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Cultural Resource Management Plan for Brookhaven National Laboratory

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DISCLAIMER

Acronyms and Abbreviations

ACHP	Advisory Council on Historic Preservation
ACS	American Chemical Society
ADS	Activity Data Sheet system
AGS	Alternating Gradient Synchrotron
APS	American Physical Society
AIRFA	American Indian Religious Freedom Act
ARPA	Archeological Resource Protection Act
BGRR	Brookhaven Graphite Research Reactor
BMRR	Brookhaven Medical Research Reactor
BNL	Brookhaven National Laboratory (also, “Laboratory”)
BSA	Brookhaven Science Associates
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CR	Cultural Resources
CRM	Cultural Resource Management
CRMP	Cultural Resource Management Plan
CURL	Current Unfunded Requirements List
D&D	Decontamination and Decommissioning
DOE	Department of Energy
DOE-BHSO	Department of Energy Brookhaven Site Office
EIMS	Environmental Information Management System
EMS	Environmental Management System
EPD	Environmental Protection Division
ESH	Environmental Safety and Health Directorate
FY	Fiscal Year
GIS	Geographic Information System
HFBR	High Flux Beam Reactor
ILIA	Institute for Long Island Archeology
ISABELLE	Intersecting Storage Accelerator (+ *BELLE* for “beauty”)
ISO	International Organization for Standardization
LIHJ	Long Island Historic Journal
NAGPRA	Native Americans Graves Protection and Repatriation Act
NFPA	National Fire Protection Act
NHPA	National Historic Preservation Act
NRHP	National Register of Historic Places (also, “National Resister”)
NYAC	New York Archaeological Council
NYSDEC	New York Sate Department of Environmental Conservation
NYSHPO	New York State Historic Preservation Officer (also, “SHPO”)
PAL	Public Archaeology Laboratory, Inc
SCR	Stakeholder & Community Relations
SER	Site Environmental Report
SOP	Standard Operating Procedure
SPLIA	Society for the Preservation of Long Island Antiquities
STP	Shovel Test Pit

Contents

List of Figures

1.0 INTRODUCTION

The Cultural Resource Management Plan (CRMP) for Brookhaven National Laboratory (BNL) provides an organized guide that describes or references the facets and interrelationships of cultural resources at BNL.

Management strategies included within this CRMP are designed to adequately identify the cultural resources that BNL and DOE consider significant and to acknowledge associated management actions. A principal objective of the CRMP is to reduce the need for additional regulatory documents and to serve as the basis for a formal agreement between the DOE and the New York State Historic Preservation Officer (NYSHPO).

The BNL CRMP is designed to be a "living document." Each section includes identified gaps in the management plan, with proposed goals and actions for addressing each gap. The plan will be periodically revised to incorporate new documentation. The current (2023) update incorporates new findings and/or updated text based on completed or ongoing projects related to cultural resources at BNL since inception of the last updated CRMP in 2013.

Historically, Brookhaven National Laboratory had little need for cultural resource management because many of its buildings were less than 50 years old. Most of the features that are potentially eligible for inclusion in the National Register of Historic Places were protected simply by avoiding the features. Compliance with cultural resource laws and regulations has included archeological surveys, such as those associated with the 1977 Final Environmental Impact Statement for Brookhaven National Laboratory and the 1978 Final Environmental Impact Statement for the Proton-Proton Storage Accelerator Facility (ISABELLE). In 1979, World War I trenches associated with the former Camp Upton and located near ISABELLE were determined to be eligible for inclusion in the National Register of Historic Places; however, many of these trenches had been destroyed by construction work. In 1991, the NYSHPO provided BNL with a letter indicating that only three structures and features were likely to be eligible for inclusion in the National Register of Historic Places. Between 1991 and 1999, little work associated with cultural resource management was accomplished. Beginning in 1999, awareness for the need of a program to manage cultural resources grew out of the realization that over half of the buildings at BNL were either 50 years old or were reaching that age and were, therefore, subject to the requirements in Section 106 of the National Historic Preservation Act. This fact, concomitant with the decontamination and decommissioning of the Brookhaven Graphite Research Reactor (BGRR) and the subsequent determination of BGRR's eligibility for listing as an historical site, fueled the need for developing and implementing a more structured program for managing cultural resources at BNL.

2.0 CULTURAL RESOURCE MANAGEMENT GOALS

The BNL Cultural Resource Management Program has been developed to achieve the following goals:

- Maintain regulatory compliance.
- Identify and document all facets of BNL's cultural resources.
- Ensure that stewardship responsibilities are met.
- Increase recognition and availability for public and research interpretation.

One of the major goals of the Cultural Resource Management (CRM) program is to fully assess both known and potential cultural resources. The range of BNL cultural resources includes buildings and structures, WW I earthwork and foundational features, the Camp Upton Historical Collection, scientific

equipment and memorabilia, photo and video archives, and institutional records (plan drawings, public relations archives, etc.). Cultural resources are assessed starting from the potential for prehistoric and historic Native American artifacts and sites, mid-nineteenth century homesteads, and through the site's development during the twentieth century as a government owned facility. Identifying cultural resources associated with various cultural eras is essential to ensure that the history of BNL and the BNL site is complete and available for future interpretation.

As various cultural resources are identified, plans for their long-term stewardship will be developed and implemented. Responsibility for stewardship includes maintenance, mitigation, preservation, and protection issues. Stewardship actions may include formally identifying artifacts; documenting and designating responsibility for historical assets such as documents, photos, and tapes; protecting items ranging from earthwork features to scientific equipment; maintaining significant building features; and curating historical collections.

Few individuals working at BNL, or local community members, are fully aware of the history of the BNL site. Another primary goal of the CRM program is to present opportunities to inform both the internal and external communities. Potential avenues for new outreach include but are not limited to establishing a cultural resources website, developing historic features tours, pamphlets and videos, and making presentations to various community gatherings.

Achieving these goals will ensure that the contributions BNL science and the BNL site have made to our history and culture are documented and available for interpretation. The information presented in the subsequent sections of the Cultural Resource Management Plan provides the roadmap toward achieving these goals.

3.0 EXISTING CONDITIONS

This section of the CRMP contains an overview of BNL's past accomplishments and existing conditions related to cultural resources. Descriptions of the facility's natural setting and operational context are provided, along with the cultural/historical context and known cultural resources. Programmatic and regulatory aspects are also addressed. The objective of this section is to present details of BNL's history, current operations, management, and compliance programs to provide an accurate perspective on how cultural resource management issues have evolved.

3.1 FACILITY AND CULTURAL RESOURCE PROGRAM DESCRIPTIONS

Note: The information presented in Sections 3.1.1 and 3.1.2 was adapted from the 2021 BNL Site Environmental Report (BNL 2022). The SER contains maps, photos, and the original references used to develop this information.

3.1.1 Current Physical Setting

Brookhaven National Laboratory is located near the geographical center of Suffolk County, Long Island, New York. BNL is in Brookhaven Township, about 60 miles east of New York City. Most of BNL's principal facilities are located near the center of the 5,265-acre (8.23 square mile) site. The developed area encompasses approximately 1,820 acres, consisting of:

- 500 acres originally developed by the Army (as part of WW II Camp Upton) and still used for offices and other operational buildings.
- 200 acres occupied by large, specialized research facilities.
- 520 acres occupied by outlying facilities, such as the Sewage Treatment Plant, research agricultural fields, housing facilities, and fire breaks.
- 400 acres of roads, parking lots, and connecting areas.
- 200 acres developed for the Long Island Solar Farm

The balance of the site, approximately 3,400 acres, is largely wooded and represents a native pine barrens ecosystem. In November 2000, DOE set aside 530 acres of the undeveloped land at BNL as the Upton Ecological and Research Reserve (see Figure 3.1-1). The Upton Reserve preserves this portion of the pine barrens ecosystem and provides an area for ecological research and education activities. Several additional areas have been set aside to meet requirements for LEED certification for construction projects (Integrated Science Building I, Center for Functional Nanomaterials, and NSLS-II), and as an environmental benefit for the life of the Long Island Solar Farm. **Note**: The white areas within Figure 3.1-1 map indicate developed or cleared areas of the BNL site.

