1975; Johnston and Mattick 2001). Another major extension, begun in 1911, was the Okeechobee Branch, which ran for roughly 123 miles from Maytown in Volusia

**United States Department of the Interior
National Park Service**

**NATIONAL REGISTER OF HISTORIC PLACES
CONTINUATION SHEET**

Section number 8 Page 2 NASA KSC Railroad System Historic District
Brevard County, Florida

County to Lake Harber, where it connected to the Atlantic Coast Line Railroad (Bramson 1984; Johnston and Mattick 2001).

During its early years, the bulk of the FEC's business was the transporting of passengers, citrus fruits, and vegetables. With the Florida Land Boom of 1924, the FEC's business exploded, and as a result, the railway company invested \$45 million to construct new branch lines, yards, and other facilities. However, as the boom began to collapse, so did the fortunes of the FEC, and in 1931, the FEC began a three-decade long struggle with bankruptcy (Bramson 1984; Morgan 1975). Among its problems, the railway company had an excess of both track and diesel locomotive maintenance shops, as well as trouble with its safety record, operating ratio, and the employee's union. Shortly after the time when NASA and the ACOE were negotiating with the FEC, the railway company's problems with the union came to a head. On January 23, 1963, FEC employees began a strike over management's refusal to honor an industry-wide pay raise. For almost nine years, court battles, negotiations, political pressures, regulatory rulings, and acts of sabotage clouded FEC's daily operations, until December 1971, when FEC finally reached an agreement with its workers (Bramson 1984; Morgan 1975).

Per their agreement with NASA, the FEC would construct an approximately 7.5 mile long railroad extension from their track at the Titusville/Cape Canaveral Junction on the west shore of the Indian River to Wilson's Corner, located near the intersection of State Road 3 and State Road 402. Included in the agreement was the construction of the Jay Jay Bridge, a single-leaf, bascule bridge, that would carry the railroad track across the Indian River. The FEC also was contracted to build a seven-track yard, the Jay Jay Yard, at the Cape Canaveral Junction in Titusville, and a second, seven-track yard, the Wilson Yard, just west of Wilson's Corner (NASA 2007). The railroad was constructed of 100- or 112-pound jointed steel rail with wood cross ties and limestone ballast; all materials except for the ballast were materials the FEC salvaged when it removed its mainline double track ca. 1961 (Hoffman 2012a).

The ACOE maintained responsibility for the construction of an approximately 28-mile rail system in what would become the approximate 3,800-acre restricted area of KSC. The system consisted of two tracks, which split just east of Wilson's Corner. One track, known as the east branch, extended eastward toward the Atlantic Ocean (Playalinda Beach), before turning southeast to pass by Launch Pads 39A and 39B and extending to the boundary between KSC and CCAFS. There it connected to 22 miles of track at the CCAFS Titan Launch Complex (*Spaceport News* 1984b). The second track, known as the west branch, traveled south from Wilson's Corner, past the VAB Area, and into the Industrial Area of KSC (*Spaceport News* 1963a). Like the FEC portion of the railroad, the sections within the restricted area were 100- or 112-pound jointed rail with wood cross ties and limestone ballast. The ACOE, however, paid for all new materials, although it was later discovered that the contractors used salvaged materials (Hoffman 2012a).

On June 20, 1963, the ACOE opened bids for the construction of the KSC railroad system. The lowest bid for roughly \$2.4 million was submitted by A. S. Wickstrom, Inc., of Skaneateles, New York. However, the contract was awarded to the joint venture of B. B. McCormick and Bailes-Sey of Jacksonville, Florida, at a cost of around \$2.5 million. The contract called for completion within 180 calendar days (about January 1964), which coincided with the scheduled delivery of large quantities of steel for the VAB (*Spaceport News* 1963b, 1963c). However, because of the FEC labor strike, the NASA KSC Railroad was not completed in its entirety until 1965 (*Spaceport News* 1964).

**United States Department of the Interior
National Park Service**

**NATIONAL REGISTER OF HISTORIC PLACES
CONTINUATION SHEET**

Section number 8 Page 3 NASA KSC Railroad System Historic District
Brevard County, Florida

At the outset of construction, NASA, as well as the Air Force, projected 300,000 carloads of materials to be delivered to KSC by the railroad over the first five years. Based on this figure, the FEC agreed to supply the money for the construction, operation, and maintenance of their 7.5-mile section, as well as the operation and maintenance of the 28-mile portion built by NASA/ACOE; the funds were to come from a “modest switching charge” for the shipment of the loaded railcars. By 1969, the actual traffic over the railroad amounted to only around 10 percent of the projected totals, most of which was along the west branch (Hoffman 1983). This led the FEC to file a lawsuit against NASA over lost revenue; the lawsuit would not be settled until 1983 (KSC-TO n.d.; Hoffman 2012a).

The railroad remained as originally designed and constructed until 1974, when a temporary railroad spur, about 1 mile long, was constructed from the west branch to the Shuttle Landing Facility (SLF). The tracks were used by the SLF contractors to bring rough aggregate and cement into KSC for the construction of the SLF Runway. Railroad cars hauled an estimated 500,000 barrels of cement for the 15,000-foot (ft) long, 300-ft wide landing strip (*Spaceport News* 1974).