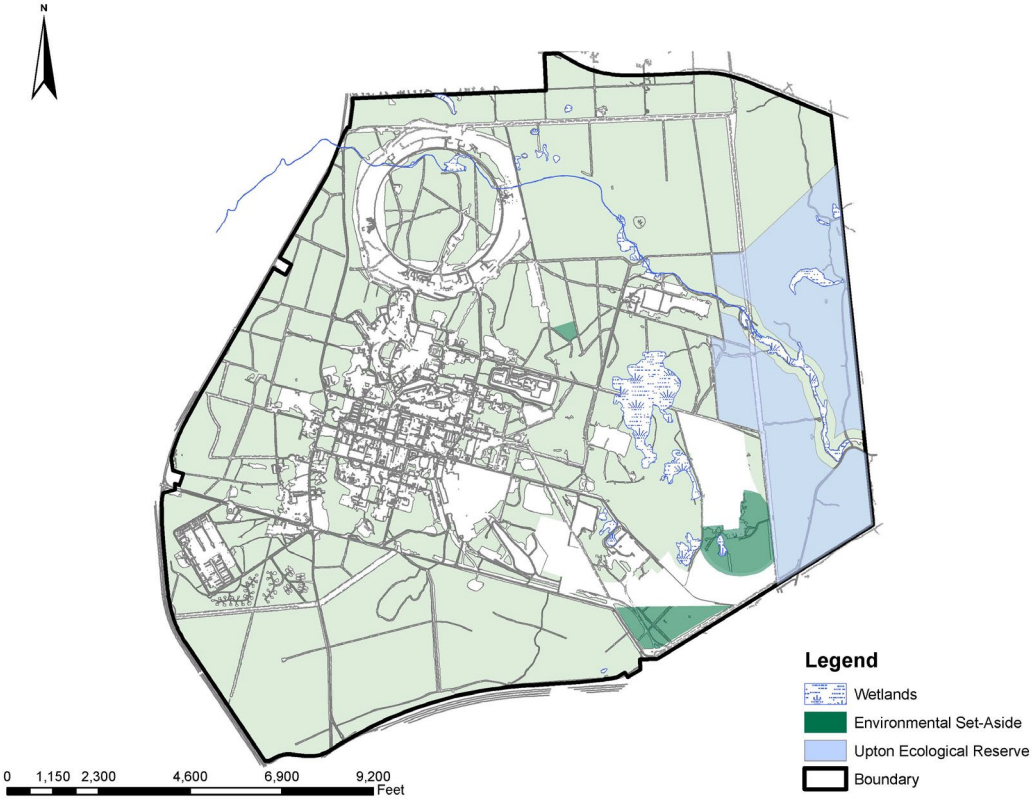

Figure 3.1-1 Map of the Upton Reserve Area and Environmental Set Asides

3.1.1.1 Geology and Hydrology. BNL lies on the western rim of the shallow Peconic River watershed. The marshy areas in the northern and eastern sections of the site are part of the headwaters of the Peconic River. Depending on the position of the water table relative to the base of the riverbed, the Peconic River both recharges to, and receives water from, the sole source aquifer system below Long Island. In times of sustained drought, the river water typically recharges to the groundwater. When precipitation is normal to above normal, the river receives water from the groundwater.

In general, the terrain of the site is gently rolling, with elevations varying between 44 and 120 feet above sea level. Depth to groundwater from the surface of the land ranges from 5 feet near the Peconic River to about 80 feet in the higher areas in the central and western portions of the site. Studies of Long Island hydrology and geology in the vicinity of the Laboratory indicate that the uppermost Pleistocene deposits, composed of highly permeable glacial sands and gravel, are between 120 and 250 feet thick (BNL 2022). Water penetrates these deposits readily and there is little direct runoff into surface streams unless precipitation is intense. These sandy deposits store large quantities of water called the Upper Glacial

Aquifer. On average, about half of the annual precipitation is lost to the atmosphere through evapotranspiration, and the other half percolates through the soil to recharge the groundwater (BNL 2022). The area has a high recharge rate (22 inches per year) that varies seasonally. Groundwater flow direction across the BNL site is influenced by natural drainage systems moving eastward along the Peconic River, southeast toward the Forge River, and south toward the Carmans River. Pumping from on-site water supply wells impacts the direction and speed of groundwater flow, especially in the central, developed areas of the site. Two natural groundwater divides have been identified near BNL (BNL 2022). One divide is located approximately one-half mile north of BNL and a second divide transects portions of the site when the water table is high, and the aquifer flows into the streambed of the Peconic River. These divides define the boundaries of the area contributing groundwater to the Peconic River watershed. In most areas at BNL, the horizontal velocity of groundwater is approximately 0.75 to 1.2 feet per day (BNL 2022). In general terms, groundwater takes approximately 20 to 22 years to travel from the central, developed area of the site to the BNL southern boundary.

3.1.1.2 Climatic Data. The Meteorological Group at Brookhaven National Laboratory has collected meteorological data on site since 1949. The Site Environmental Report (BNL 2022) contains figures such as the annual wind rose for BNL and graphs comparing annual precipitation and temperature data with additional historic climatic data.

The prevailing ground-level winds at BNL are from the southwest during the summer, from the northwest during the winter, and about equally from these two directions during the spring and fall (BNL 2022).

The average annual precipitation for BNL is approximately 48 inches. The total annual precipitation in 2021 was 49 inches. The yearly snowfall for -2021 was 30.8 inches slightly below the 33inches averaged yearly. The average yearly temperature for this area of Long Island in 2021 was 52.9^{o} F. (BNL 2021)

3.1.1.3 Ecological Resources. BNL is located in the oak/chestnut forest region of the Coastal Plain. BNL property constitutes about 5 percent of the 105,000-acre New York State designated region known as the Central Pine Barrens. Additionally, the Peconic River running through BNL's property was designated "scenic" by the New York State Wild, Scenic, and Recreational River System Act. As noted, because of the general topography and porous soil, the land is very well drained and generally there is little surface runoff or open standing water. However, depressions form small pocket wetlands with standing water on a seasonal basis (vernal pools), and there are six significant regulated wetlands on site. Thus, a mosaic of wet and dry areas on the site correlates with variations in topography and depth to the water table. Vegetation onsite is in various stages of succession, which reflects a history of disturbances to the area. The past disturbances with the most impact were tree clear-cutting (the land was cleared extensively prior to 1947 when the site was Camp Upton), fire, local flooding, and draining.

More than 350 plant, 30 mammal, 134 bird, 13 amphibian, 12 reptile, and 10 fish species have been identified on site, some of which are New York State threatened, endangered, exploitably vulnerable, and species of special concern. The white-tailed deer density is currently being managed and as of spring 2022 was estimated at approximately 31 deer per square mile. This compares to the ~145 per square mile estimated in 2003. At least 85 species of birds are known to nest at BNL, and an additional 130 species have been documented as "visiting" the site. These numbers are a result of BNL's location within the Atlantic Flyway and the scrub/shrub habitats that offer food and rest to migratory songbirds. Open fields bordered by hardwood forests at the recreation complex are excellent hunting areas for hawks. Permanently flooded retention basins and other watercourses support amphibians and aquatic reptiles. Recent ecological studies have confirmed 26 breeding sites for the New York State endangered eastern tiger salamander in ponds and recharge basins. The banded sunfish and the swamp darter, both of which are threatened in New York State have been identified at the site historically. Multiple other threatened and endangered species are located on or are expected to exist onsite. BNL natural resource management activities work to ensure suitable habitat exists for threatened and endangered species.

As mentioned earlier, the Upton Ecological and Research Reserve was established to preserve a section of the Central Pine Barrens, a unique ecosystem of forests and wetlands on Long Island. At 530 acres, the Upton Ecological and Research Reserve sets aside 10 percent of BNL property for conservation and ecological research. This area provides habitat for approximately 27 endangered, threatened, or species of special concern, including the endangered eastern tiger salamander and the state-threatened banded sunfish and swamp darter. Other wildlife species of interest that inhabit this area include the wild turkey, red fox, eastern box turtle, and the red-tailed hawk. More information about the Reserve and the plants and animals it protects can be found in Chapter 6 of the SER (BNL 2021).

3.1.2 Current Operational Context

Brookhaven Science Associates, LLC (BSA) operates BNL for the Department of Energy. BSA is a 50-50 partnership of the Battelle Memorial Institute and the Research Foundation of the State University of New York on behalf of the State University of New York at Stony Brook. BSA began operating the Laboratory on March 1, 1998, through an agreement with DOE and continues to operate the Laboratory after winning the contract in 2014 (Contract No. DE-SC0012704). Approximately 2,600 resident scientists and support staff work at BNL. In addition, more than 5,000 academic and industrial users from all over the world visit the site each year to participate in scientific collaborations.

As a U.S. Department of Energy (DOE) Office of Science laboratory, BNL has a strong focus on fundamental science—particularly in nuclear and high energy physics; clean energy and climate; quantum information science and technology; human-Artificial Intelligence-facility integration; isotope production; and accelerator science and technology—all enabled by its unique suite of powerful facilities and capabilities, led by its remarkable staff. BNL conceptualizes, designs, builds, and operates major scientific facilities in support of its DOE mission. These facilities serve DOE's basic research needs and reflect BNL/DOE stewardship of national research infrastructure critical for university, industry, and government researchers.

The Laboratory's high-level, enduring science and technology (S&T) priorities define and distinguish BNL. They fall broadly into the following areas:

- Discovery Science and Technology to address national needs such as:
    - Nuclear and particle physics to gain a deeper understanding of matter, energy, space, and time.
    - Recognized strengths in advanced materials, catalysis, bioenergy, environmental systems, and climate to put the U.S. on a path to a net-zero economy.
    - Advanced computer science, applied math, data science, and computational science to transform scientific discovery at BNL's facilities and enhance its science programs; and
- Advanced and emerging technology with demonstrated strengths in instrumentation, magnet, accelerator, and laser S&T.
- Transformational user facilities that position the Laboratory and the Nation for continued leadership roles in science and technology. These facilities are enabled by advanced accelerator science and technology.
- Application of the results of BNL' s discovery science to address emerging opportunities, including clean energy solutions, isotopes, national security solutions, and national emergencies.

BNL's early research focused on advanced physics, specifically nuclear research in the fields of medicine, biology, chemistry, physics, and nuclear engineering; but it has since expanded into chemistry, materials science, biology, medicine, and environmental research. The Laboratory's large and unique scientific user

facilities make this research possible, providing the tools for BNL scientists and visiting researchers to extend the boundaries of knowledge and technology. Brookhaven's newest accelerator facility, the Relativistic Heavy Ion Collider (RHIC) began operations in 2000. The RHIC is designed to recreate a state of matter that scientists believe existed moments after the universe was formed. At the time of this update BNL is planning on the next phase of high energy physic in which the RHIC facility will be transformed into the Electron-Ion Collider (EIC) effectively incorporating an electron accelerator with the heavy ion accelerators in order to use electron beams to peer into collisions and the fundamental workings of subatomic particles. New facilities such as the Center for Functional Nanomaterials (CFN), which began operation in 2007, conduct nano-scale research on materials to accelerate new technologies in energy, drug delivery, sensors, and industrial processes. The National Synchrotron Light Source II (NSLS-II) came online in 2014 replacing the original NSLS which has been decommissioned and dismantled allowing Bldg. 725 to be repurposed for the Computation Science Initiative, and the Inter-disciplinary Science Building, which completed construction in 2012, all will be involved in new discoveries in materials science, physics, computation science, and other disciplines.

Unfortunately, historical operations and waste management practices at the Laboratory led to the release of chemicals and radioactive materials that resulted in soil and groundwater contamination. In 1989, BNL was added to the National Priorities List of environmentally contaminated sites established by the federal Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), and was identified for priority cleanup. BNL has made significant progress toward improving environmental operations and remediation of past contamination. In 2001, BNL's Environmental Management System (EMS) was registered by an independent, accredited organization to the International Organization for Standardization (ISO) 14001 environmental management standard. BNL's Environmental, Safety, Security, and Health Policy can be reviewed at the following website link:

https://www.bnl.gov/esh/policy.php

The major scientific facilities at BNL are shown and briefly described in Figure 3.1-2. In addition to the scientific facilities, the location of other facilities supporting BNL's science and technology mission are identified in the Site Environmental Report (https://www.bnl.gov/esh/env/ser/).

3.1.3 Potential Impacts to Cultural Resources

3.1.3.1 Past Practices. Although the property was essentially undeveloped before 1918, the BNL site has experienced numerous ground-disturbing and building demolition events since its initial development by the U.S. Army in 1917 as Camp Upton.

Pre-Camp Upton. Prior to the establishment of Camp Upton, the land was used as a source of wood for the local cordwood industry. A small section, located in the southeast part of the property, was also farmed in the 1800s. The cordwood and farming operations included at least two houses that are now archeological sites.

Camp Upton 1917 –1921. The initial construction of Camp Upton required the clearing of approximately 1,400 acres of pine and oak forest. Roads were established and railroad spurs into the site were developed along the south boundary extending into the central portion of the Camp. Additional excavation actions included establishing water supply and wastewater conveyance piping, a sewage treatment plant, a landfill, target shooting ranges, several areas of warfare training trenches, and a network of ditches to drain the wetland areas as a means of mosquito control. More than 1,700 buildings were constructed as part of the Army camp (see Attachment 1 – 1917 Map of WW I Camp Upton). Following the government's decision to abandon the camp, all of the transportable items, including lumber from buildings, planks that lined the training trenches, and (in some cases) entire buildings, were sold at auction in 1921 and removed from the site (Army 1921). Attachment 2 provides a map of land purchase and lease information from 1917. After the 1921 auction, the land was vacant until the advent of the Civilian Conservation Corps.

Civilian Conservation Corps (CCC) 1934 – 1939. Although few details of CCC activities are known at this time, it is understood that their projects involved constructing two separate groupings of buildings, foresting many areas on site by planting eastern white pines, food plots for wildlife, and establishing fire breaks, most of which remain today. The following aerial photographs and map provide information on the CCC's impact on the BNL site.

- CRMP Reference Document #1 – Site Aerial Photograph Post WW I Pre-Fire Breaks (circa 1932)
- CRMP Reference Document #2 – Site Aerial Photograph Showing Fire Breaks (circa 1938)
- CRMP Reference Document #7 – CCC Plantings Map of Camp Upton Site (1934)

Note: The reference documents identified above are not included within this Plan but are available through the Cultural Resource Management program.

Camp Upton 1940–1946. Reestablishing Camp Upton for WW II likely involved clearing many of the CCC tree plantings. Construction for the developed portion of the camp would likely have destroyed ground-based feature remnants from the main WW I camp area. However, because the WW II camp served as an induction and rehabilitation center, the footprint of development was somewhat less than during WW I Camp Upton. Some foundations and other evidence of WW I Camp Upton, therefore, have remained. Along with building and road construction activities, excavation actions undertaken during the WW II period included trenching for water and sewer piping and establishing a landfill (see Reference Attachment 3 – 1944 WW II Camp Upton Map).

BNL 1947–present. Brookhaven National Laboratory has utilized many of the original WW II Camp Upton buildings and other facilities, including roads, railroad lines, firebreaks, and landfills. Several buildings were relocated and/or joined together to form larger structures. While many WW II-era structures have been replaced as part of ongoing development at BNL, many original camp buildings are still in use today. Major ground disturbing actions have included construction of the major science and support facilities described in Section 3.1.2, and associated utility (water, electric, communications, etc.) infrastructure. Additional actions include the development of an additional landfill (all landfills have been closed and capped), and environmental remediation activities such as access ways, well drilling, and soil removal. Although some Camp Upton artifacts have been recovered during excavation activities, the highly developed areas of BNL are unlikely to yield any substantial below-ground cultural resources.