The advent of the SSP also “renewed interest in rail transportation as the most practical method of shipping the SRB segments” (*Spaceport News* 1984b:6-7). Each Space Shuttle carried twin SRBs, each comprised of both motor and non-motor segments. The solid rocket motor (SRM) consisted of four motor segments, which contained the fuel to power the SRBs. The SRMs were manufactured by the Thiokol Company in Utah; Thiokol also refurbished the SRMs and reloaded them with propellant following launch and recovery. The major non-motor segments included the nose cap, frustum, and forward and aft skirts. These structural components contained the electronics to guide the SRBs during liftoff, ascent, and ET/SRB separation, and housed the parachutes, which slowed the descent of the reusable boosters into the Atlantic Ocean after their jettison from the spacecraft.

Because of the size of the SRM segments (12-ft diameter and approximately 150-tons each), and hazardous nature, shipment by rail between Utah and KSC was the only practical means of transportation (Heiney 2011). Thus, in 1977, a spur was constructed from the west branch of the railroad into the two west VAB high bays for the delivery of SRB motor segments. The subcontractor for the work was a private firm called Kennedy Railroad of Harrisburg, Pennsylvania; ironically, the president of the company was John Kennedy (*Spaceport News* 1977). The spur was ready for use in 1978.

In the mid-1970s, KSC’s Design Engineering branch developed the layout for the LMF, which was constructed south of the VAB along Contractor Road. As part of the effort, in 1978, KSC purchased an old Army Signal Corps car (U.S. Army 87325) for use as an office/tool room. The car was constructed during World War II as a hospital car, and remodeled in 1950 as the “Presidential Communications Car” that accompanied the “Ferdinand Magellan” armored presidential Pullman whenever the U.S. president travelled by train. U.S. Army 87325, which became NLAX 150 upon its purchase by NASA, was retrofitted for duty by the newly hired railroad crew, which became part of the new Transportation Operations team within KSC. Aside from railroad support, the railroad crew operated heavy-duty tractor trailer trucks. Other tasks of the Transportation Operations team included the maintenance of payload containers used to ship Space Shuttle payloads between their worldwide manufacturing and assembly/checkout facilities and KSC (*Spaceport News* 1978).

In the early 1980s, railroad operations increased to the point that almost daily round trips to the Jay Jay Yard were necessary to pick up and deliver cars to FEC’s mainline connection. In many instances, there were simultaneous runs of

**United States Department of the Interior
National Park Service**

**NATIONAL REGISTER OF HISTORIC PLACES
CONTINUATION SHEET**

Section number 8 Page 4 NASA KSC Railroad System Historic District
Brevard County, Florida

two locomotives and dual train crews, as the trains were typically 10 and 20 cars long (*Spaceport News* 1984b). Around the same time, KSC technicians made the decision to move SRB operations from the VAB to a separate facility, what would become the Rotation, Processing, and Surge Facility (RPSF), located to the north of the VAB. The RPSF was a complex of three buildings, one of which, the Rotation/Processing Building (RPB), was specifically constructed for rotating the SRM segments from horizontal, as delivered, to vertical, for stacking. Construction of the RPB occurred between 1982 and 1984. To assist in the delivery of the SRM segments, a 115-ton railroad track was constructed through the RPB, allowing KSC locomotives to transport segments directly to the facility (ACI 2007; KSC Archives 1982).

In June 1983, after the legal battle following the FEC's 1969 lawsuit, NASA purchased the 7.5-mile spur west of Wilson's Corner, and undertook the complete operation and maintenance of the railroad, including the tracks, the Jay Jay Bridge, and crossings. Unfortunately, portions of the railroad were in poor condition after over 15 years of exposure to the salty air and moist climate. Many of the wood cross ties were rotting, rust had eaten away much of the hardware, and the rail required strengthening to safely handle the hazardous loads. At that point, a three-year railroad repair project was begun (Hoffman 1983; KSC Archives 1981, 1983; *Spaceport News* 1984b; Heiney 2011).

The first step was hiring the Railroad Track Construction Corporation, a subsidiary of the FEC, to repair the tracks, bridge, and crossing signals. This included the replacement of more than six miles of track along the Atlantic Ocean, which had succumbed to rust. When originally constructed, the rail segments were bolted together. During the repairs, 1,000-ft segments of continuous welded rail replaced the original. Between 1984 and 1986, over 35,000 new, lower maintenance concrete cross ties were installed, principally in the west branch, which amounted to approximately one-third of the total ties. Wood cross ties were left at all track switches due to the flexibility of the material (Chesson 2012; KSC Archives 1983). Repair of a 5-mile portion of track along the Atlantic Ocean, between mileposts 11.0E and 16.5E, was completed in June 1984 (KSC Archives 1984, 1987). The track within the Jay Jay Yard and between mileposts 1.0 and 7.5 was completed in 1986 (KSC Archives 1985, 1987). The west branch of the railroad, from mileposts 7.5 and 18.5W, was completed in 1991 (KSC Archives 1991).