Special Designations. The BNL site was designated as a Historic Site by the American Physical Society (APS) on September 23, 2011. This designation follows the designation of both the Brookhaven Graphite Research Reactor and the High Flux Beam Reactor as historic landmarks by the APS of which both have been determined eligible for listing on the National Register of Historic Places. On October 19, 2013, the American Chemical Society (ACS) designated the Chemistry Building (Bldg. 555) as a Historic Chemical Landmark for the significant role it played in the development of chemical tracers used to image the brain and diagnose cancer.

Construction of the Proton-Proton Storage Accelerator Facility (ISABELLE). The construction of ISABELLE in 1979 (now the site of the RHIC) destroyed some WW I Camp Upton trenches and features that had been determined to be eligible for inclusion in the National Register of Historic Places.

Recent Construction. Construction projects including the Research Support Building (RSB), NSLS-II, ISB, the Long Island Solar Farm (LISF), and planned development of Discovery Park and the Science User's Support Center have required archeological surveys and/or demolition of older WW-II era buildings and early Lab structures. Removal of structures greater than 50 years of age had mitigation packages prepared under Section 106 of the National Historic Preservation Act and may have also required the development of Memoranda of Agreement (MOA) with the NYSHPO for mitigation actions.

Figure 3.1-2 Major BNL Science Facilities

1. Relativistic Heavy Ion Collider (RHIC) RHIC is one of the world's largest and most powerful accelerators. RHIC's main physics mission is to study particles smaller than atoms.

2. **NASA Space Radiation Laboratory** (NSRL) The NSRL uses heavy ions to simulate space radiation to study the effects on biological specimens such as cells, tissue, and DNA, as well as industrial materials.

3. Alternating Gradient Synchrotron (AGS) The AGS is used for high-energy physics research. It accelerates protons to energies up to 30 GeV, and heavy-ion beams to 15 GeV.

4. AGS Booster The AGS Booster is a circular accelerator, 200 meters in circumference, that receives either a proton beam from the Linac, or heavy ions from the Tandem Ban de Graaff. The AGS Booster accelerates proton particles and heavy ions before injecting them into the AGS ring. This facility became operational in 1992.

5. Linear Accelerator (LINAC) and Brookhaven Linac Isotope Producer (BLIP) The Linac provides beams of polarized protons for the AGS and for the RHIC. BLIP utilizes the excess beam capacity of the Linac to produce radioisotopes used in research and medical imaging. It is one of the key production facilities in the nation for radioisotopes, which are crucial to clinical nuclear medicine. It also supports research on new diagnostic and therapeutic radiopharmaceuticals.

6. Tandem to Booster (TTB) The TTB connects the Tandem Van de Graaff and the AGS Booster. This interconnection permits ions of intermediate mass to be injected into the AGS, where they can be accelerated to an energy of 15 GeV. These ions then are extracted and sent to the AGS experimental area for physics research.

7. Interdisciplinary Science Building (ISB) The ISB fosters energy research, focusing on the effective uses of renewable energy through improved conversion, transmission, and storage.

8. Center for Functional Nanomaterials (CFN) The CFN provides state-of-the-art capabilities for the fabrication and study of nanoscale materials, with an emphasis on atomic-level tailoring to achieve desired properties and functions. CFN is a science-based user facility, simultaneously developing strong scientific programs while offering broad access to its capabilities and collaboration through an active user program. The overarching scientific theme of the CFN is the development and understanding of nanoscale materials that address the Nations' challenges in energy security, consistent with the Department of Energy mission.

9. National Synchrotron Light Source-II (NSLS-II) The NSLS-II generates intense beams of x-ray, ultraviolet, and infrared light and offers an array of sophisticated imaging techniques to capture atomic-level "pictures" of a wide variety of materials, from biological molecules to semi-conductor devices.

10. Computational Science Initiative (CSI) The CSI takes a multidisciplinary, collaborative approach to its research, targeting challenges in cooperation with fellow researchers in science, national security, and industry, both at home and abroad.

11. Tandem Van de Graaff and Cyclotron These two facilities are used in medium-energy physics investigations and for producing special nuclides. The heavy ions from the Tandem Van de Graaf also can be injected into the AGS Booster for physics experiments.

12. Accelerator Test Facility (ATF) The ATF serves to develop and test new designs for the improvement of accelerators for use in facilities both locally and abroad.

13. Medical Isotope Research Laboratory (MIRP) The MIRP is important in the development of new radiopharmaceuticals as well as the isolation of radiopharmaceuticals currently in production.

3.1.3.2 Information Management Tools. The following systems/tools are used to document and track land use activities.

Geographic Information System (GIS). The Environmental Protection Division (EPD) maintains a GIS that includes geospatial information about BNL and its environmental surveillance, compliance, and remediation efforts. Historic maps, images, and Global positioning system (GPS) locations of culturally significant areas are included and maintained as a part of the system. These layers are provided as hard copy maps and on an intranet website to assist personnel in maintenance and construction activities. The internal site may be found at: https://luic.bnl.gov/Default.aspx.

Historical Site Review Report (1993). After the site was added to the National Priorities list under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) a review of past operations and facilities was conducted. This report describes records (drawings, photos, files, interviews) that were reviewed to identify areas with the potential to become areas of environmental concern. Tables identifying historical ground disturbances are provided, along with their locations on BNL site grid maps.

Integrated Facilities Management Job Database. The Facilities and Operations Directorate maintains a database of all their work activities by building number and job number.

Facilities and Operations Management Vault Index. The Facilities and Operations Directorate maintains an electronic index of more than 15,000 facility engineering drawings organized by building number, job number, title, and date. The types of drawings included in the index are plot plans, site plans, floor plans, and Utilities, Details and General Construction plans.

Camp Upton Drawings (microfilm and hardcopy). The Facilities and Operations Directorate maintains an inventory of more than 200 microfilmed and hardcopy drawings from WW II Camp Upton, many of the drawings are incorporated within the F&O Vault Index.

Integrated Facilities Management Active Drawings. The types of drawings include plot plans, site plans, floor plans, and Utilities, Details, and General Construction plans. These drawings are stored electronically (AutoCAD) and are available in categorical layers (examples: individual mechanical utilities, buildings, roadways, etc.).

Miscellaneous drawings, maps, photos. The following items are also useful in identifying past and current land use actions:

- BNL Vegetation Map (Attachment #4). This map is based on examination of a spring 2001 aerial photograph and follows the National Vegetation Standard. Produced for BNL, the map is color coded to indicate the various types of vegetation currently found around the BNL site and is especially useful for identifying areas containing white pines. The map also indicates land uses such as buildings, parking lots, roads, disturbed areas, and grass.
- BNL Site Map Building and Roads (Attachment #5). This map identifies all existing buildings, structures, and roads and is updated periodically to add new buildings and remove demolished structures. Removed buildings are maintained as a separate "hidden" layer within the electronic file.
- World War I Camp Upton Map Overlaying Current BNL Site Map (CRMP Ref. Doc. #3). The WW I map was geo-referenced to create an electronic map layer. The WW I layer was electronically superimposed over the current BNL site buildings and roads map. The extent of the WW I Camp footprint can be easily compared with specific locations.
- World War II Camp Upton Map Overlaying Current BNL Site Map (CRMP Ref. Doc. #4). The WW II camp map was geo-referenced to create a separate electronic map layer. The WW II layer was electronically superimposed over the current BNL site buildings and roads map. The extent of the WW II Camp footprint can be easily compared with specific locations.
- WW I Camp Upton Map Overlaying 2001 Aerial Photo of BNL Site (CRMP Ref. Doc. #5).
- WW I Camp Upton Map Overlaying 1934 Aerial Photo of BNL Site (CRMP Ref. Doc. #6)

- Civilian Conservation Corp Plantings Map of Camp Upton Site (1934) – (CRMP Ref. Doc. #7)

3.1.3.3 Planned Ground-Disturbing Activities. The following documents and tools describe BNL's planned ground-disturbing activities.

Land Use Plan 2022. The Land Use Plan was last updated in 2022 and provides a template for near (5-year) and long-term (10- and 20-year) decisions needed to address site and facilities issues. The Land Use Plan (available at: http://intranet.bnl.gov/mp/webfiles/LandUsePlan.pdf) includes proposed land uses on a broad scale, as well as plans for specific facilities. Figure 3.1-3, Sustainable Development Priority Areas Proposed Land Use (obtained from the Land Use Plan), identifies future development for the BNL site.

Site Implementation Plan 2024. BNL periodically develops or updates its strategic planning documents to reflect a future vision. The current iteration of this is the Site Implementation Plan 2024 that incorporates the Electron-Ion Collider replacing RHIC; the development of Discovery Park; build out of NSLS-II beamlines; Computational Science Initiative; revitalization of several buildings; and demolition of obsolete structures to reduce the footprint. This document is available at the following website address: https://intranet.bnl.gov/mp/im/documents/Site_Implementation_Plan_2024.pdf

Infrastructure Management. Infrastructure Management identifies and prioritizes projects and programs that BNL would like to accomplish. The Major Projects Office implements projects identified on the Current Unfunded Requirements List (CURL) which is available on the MPO web page. Shaded sections of the CURL table indicate those projects that are currently funded. The CR staff receives copies of the following documents that identify funded projects for the current year. These documents will remain available for reference. Examples of FY Project Funding Tables and Documents:

- FY GPP-IGPP Construction Program Funding Authorization Sheet
- FY Operating Funded (Special Maintenance) Program Funding Authorization Sheet
- ES&H Commitment Affirmation Letter (Dir. Office to DOE-BHSO)

NEPA Database. The NEPA Coordinator maintains a Microsoft Access database of all projects submitted for NEPA (National Environmental Policy Act) review. This database presents a list of the most current items planned for near term implementation.

Based on the planning documents identified above and project NEPA reviews performed by the NEPA Coordinator, Attachment 6 summarizes planned ground disturbing activities. This attachment will be revised and replaced each year, with obsolete copies maintained in Cultural Resource Electronic Files.

3.1.3.4 Integration with Natural Resource Management Plan. The BNL Natural Resources Management Plan (NRMP) addresses issues having the potential to affect cultural resources, such as: prescribed fire, fire suppression, and forest thinning (white pines). Therefore, cultural resource considerations must be integrated into the planning of these natural resources management actions. The NRMP is updated on a five-year schedule with the most recent update occurring in 2021.

Goal. Fully integrate knowledge about cultural resources into natural resource planning through the use of GIS and other documentation of the locations of cultural resources.

Actions

- Develop GIS layers for cultural resources. The Natural Resource program will utilize these layers and other pertinent documentation in the planning of natural resource management actions.
- Include planning of pre- and post-cultural resource surveys in prescribed fire areas.
- Include post-event walk-over of wild land fire events.

3.1.4 Summary of Current CRM Program

BNL established a formal Cultural Resource Management program in 1999, under the responsibility of the Environmental Compliance program. Cultural resource management is currently performed by one individual, the Cultural Resource Manager. The Cultural Resource Manager accounts for approximately 0.5 FTEs assigned to cultural resource management. The ideal staffing would be a single full-time position.

The primary function of the CRM program is to identify applicable regulatory requirements, develop appropriate plans and procedures, and integrate these into applicable BNL processes. The program is designed to interact with all aspects of the Laboratory that have the potential to affect cultural resources.

BNL Standards Based Management System procedure "NEPA and Cultural Resource Evaluations" is the primary means of initiating CRM reviews of BNL projects. This procedure describes the protocol requiring formal evaluation of projects for environmental and cultural resource concerns. When a project/proposal is received for review under NEPA, the NEPA Coordinator evaluates the action for potential cultural resource implications. Additional procedures and methods utilized in the CRM program, including the Section 106 Review process, are identified and described in Sections 4.0 and 5.0 of this plan.

In addition to NEPA reviews, cultural resource aspects are also considered when environmental personnel participate in the Form 500A review of Facility and Operations (F&O) projects.

Along with development of the CRMP, recent cultural resource management activities have focused on mitigation activities associated with the decommissioning of two of BNL's research reactors, and evaluation of other on-site buildings and structures identified for demolition in preparation for new construction.

While the Environmental Compliance program is responsible for the BNL Cultural Resource Management program, the CR program overlaps and is complemented by one other BNL function.

BNL Historian. The Director's Office historically sponsored the guest appointment for the BNL Historian, Robert Crease. Robert Crease is a professor in the Philosophy Department at Stony Brook University and performs research/documentation on BNL science and administrative history. Dr. Crease's activities have included conducting "living histories" through audio and video-interviews of individuals significant to the founding of BNL and its science programs, authoring a book on the history of BNL 1946–1972 (Crease 1999), writing numerous articles and presenting lectures related to the science history of the Laboratory. Dr. Crease and Peter Bond recently published a book on 'The Spill' that presents information about the 1997 tritium release from the High Flux Beam Reactor fuel pool.

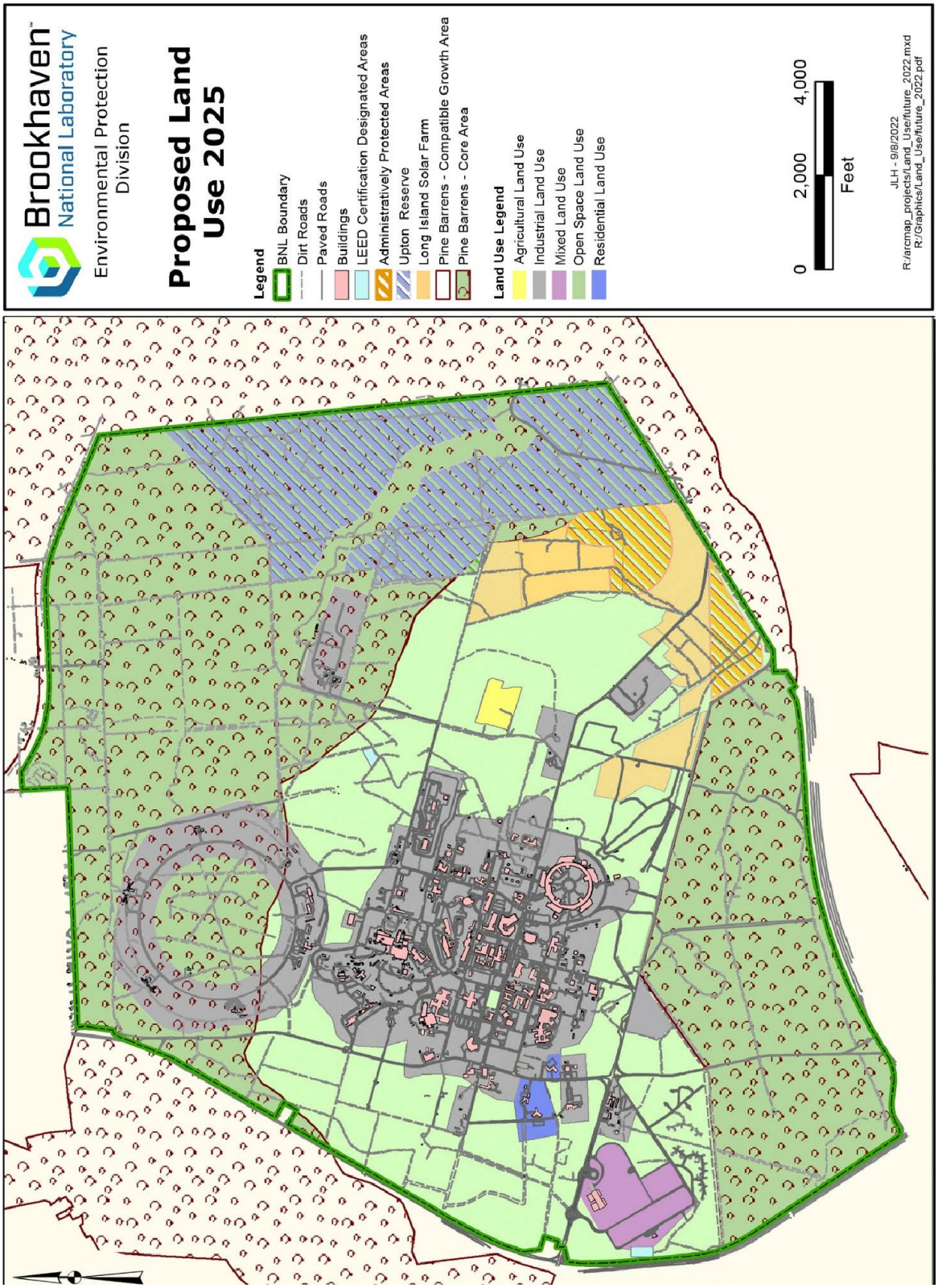

Figure 3.1-3 Proposed Land Use

3.1.5 Funding

The individual responsible for the CR program is funded through the Environmental Planning program budget. The Environmental Planning budget covers the cost of personnel salaries, professional development training/travel, and small operational administrative needs.