Between September and December 1984, the FEC's Railroad Track Construction Company also repaired all road crossings associated with the NASA railroad. When possible, workers used preassembled sections of track and cross ties to expedite the process (*Spaceport News* 1984a). Most of the work occurred on the weekends, under the supervision of David Hoffman, NASA's railroad manager (*Spaceport News* 1984b, 1985).

The NASA KSC Railroad System supported the SSP for three decades by transporting fueled SRM segments from Utah, and by returning spent SRM segments from KSC to Utah. The first set of SRM segments arrived in March 1978; the final set arrived in May 2010. The SRM segments were delivered by the FEC to the Jay Jay Yard, southeast of Mims, where NASA's locomotives retrieved the segments. Prior to moving the segments, technicians thoroughly examined the cars for hazards. Here is where spacer cars also were installed between the segment cars to evenly distribute the weight of the train over the Jay Jay Bridge. The load was carried to the Wilson Yard, where the spacer cars were removed, and the segments were transported to the Suspect Siding, an isolated staging area on the northeast side of the SLF. The cars stayed in this location until the technicians within the RPSF were ready for the segments (Heiney 2011).

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The railroad also was used to transport ground support equipment and construction materials, and conveyed fuel and oxidizer to CCAFS (Heiney 2011; *Spaceport News* 2001). The railroad also served to carry nitrogen tetroxide (an oxidizer), Air Force Titan rockets, Navy Trident missiles, and the SRM segments for the Ares I-X flight test in March 2009 (Heiney 2011). The major commodities delivered by rail during the Apollo era were construction materials for the Crawlerway and other facilities, and liquid helium, used for purging fuel lines at the launch pad.

Jay Jay Railroad Draw Bridge

The Jay Jay Bridge, constructed ca. 1963, is a single-leaf bascule that spans a distance of approximately 0.5 miles across the Indian River. The approach spans were designed by Maurice H. Connell and Associates of Miami, Florida; the bascule main span was designed and assembled by the Nashville Bridge Company. L.O. Hopkins of Nashville, Tennessee, designed the channel piers and fenders. The as-built drawings indicate that fill was dredged from the bottom of the Indian River due south of the bridge to create an approximately 1,500-ft long peninsula on the west side of the river and an approximately 2,000-ft long peninsula on the east (Maurice H. Connell and Associates & Nashville Bridge Company 1963).

Following purchase from the FEC in June 1983, the Jay Jay Bridge underwent much needed repairs. The channel lights and deteriorated bridge fenders were repaired in early 1985 by Inter-Bay Marine Construction, and later that year the electrical system was rewired. The bridge was closed for seven days in early 1987 as a subcontractor, Ivey's Steel Erectors, replaced a deteriorated span (*Spaceport News* 1987). In mid-1989, EG&G workers sandblasted and painted the bridge, work that limited boat passage to every hour and half-hour during the workday. By August of that year, seven spans had been reinforced (*Spaceport News* 1989).

In 1993, the electrical system was reconfigured, and it has been updated since then. The exterior shell of the control house was replaced in March 2008. Several more repairs have been made to the bridge over the years, including the installation of pile jackets; replacement of the track, ties, railing, walkways, piles, and fender system; and corrosion control and repainting (Washburn 2012a, 2012b).

Locomotives

NASA Railroad operations in support of the SSP began with the acquisition of two Alco S-2 diesel locomotives. The 115-ton capacity locomotives were designed for heavy duty road and switching service. Originally manufactured in 1942 by the American Locomotive Company and used by the U.S. Army, they were purchased by NASA in January 1976 as DoD excess property for \$111,870 from the Defense Property Disposal Office, Seneca Army Depot in New York. In addition to transporting SRM segments, the locomotives were used to move other cars and for operations previously accomplished with the KSC carspotter. Following purchase, the locomotives were overhauled in June 1978 by Johnson Railway Service, Inc. at their shop in Cornelia, Georgia. The locomotives were painted black and white prior to their delivery to KSC in July 1978.

On July 24, 1984, NASA acquired three used, as-is, multi-purpose switching locomotives made by General Motors' Electro-Motive Division (EMD) and powered by a EMD 645 engine. These model SW-1500 diesel locomotives were

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built in 1968 (Locomotive 1) and 1970 (Locomotives 2 and 3), and originally were owned by the Toledo, Peoria and Western Railroad (TP&W) as numbers 303, 305, and 306, respectively. With this purchase, the two older Alco S-2 units were declared surplus. The new SW-1500 locomotives contained most of the same parts as the FEC's newest locomotives, ensuring the availability of spare parts and maintenance assistance from the FEC.

Once purchased, the locomotives, known simply as **Locomotives 1, 2, and 3**, were scheduled for minor repairs and a tune-up by the railroad crew, staffed by EG&G under the KSC Base Operations contract. They were then painted in the NASA railroad red, black, and gray color scheme (*Spaceport News* 1984b). The railroad crew used the locomotives for hauling SRM segments, specialized ground support equipment (GSE), and helium and other launch service commodities. In 2004, Locomotive No. 1 received a custom-built lube system designed by the railroad crew, due to a lubrication failure preventing the crankshaft and bearings from receiving oil. Because the vehicle had to be disassembled down to the engine block, other major maintenance was completed at the same time (Diller 2004). In 2008, Locomotive 3 was painted black, blue, and white with red stripes as a result of a 15-month corrosion repair project (*Spaceport News* 2008).