Funding for development of the original CRMP was designated through the BNL Activity Data Sheet (ADS) system. Environment, Safety and Health ADS #AAOD0071 was funded, starting in Fiscal Year (FY) 2001. These funds were used to contract external vendors to develop and implement discrete tasks associated with the CRMP. To maintain and meet compliance requirements funding has been provided through the CURL and has allowed the assessment of all buildings, structures, infrastructure over 50 years of age through contracts with appropriately qualified contractors.

Oversight and management of the Camp Upton Historical Collection was transferred over to the CR program in 2010 and is funded through the Environmental Planning budget. All efforts associated with the Camp Upton Historical Collection are completed on an as needed basis.

3.2 CULTURAL AND HISTORIC SETTING

Five distinct periods are associated with the history of the BNL site. Each of these eras is briefly introduced below with greater detail provided in Appendix A.

Pre-Camp Upton (pre-1917). The current site of what is now Brookhaven National Laboratory once consisted of hardwood forests, pine barrens, and wetlands. While there is no evidence of Native American community settlements on BNL property, they may have performed hunting/gathering activities in the area. Early European settlers in the surrounding areas cut hardwood trees on site as part of the local cordwood industry. Two circa-1850s house sites have been identified on BNL property (Reference BNL CR Project # CRP-2004-02 for additional details).

World War I Camp Upton (1917–1921). The federal government acquired 15 square miles of central Long Island woodlands in June 1917 in order to establish a training cantonment. Approximately 1,400 acres were cleared for construction and operation of the main camp area, which ultimately consisted of 1,719 buildings. By October 1917, more than 30,000 soldiers were being trained at Camp Upton. Renowned composer Irving Berlin was stationed at Camp Upton, where he wrote and performed in the musical *Yip, Yip Yaphank*, made famous by the song *Oh How I Hate to Get Up in The Morning*. Berlin's initial draft of *God Bless America* was also composed while he was stationed at Camp Upton. Following the end of WW I, the government ordered the camp to be closed. The camp was completely dismantled and sold at public auction in August 1921. The only remaining evidence of WW I Camp Upton includes foundations, training trenches, and one small brick building.

Civilian Conservation Corps (CCC) (mid 1930s). During the mid-1930s, the CCC stationed four work camps at the Camp Upton site, known then as the Upton National Forest. More than 800 workers were primarily involved with constructing firebreaks and trails, digging water holes to aid in fighting forest fires, and reforestation. The majority of the firebreaks remain today, along with stands of the white pine trees planted by the CCC.

World War II Camp Upton (1940–1946). In 1940, Camp Upton was rebuilt and functioned as an induction center for thousands of WW II recruits. In 1944, the camp was converted to a rehabilitation hospital for wounded soldiers. One section of the property functioned as a prisoner of war compound that housed German POWs. Following WW II, Camp Upton was not dismantled but was transformed into the site of a new government laboratory.

Brookhaven National Laboratory (1947–present). On January 1, 1947, the War Department transferred the Camp Upton property from the Army to the Atomic Energy Commission and Brookhaven National Laboratory, under the management of Associated Universities Incorporated, was officially established to

form a peacetime atomic research facility. The BNL site has steadily evolved over the years, with the development of several major research machines. A few of the buildings and structures from WW II Camp Upton remain in use today.

3.2.1 – 3.2.4 (Covered in Appendix A)

The *Cultural Resources Inventory Including Archival Search, Prehistoric and Historic Period Contexts, and Archeology Sensitivity Assessment of the Brookhaven National Laboratory* was developed in 2001 for BNL by the Institute for Long Island Archeology (ILIA), which was associated with the Department of Anthropology, State University of New York (SUNY) at Stony Brook. This document is presented in its entirety as Appendix A, and represents the following sections of the BNL Cultural Resource Management Plan:

3.2.1 Historic and Prehistoric Natural Environments
3.2.2 Prehistory and History
3.2.3 Traditional Lands and Resource Uses
3.2.4 Treaties, Executive Orders, and Land Grants

3.2.5 Recent Scientific Significance

Brookhaven National Laboratory was established as the Nation's first peacetime (non-weapons) nuclear research facility and was conceived to promote basic research in the physical, chemical, biological, and engineering aspects of the atomic sciences. The concept behind establishing a national laboratory in the northeast was to design, construct, and operate large scientific machines that individual institutions (universities and corporations) could not afford to develop on their own.

3.2.5.1 Research Reactors. The first big machine constructed at BNL was the 10-megawatt Brookhaven Graphite Research Reactor (BGRR). Operating from 1950 to 1968, the BGRR was the first reactor built for civilian research into peaceful uses of the atom. Its sole purpose was to create vast quantities of neutrons, which made it an extremely versatile scientific instrument. Researchers used the BGRR's neutrons as tools for studying atomic nuclei and the structure of solids, and to investigate many physical, chemical, and biological systems. The American Nuclear Society declared the BGRR a Nuclear Historic Landmark in 1988.

The Laboratory's second-generation research reactor, the High Flux Beam Reactor (HFBR) began operations in October 1965. The HFBR operated at power levels of 30, 40, and 60 megawatts until 1996. During 31 years of operation the reactor, which was cooled and moderated by heavy water, provided scientists with beams of neutrons for basic and applied research studies in physics, chemistry, materials sciences, biology, medical, and forefront technologies. Discovery of radioactively contaminated water leaking from the facility's spent fuel storage pool ultimately resulted in its permanent closure in 1999.

In 1958 the Brookhaven Medical Research Reactor began operations specifically for studying medical aspects for the use of radiation. The reactor had facilities to support both animal and human research initiatives. The BMRR was important in the development and refinement of Boron Neutron Capture Therapy for the treatment of brain cancers. The BMRR operated from 1958 to December 2000 when it was closed.

Section 3.3.4 contains additional information on the BGRR, BMRR, and HFBR. Examples of contributions to science and society made possible by research at the BGRR and HFBR are available at the following website: https://www.bnl.gov/about/history/reactors.php

3.2.5.2 Cosmotron. The second "Big Machine" for Brookhaven was the Cosmotron; a 3 billion electron volt (GeV) proton accelerator used in high-energy physics studies. The Cosmotron consisted of 288 C-shaped magnet blocks, each weighing 6 tons, arranged like beads around a 75-foot diameter necklace. After one second of acceleration in the Cosmotron, the protons had traveled 135,000 miles and had reached an energy of about 3 GeV. At that energy, the protons were allowed to strike a target. The fragments of the nuclear collisions were observed using a variety of detectors, including photographs of the telltale trails they left in cloud chambers. These observations proved to be tremendously important for a better understanding of the complex nature of many subatomic particles. The Cosmotron operated from 1952 to1966 and was the first accelerator to achieve 1 GeV (also known as a BeV). It was also the first accelerator to provide an external beam of particles for experimentation outside the accelerator itself. The Cosmotron established BNL as a leader in the physics community and led to the development of the "Strong-Focusing Principle" that would soon become the basis of all large accelerators. After its shutdown, the Cosmotron was completely disassembled. Section 3.3.4 contains information on existing Cosmotron-related assets.