NLAX 170 and NLAX 171

NLAX 170 and NLAX 171 were built for NASA specifically to transport solid rocket booster (SRB) components. Davidson-Kennedy Company of Atlanta, Georgia, was awarded the contract to build the cars on July 22, 1983, and they subcontracted the carbody design to Nelson Associates of Springfield, Virginia. The railcars were slow to receive Association of American Railroad approval, likely because of their uncommon design. They cost \$84,571 each and arrived at the KSC on April 19, 1985 (KSC-TO, Folder No. 6670-5-171).

According to July 30, 1987, correspondence, the cars traveled from NASA's Marshall Space Flight Center and McDonnell Douglas Astronautics Company West in Huntington Beach, California, where the components were manufactured, to KSC. Before NLAX 170 and NLAX 171, these four SRB components required three trucks and a railcar for transport. They are the only two of their kind in the world, and the NASA Railroad crew referred to them as "Carnival Cars" because of their unique appearance.

HISTORICAL SIGNIFICANCE

The NASA KSC Railroad System Historic District is considered eligible for inclusion on the NRHP in the context of the U.S. Space Shuttle Program (ca. 1969 - 2011) under Criterion A for its significant historical associations in the areas of Space Exploration and Transportation. Because it has achieved exceptional national significance in the last 50 years, Criteria Consideration G applies. The period of significance for the NASA KSC Railroad System Historic District extends from 1978, when the first flight SRM segments arrived at KSC, to 2010, when the final set of SRM segments arrived at the center. The railroad track, including the bridge, was used throughout the SSP to carry fueled and spent SRM segments from KSC to the Jay Jay Yard (Heiney 2011; *Spaceport News* 2001). Because of the size of the SRM segments (12-foot wide), weight (150-tons each), and hazardous nature, shipment by rail was the only practical means of transport (Heiney 2011).

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The three locomotives were crucial to the NASA Railroad's support of the SSP; everything that entered the KSC from 1984 to 2010 via the railroad was transported by one of these three locomotives. In addition, the railroad supported the delivery of SRB aft skirts, forward skirts, and frustums from California to KSC, via the NLAX 170 and NLAX 171 railcars. Each of these cars was capable of carrying one frustum, one forward skirt, and two aft skirts.

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1984b "We've Been Working on the Railroad." 26 October:6-7.
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Wasburn, Frank (KSC Bridge technician)

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2012b Interview by Christopher Berger. 13 March. Notes on file at Archaeological Consultants Inc., Sarasota.

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Location and Mapping

Township/Range/Section

21S/35E/21, 23, 24
21S/36E/19, 20, 21, 22, 23, 24, 26, 27, 35, 36
21S/37E/19, 20, 21, 27, 28, 34
22S/36E/1, 12
22S/37E/2, 3, 7, 8, 18, 19, 30, 31
23S/37E/5

USGS 7.5' Maps:

False Cape, Fla. 1976, PI 1984
Mims, Fla. 1949, PR 1970
Orsino, Fla. 1976
Wilson, Fla. 1949, PR 1979

Verbal Boundary Description

The west boundary of the NASA Railroad is the point where it meets the Florida East Coast Line in Titusville. There are two south boundaries: one where the west branch ends within the Kennedy Space Center (KSC) Industrial Area, the other where the east branch reaches the boundary between KSC and Cape Canaveral Air Force Station (CCAFS). There is also an east boundary at the Compressor/Converter Facility, just east of the Vehicle Assembly Building (VAB) Area. The width of the resource is defined as the width of the railroad bed.

Boundary Justification

This includes all historically significant NASA KSC Railroad assets associated with the Space Shuttle Program.

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PHOTOGRAPHS

1. Jay Jay Yard, NASA KSC Railroad System Historic District
2. Brevard County, Florida
3. Christopher Berger
4. January 2012
5. Archaeological Consultants, Inc.
6. Looking west
7. Photo 1 of 13

Items 2 and 5 are the same for photographs 2-34.

1. Jay Jay Bridge showing railroad track, NASA KSC Railroad System Historic District
3. Christopher Berger
4. January 2012
6. Looking southwest
7. Photo 2 of 13

1. Detail view of railroad track, NASA KSC Railroad System Historic District
3. Christopher Berger
4. January 2012
6. Looking west
7. Photo 3 of 13

1. Detail view of Wilson Yard, NASA KSC Railroad System Historic District
3. Christopher Berger
4. January 2012
6. Looking west
7. Photo 4 of 13

1. Detail view of railroad track, NASA KSC Railroad System Historic District
3. Trish Slovinac
4. January 2012
6. Looking south
7. Photo 5 of 13

1. Detail view of railroad track at RPSF, NASA KSC Railroad System Historic District
3. Christopher Berger
4. January 2012
6. Looking east
7. Photo 6 of 13

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1. Detail view of railroad track at LMF, NASA KSC Railroad System Historic District
3. Christopher Berger
4. January 2012
6. Looking south
7. Photo 7 of 13

1. View of Jay Jay Bridge, NASA KSC Railroad System Historic District
3. Christopher Berger
4. January 2012
6. Looking southeast
7. Photo 8 of 13

1. Detail view of Jay Jay Bridge bascule, NASA KSC Railroad System Historic District
3. Trish Slovinac
4. June 2012
6. Looking south
7. Photo 9 of 13

1. Detail view of Locomotive 3, NASA KSC Railroad System Historic District
3. Christopher Berger
4. January 2012
6. Looking northwest
7. Photo 10 of 13

1. Detail view of Locomotive 1, NASA KSC Railroad System Historic District
3. Christopher Berger
4. January 2012
6. Looking southeast
7. Photo 11 of 13

1. Detail view of NLAX 170, NASA KSC Railroad System Historic District
3. Trish Slovinac
4. June 2012
6. Looking southwest
7. Photo 12 of 13

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1. Detail view of NLAX 170, NASA KSC Railroad System Historic District
3. Trish Slovinac
4. June 2012
6. Looking north
7. Photo 13 of 13

NASA KSC RAILROAD SYSTEM HISTORIC DISTRICT-PHOTOS



PHOTO 1, Jay Jay Yard, looking west



PHOTO 2, Jay Jay Bridge showing railroad track, looking southwest

NASA KSC RAILROAD SYSTEM HISTORIC DISTRICT-PHOTOS



PHOTO 3, Detail view of railroad track, looking west



PHOTO 4, Detail view of Wilson Yard, looking west

NASA KSC RAILROAD SYSTEM HISTORIC DISTRICT-PHOTOS



PHOTO 5, Detail view of railroad track, looking south



PHOTO 6, Detail view of railroad track at RPSF, looking west

NASA KSC RAILROAD SYSTEM HISTORIC DISTRICT-PHOTOS



PHOTO 7, Detail view of railroad track at LMF, looking south



PHOTO 8, View of Jay Jay Bridge, looking southeast

NASA KSC RAILROAD SYSTEM HISTORIC DISTRICT-PHOTOS



PHOTO 9, Detail view of Jay Jay Bridge bascule, looking south



PHOTO 10, Detail view of Locomotive 3, looking northwest

NASA KSC RAILROAD SYSTEM HISTORIC DISTRICT-PHOTOS



PHOTO 11, Detail view of Locomotive 1, looking southeast

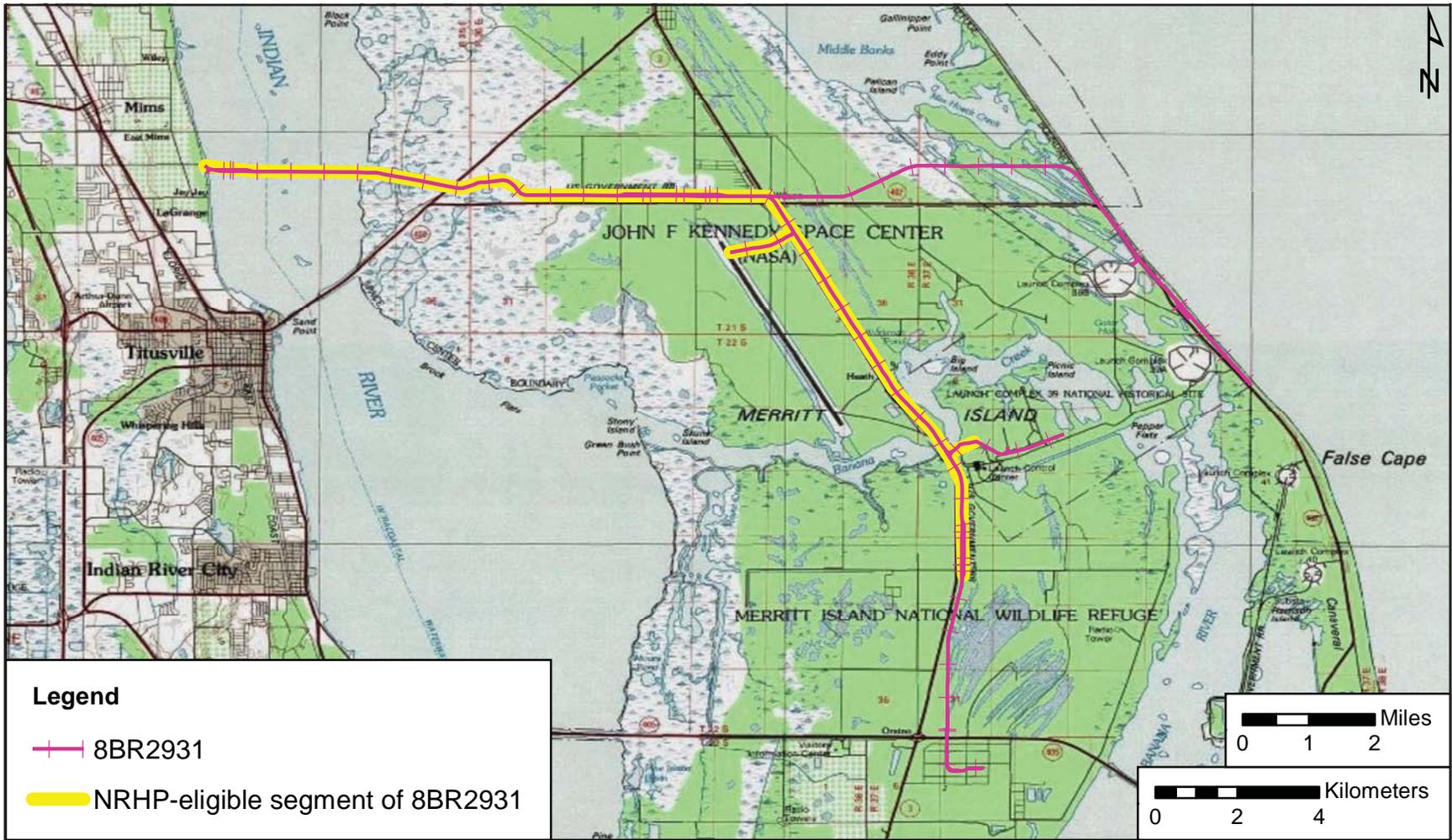


PHOTO 12, Detail view of NLAX 170, looking southwest

NASA KSC RAILROAD SYSTEM HISTORIC DISTRICT-PHOTOS



PHOTO 13, Detail view of NLAX 170, looking north



Location of NASA KSC Railroad Track (8BR2931) and the NRHP-eligible segment.



APPENDIX C: List of Acronyms

LIST OF ACRONYMS

ACI	Archaeological Consultants, Inc.
ACOE	Army Corps of Engineers
ASTP	Apollo-Soyuz Test Project
ATSF	Atchison, Topeka, & Sante Fe Railway Company
CAIB	Columbia Accident Investigation Board
CCAFS	Cape Canaveral Air Force Station
CCF	Compression/Converter Facility
CFR	Code of Federal Regulations
DoD	Department of Defense