3.2.5.3 Alternating Gradient Synchrotron (AGS). The next generation of particle accelerator took a dramatic step forward, because it could no longer be housed within its own building. The Alternating Gradient Synchrotron (AGS), which came online in July 1960, required construction of a half-mile long trench, with a 260-foot radius. Its main ring is housed in an underground tunnel 18 ft x 18 ft in cross section. At 33 GeV, the particles are accelerated in a vacuum chamber and maintained in orbit by 240 bending-focusing magnets, each 39 x 33 inches in lateral dimensions. The AGS proton beam is used directly in experiments or to produce a variety of secondary beams that supply an array of experimental installations. Until 1968, the AGS was the highest energy accelerator in the world. The AGS is still serving the science community as an accelerator facility and as an injector for the Relativistic Heavy Ion Collider (RHIC).

3.2.5.4 Medical and Biological Research Programs. Medical research at BNL began in 1950 with the opening of one of the first hospitals devoted to nuclear medicine. The Medicine Department was initially housed in Camp Upton's rehabilitation hospital, located in the present-day apartment area. The Life Sciences Program at BNL expanded in the late 1950s with construction of the Brookhaven Medical Research Center in 1958 and the 3-megawatt Brookhaven Medical Research Reactor (BMRR), which operated from 1959 to 2000.

A unique asset of the cultural resource program is the Gamma Forest, the site of a Biology Department research project that operated from 1961 to 1979. The Gamma Forest (Core Facility) was determined eligible for listing on the National Register by Hartgen Archeological Associates, Inc. Refer to Section 3.3.4 for additional information on the Gamma Forest.

3.2.5.5 Additional Facilities (After 1970). Information in this section comes from the BNL website: https://www/bnl.gov/about/history/

Tandem Van de Graaff. The world's largest electrostatic accelerator (at that time), the 30-million eV (3 MeV) Tandem Van de Graaff, became operational in 1970. It supported the continuing work of the Physics Department as they investigated the structure of nuclei and atomic reactions.

The National Synchrotron Light Source. The NSLS operated from 1982 to 2014. Located near the center of the developed portion of the site, the NSLS operated two electron storage rings: an X-Ray Ring and a Vacuum Ultraviolet (VUV) Ring. Both rings provided intense, focused light spanning the electromagnetic spectrum, from the infrared through x-rays. The properties of this light and the experimental stations ("beamlines") allowed scientists to study the properties of matter such as crystal structure, bonding energies of molecules, details of chemical and physical phase transformations, electronic structure, and magnetic properties. The NSLS was instrumental in research resulting in two Nobel Prizes. After operations stopped the electron accelerators and scientific equipment were removed and Building 725 has been repurposed for the Computational Sciences Initiative as a computational center.

The Relativistic Heavy Ion Collider. In designing and building the RHIC, BNL took advantage of the AGS's injection capability and a circular tunnel (15 ft wide by 11 ft high, 2.5 miles in circumference) from an

abandoned project (ISABELLE). The RHIC, which began operations in 2000, drives two intersecting beams of gold ions (and eventually uranium ions) head-on to create subatomic collisions. Designed for scientists to study what may have occurred moments after the universe was created, RHIC's two concentric rings are made up of 1,740 superconducting magnets, strung end-to-end like beads on a necklace. RHIC is powered by over 1,600 miles of superconducting niobium titanium wire, wrapped around the RHIC magnets. The facility contains four beam-intersecting regions, where the experimental halls are positioned. RHIC's two largest detectors, STAR and PHENIX, are larger than typical houses. PHENIX weighs 3,000 tons and STAR weighs 1,200 tons. In 2020, the U.S. Department of Energy awarded the contract for construction of the Electron-Ion Collider (EIC) to BNL and Jefferson Lab. The EIC will utilize one of the hadron accelerators from RHIC and an electron accelerator will be added to the tunnel along with additional support structures.

The Center for Functional Nanomaterials. The Center for Functional Nanomaterials (CFN) at Brookhaven National Laboratory provides state-of-the-art capabilities for the fabrication and study of nanoscale materials, with an emphasis on atomic-level tailoring to achieve desired properties and functions. The CFN is a science-based user facility, simultaneously developing strong scientific programs while offering broad access to its capabilities and collaboration through an active user program. The overarching scientific theme of the CFN is the development and understanding of nanoscale materials that address the Nation's challenges in energy security, consistent with the Department of Energy mission.

The National Synchrotron Light Source II. NSLS-II will be a new state-of-the-art, medium-energy electron storage ring (3 billion electron-volts) designed to deliver world-leading intensity and brightness and will produce x-rays more than 10,000 times brighter than the current NSLS. The superlative character and combination of capabilities will have broad impact on a wide range of disciplines and scientific initiatives, including the National Institutes of Health's structural genomics initiative, DOE's Genomics: GTL initiative, and the federal nanoscience initiative. NSLS-II is expected to become operational in 2014 replacing the current Light Source facility.

The Integrated Science Building I. The Interdisciplinary Science Building will focus on energy-related R&D enabling breakthroughs in the effective uses of renewable energy through improved conversion, transmission and storage. As materials are the linchpin to energy technologies, the ISB will consolidate BNL's efforts in the synthesis and detailed characterization of bulk-, thin film-, and nanomaterials and in device fabrication, which are supported by an outstanding and complete set of complementary tools, i.e., the Center for Functional Nanomaterials (CFN), the National Synchrotron Light Source (NSLS), the New York Blue supercomputer, and in the future NSLS-II. ISB-I is expected to begin operations in 2013.

The Long Island Solar Farm and Solar Research Array. The Long Island Solar Farm (LISF) is a 32-megawatt solar photovoltaic power plant built through a collaboration including BP Solar, the Long Island Power Authority (LIPA), and the Department of Energy. The LISF, located on the Brookhaven National Laboratory site, began delivering power to the LIPA grid in November 2011, and is currently the largest solar photovoltaic power plant in the Eastern United States. It is generating enough renewable energy to power approximately 4,500 homes and is helping New York State meet its clean energy and carbon reduction goals. As part of the development of the LISF, BP Solar agreed to develop a smaller Solar Research Array which is being designated as the Northeast Solar Energy Research Center that will study new photovoltaic technologies and field test solar equipment under northeast conditions,

3.2.5.6 Nobel Prizes. Seven Nobel Prizes have been awarded to individuals whose work was closely associated with BNL. Over a period of 35 years, particle physics studies performed at the Cosmotron and AGS facilities have resulted in four Nobel Prizes in Physics. In 2002, a retired BNL chemist received the Nobel Prize in physics for his accomplishment in the study of neutrinos. In 2003, a visiting scientist shared the Nobel Prize in Chemistry for explaining how a class of proteins helps to generate nerve impulses. In 2009, two individuals associated with Brookhaven's National Synchrotron Light Source shared the prize for studying the structure and function of the ribosome.

Parity violation, 1957. In 1957, two scientists who had worked as guest scientists at Brookhaven during the summer of 1956 received the Nobel Prize in physics for radically questioning one of physics' basic tenets. T. D. Lee, of Columbia University, and C. N. Yang, then of BNL, interpreted results of particle decay experiments at Brookhaven's Cosmotron particle accelerator and discovered that the fundamental and supposedly absolute law of parity conservation had been violated.

Their studies concerned two particles, the tau and the theta, which had the same masses, lifetimes, and scattering behaviors, but which decayed differently in experiments at the Cosmotron. Because of this, the law of parity conservation required that these otherwise similar particles be considered different from one another. Lee and Yang suggested experiments that showed that the weak interaction of radioactive decay could indeed violate parity conservation. When the experiments were later successfully completed, the puzzle of the two particles was solved—they *could* be the same.

The J/psi particle, 1976. The 1976 Nobel Prize in physics was shared by a Massachusetts Institute of Technology researcher who used Brookhaven's Alternating Gradient Synchrotron (AGS) to discover a new particle and confirm the existence of the charmed quark. Samuel C.C. Ting was credited for finding what he called the "J" particle, the same particle as the "psi" found at nearly the same time at the Stanford Linear Accelerator Center by a group led by Burton Richter. The particle is now known as the J/psi. Ting's experiment at the AGS took advantage of high-intensity proton beams, which bombarded a stationary target to produce showers of particles that could be detected by complex detectors. A strong peak in electron and positron production at an energy of 3.1 GeV led Ting to suspect the presence of a new particle, the same one found by Richter. Their discoveries not only won the Nobel Prize; they also helped confirm the existence of the charmed quark—the J/psi is composed of a charmed quark bound to its antiquark.