DOT	Department of Transportation
EMD	Electro-Motive Division (of General Motors)
ET	External Tank
FEC	Florida East Coast Railway
FMSF	Florida Master Site File
GSE	Ground Support Equipment
IHA	InoMedic Health Applications
ISS	International Space Station
JSC	Johnson Space Center
KSC	Kennedy Space Center
KSC-TO	Kennedy Space Center Transportation Office
LC	Launch Complex
LMF	Locomotive Maintenance Facility
MFL	Missile Firing Laboratory
MILA	Merritt Island Launch Area
MSFC	Marshall Space Flight Center
NASA	National Aeronautics and Space Administration
NRHP	National Register of Historic Places
OV	Orbiter Vehicle
RPB	Rotation/Processing Building
RPSF	Rotation, Processing and Surge Facility
SLF	Shuttle Landing Facility
SRB	Solid Rocket Booster
SRM	Solid Rocket Motor
SSME	Space Shuttle Main Engine
SSP	Space Shuttle Program
STG	Space Task Group
STS	Space Transportation System
TP&W	Toledo, Peoria and Western Railroad
U.S.	United States
USSR	Union of Soviet Socialist Republics
VAB	Vehicle Assembly Building

APPENDIX D: List of Railcars owned by KSC, as of June 13, 2012

List of 42 Railcars and Locomotives owned by KSC, as of June 13, 2012
 Provided by John W. Thiers, Quality Assurance Specialist, KSC Transportation Office

NLAX Number	Description
NLAX 40	70-Ton Flat Spacer
NLAX 41	70-Ton Flat Spacer
NLAX 42	100-Ton Flat
NLAX 48	100-Ton Flat
NLAX 49	100-Ton Flat
NLAX 100	100-Ton, 74-Ft Gondola
NLAX 107	100-Ton Triple Hopper
NLAX 108	100-Ton Triple Hopper
NLAX 111	100-Ton Triple Hopper
NLAX 112	100-Ton Triple Hopper
NLAX 117	100-Ton Triple Hopper
NLAX 118	100-Ton Triple Hopper
NLAX 121	55-Ton, 90-Ft Flat
NLAX 122	90-Ft Flat
NLAX 124	90-Ton, 65-Ft Flat
NLAX 125	100-Ton, 60-Ft Flat
NLAX 127	100-Ton, 60-Ft Flat
NLAX 142	70-Ton, 89-Ft Pig Flat
NLAX 153	Cover Car
NLAX 154	Cover Car
NLAX 160	90-Ft Flat
NLAX 161	90-Ft Flat
NLAX 162	90-Ft Flat
NLAX 163	90-Ft Flat
NLAX 170	70-Ton Aft Skirt
NLAX 171	70-Ton Aft Skirt
NLAX 175	60-Ft Gondola
NLAX 177	60-Ft Gondola
NLAX 178	60-Ft Gondola
NLAX 179	60-Ft Gondola
NLAX 180	100-Ton Triple Hopper
NLAX 191	100-Ton Tank
NLAX 194	70-Ton Water
NLAX 197	100-Ton Tank
NLAX 198	100-Ton Tank
NLAX 890	100-Ton Tank
NLAX 4005	70-Ton Boxcar
AF35819	100-Ton Flat
AF35851	100-Ton Flat
Locomotive 1	Locomotive
Locomotive 2	Locomotive
Locomotive 3	Locomotive

APPENDIX E: Survey Log

Ent D (FMSF only) ___/___/___



Survey Log Sheet

Florida Master Site File
Version 4.1 1/07

Survey # (FMSF only) _____

Consult *Guide to the Survey Log Sheet* for detailed instructions.

Identification and Bibliographic Information

Survey Project (name and project phase) Historical Survey and Evaluation of the NASA KSC Railroad System

Report Title (exactly as on title page) Historical Survey and Evaluation of the Jay Jay Bridge, Railroad System, and Locomotives, John F. Kennedy Space Center, Brevard County, Florida

Report Author(s) (as on title page— individual or corporate; last names first) Joan Deming, Trish Slovinac, Christopher Berger
Archaeological Consultants, Inc. (ACI)

Publication Date (year) 2012 Total Number of Pages in Report (count text, figures, tables, not site forms) 69

Publication Information (Give series and no. in series, publisher and city. For article or chapter, cite page numbers. Use the style of *American Antiquity*.)
Archaeological Consultants, Inc., P.O. Box 5103, Sarasota, FL 34277-5103

Supervisor(s) of Fieldwork (whether or not the same as author(s); last name first) Trish Slovinac

Affiliation of Fieldworkers (organization, city) ACI

Key Words/Phrases (Don't use the county, or common words like *archaeology, structure, survey, architecture*. Limit each word or phrase to 25 characters.) Kennedy Space Center, NASA KSC Railroad System, Jay Jay Bridge

Survey Sponsors (corporation, government unit, or person who is directly paying for fieldwork)

Name NASA-John F. Kennedy Space Center

Address/Phone _____

Recorder of Log Sheet Trish Slovinac Date Log Sheet Completed 11 /14 /12

Is this survey or project a continuation of a previous project? No Yes: Previous survey #(s) (FMSF only) _____

Mapping

Counties (List each one in which field survey was done - do not abbreviate; use supplement sheet if necessary) Brevard

USGS 1:24,000 Map(s) : Map Name/Date of Latest Revision (use supplement sheet if necessary): False Cape, Fla. 1976, PR 1984; Mims, Fla. 1949, PR 1970; Orsino, Fla. 1976; Wilson, Fla. 1949, PR 1979

Description of Survey Area

Dates for Fieldwork: Start 02/15/12 End 02/16/12 Total Area Surveyed (fill in one) _____ hectares _____ acres

Number of Distinct Tracts or Areas Surveyed 1

If Corridor (fill in one for each): Width _____ meters _____ feet Length _____ kilometers _____ miles

Research and Field Methods

Types of Survey (check all that apply): archaeological architectural historical/archival underwater other: _____

Preliminary Methods (✓ Check as many as apply to the project as a whole.)

- Florida Archives (Gray Building) library research- *local public* local property or tax records other historic maps
- Florida Photo Archives (Gray Building) library-special collection - *nonlocal* newspaper files soils maps or data
- Site File property search Public Lands Survey (maps at DEP) literature search windshield survey
- Site File survey search local informant(s) Sanborn Insurance maps aerial photography
- other (describe) NASA archives at KSC; as-built drawings at KSC

Archaeological Methods (✓ Check as many as apply to the project as a whole.)

Check here if **NO** archaeological methods were used.

- surface collection, controlled other screen shovel test (size: _____) block excavation (at least 2x2 M)
- surface collection, uncontrolled water screen (finest size: _____) soil resistivity
- shovel test-1/4" screen posthole tests magnetometer
- shovel test-1/8" screen auger (size: _____) side scan sonar
- shovel test 1/16" screen coring unknown
- shovel test-unscreened test excavation (at least 1x2 M)
- other (describe): _____

Historical/Architectural Methods (✓ Check as many as apply to the project as a whole.)

Check here if **NO** historical/architectural methods were used.

- building permits demolition permits neighbor interview subdivision maps
- commercial permits exposed ground inspected occupant interview tax records
- interior documentation local property records occupation permits unknown
- other (describe): NASA real property records, as-built drawings, historical photos

Scope/Intensity/Procedures Archival research, informant interviews, historical/architectural field survey; preparation of FMSF form; report preparation

Survey Results (cultural resources recorded)

Site Significance Evaluated? Yes No If Yes, circle NR-eligible/significant site numbers below.

Site Counts: Previously Recorded Sites 0 Newly Recorded Sites 27

Previously Recorded Site #'s with Site File Update Forms (List site #'s without "8." Attach supplementary pages if necessary) _____

Newly Recorded Site #'s (Are you sure all are originals and not updates? Identify methods used to check for updates, i.e., researched Site File records.

List site #'s without "8." Attach supplementary pages if necessary.) BR2906, BR2907, BR2908, BR2909, BR2910, BR2911,

BR2912, BR2913, BR2914, BR2915, BR2916, BR2917, BR2918, BR2919, BR2920, BR2921, BR2922, BR2923,

BR2924, BR2925, BR2926, BR2927, BR2928, BR2929, BR2930, BR2931, BR2932, BR3042, BR3043, BR3044

Site Form Used: Site File Paper Form SmartForm II Electronic Recording Form

REQUIRED: ATTACH PLOT OF SURVEY AREA ON PHOTOCOPIES OF USGS 1:24,000 MAP(S)

DO NOT USE

SITE FILE USE ONLY

DO NOT USE

BAR Related

- 872 1A32 # _____
- CARL UW _____

BHP Related

- State Historic Preservation Grant
- Compliance Review: CRAT # _____

SURVEY LOG

NASA KSC Railroad, Jay-Jay Bridge, and Locomotive Maintenance Facility

21S/35E/21, 23, 24

21S/36E/19, 20, 21, 22, 23, 24, 26, 27, 35, 36

21S/37E/19, 20, 21, 27, 28, 34

22S/36E/1, 12

22S/37E/2, 3, 7, 8, 18, 19, 30, 31

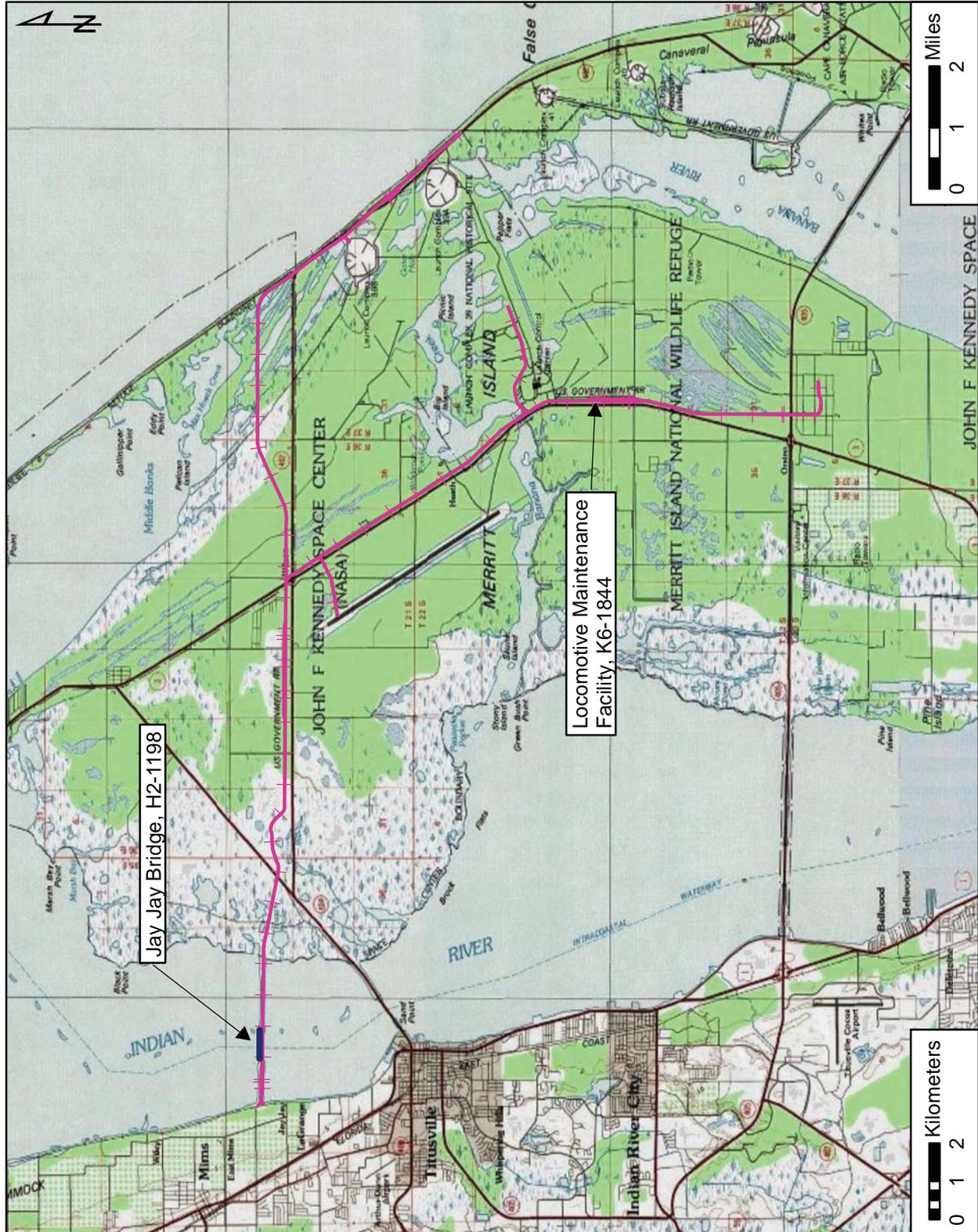
23S/37E/5

False Cape, Fla. 1976, PI 1984

Mims, Fla. 1949, PR 1970

Orsino, Fla. 1976

Wilson, Fla. 1949, PR 1979



Pink denotes extent of the NASA KSC Railroad Track. National Geographic Society (2011) *USA Topo Maps*.