CP violation, 1980. Just four years after Ting and Richter received their prize, the 1980 Nobel Prize in physics was awarded to two researchers whose discovery at Brookhaven's AGS was the opposite of what they had expected to find when they began their experiment in 1963. James W. Cronin and Val L. Fitch, both then of Princeton University, proposed using Brookhaven's AGS to verify a fundamental tenet of physics known as CP symmetry, by showing that two different particles did not decay into the same products. They picked as their example neutral K mesons, which are routinely produced in collisions between a proton beam and a stationary metal target.

The experiment set out to show that in millions of collisions, the short-lived variety of K meson always decayed into two pi mesons, while the long-lived variety never did. But to their surprise, a "suspicious-looking hump" in the data showed an unexpected result that years of subsequent experimentation and theory have been unable to explain: occasionally, the long-lived neutral K meson does decay into two pi mesons. Cronin and Fitch had found an example of CP violation. The discovery's ramifications stretched far beyond the neutral K mesons; Cronin and Fitch had discovered a flaw in physicists' central belief that the universe is symmetrical.

Discovery of the muon-neutrino, 1988. BNL's next Nobel Prize came in 1988, when a trio of physics researchers were honored for their 1962 discovery of the muon-neutrino. Leon Lederman, Melvin Schwartz, and Jack Steinberger, at the time all of Columbia University, made their discovery at the brand-new AGS. At that time, only the electron-neutrino was known, and the scientists wondered if they could find more types of these ghostlike particles that pass through everything. The AGS, then the most powerful accelerator in the world, was capable of producing the beam needed.

The experiment used a beam of the AGS's energetic protons to produce a shower of pi mesons, which traveled 70 feet toward a 5,000-ton steel wall made of old battleship plates. On the way, the pi mesons decayed into muons and neutrinos, but only the latter particles could pass through the wall into a neon-filled detector called a spark chamber. There, the impact of neutrinos on aluminum plates produced muon spark trails that could be detected and photographed—proving the existence of muon-neutrinos. The experiment's use of the first-ever neutrino beam paved the way for scientists to use these particles in research at the AGS and around the world.

Detection of cosmic neutrinos, 2002. In 2002, Raymond Davis, Jr. was awarded the Nobel Prize for first detecting solar neutrinos, ghostlike particles produced in nuclear fusion reactions occurring in the core of the sun. Davis devised a method to detect solar neutrinos based on the theory that the elusive particles produce radioactive argon when they interact with a chlorine nucleus. He constructed his first solar neutrino detector in 1961, 2,300 feet below ground in a limestone mine in Ohio. Building on this experience, he mounted a full-scale experiment 4,800 feet underground in the Homestake Gold Mine in South Dakota. In research that spanned from 1967 to 1985, Davis consistently found only one-third of the neutrinos that standard theories predicted. His results threw the field of astrophysics into an uproar, and for nearly three decades physicists tried to resolve the so-called "solar neutrino puzzle." Davis's lower-than-expected neutrino detection rate is now accepted by the international science community as evidence that neutrinos have the ability to change from one of the three known neutrino forms into another. This characteristic, called *neutrino oscillation*, implies that the neutrino has mass, a property that is not included in the current standard model of elementary particles (in contrast, particles of light, called photons, have zero mass). Davis's detector was sensitive to only one form of the neutrino, so he observed less than the expected number of solar neutrinos.

Class of proteins that helps to generate nerve impulses, 2003. In 2003, Roderick MacKinnon, M.D., a visiting researcher at BNL's National Synchrotron Light Source, was one of two recipients of the Nobel Prize in Chemistry for work explaining how a class of proteins helps to generate nerve impulses—the electrical activity that underlies all movement, sensation, and perhaps even thought. The work leading to the prize was done partly at BNL's NSLS and partly at the Cornell High Energy Synchrotron Source.

Structure and Function of the Ribosome, 2009. In 2009 Venkatraman Ramakrishnan, of the Medical Research Council Laboratory of Molecular Biology in Cambridge, UK, a former employee in Brookhaven's biology department, and long-time user of the NSLS, and Thomas A Steitz of Yale University, also a long-time user of the NSLS shared the Nobel Prize with Ada E. Yonath of the Weizmann Institute of Science for studying the structure and function of the ribosome responsible for producing proteins within living cells.

3.2.5.7 Additional Discoveries. Other significant scientific discoveries made at BNL include those listed below, with additional information available at the BNL website http://www.bnl.gov/bnlweb/history/.

- L-dopa, used to treat Parkinson's disease
- Magnetically levitated (maglev) trains
- Pioneering work using X-rays and neutrons to study biological specimens, leading to the modern science of structural biology
- The radionuclide thallium-201, now used in millions of heart stress-tests each year
- The radionuclide technetium-99m, now used to diagnose heart disease and other ailments in more than 11 million Americans each year
- X-ray angiography for non-invasive heart imaging
- The strong focusing principle, crucial to the function of all modern particle accelerators
- The first video game

3.3 KNOWN CULTURAL RESOURCES

This section presents the identified cultural resources associated with BNL, grouped into the following main categories: Prehistoric, Historic, Ethnic, and Scientifically Significant. Attachment 7 presents a tabular listing of each known cultural resource and will be updated as new resources are identified. The table includes the following information for each identified resource:

- *BNL CR ID #.* A number assigned to uniquely identify each cultural resource
- *Type*. Resources are identified as properties (buildings, structures, sites, districts), objects, or "other."
- *Period*. Prehistoric, Historic, Ethnic, and Scientifically Significant
- *Name*. Common name assigned to the resource

- *Description*. Short description of the resource
- *NRHP*. Identifies the resource's National Register status as either: U- undetermined; Y- Determined to be NRHP eligible; L - Listed on the NRHP; N – Determined not to be NRHP eligible.

Included with traditional cultural resources (buildings, sites, etc.) are items that may be considered more as supporting assets. These items are identified in order to acknowledge their contribution and vital role in the CRM program and to ensure they are managed in the appropriate manner. In some cases, a single listing in the table may represent a group of items; for example, the Camp Upton Historical Collection. Such a group may include many items that are identified individually in a separate database or inventory. In these situations, the associated inventory or database is identified in the Attachment 7 table.

3.3.1 Prehistoric Cultural Resources

Resources in this category pertain to the period of time before the advent of written history, generally, prior to the arrival of Europeans to the region. According to the Institute for Long Island Archeology, "areas of the BNL property within or adjacent to wetlands and other fresh water sources have a high sensitivity for the presence of prehistoric deposits. Until recently no prehistoric cultural resources had been identified at BNL. In October 2012 a single worked quartz flake was found in the vicinity of wetlands on the eastern boundary of BNL. The item was transferred to the Institute for Long Island Archeology for documentation and curation.

Sections of BNL property not adjacent to freshwater resources have a low to moderate potential for prehistoric archeological sites. Areas thoroughly disturbed by twentieth century land use activities have a very low sensitivity for the presence of intact archeological deposits." Refer to the Archeology Sensitivity section of Appendix A for additional details.

3.3.2 Historic Cultural Resources

Resources in this category pertain to the period after the advent of written history, generally following the arrival of Europeans to the region. While the majority of these resources are associated with the twentieth century developed site, specifically World War I Camp Upton through World War II Camp Upton and first thirty years of BNL, a few resources related to pre-twentieth century land use are identified. Refer to the Archeology Sensitivity section of Appendix A for additional details. Attachment 8 identifies the location of cultural resource areas, sites, and buildings, including sensitive cultural resource areas, primarily the WW I trenches and foundations. (**Note**: This map is considered Sensitive Information – Limited Distribution Only). Brief descriptions of these historic resources are provided below.

(Weeks Campbell Site) (BNL-CR-1). The site of a house/farm, whose main period of occupation was the late nineteenth-early twentieth century, has been identified on BNL property (Merwin, Manfra 2005). An archeological site evaluation of this property was performed in 2004 (Reference CR Project #CRP-2004-02). This site may be National Register eligible. Figures 3.3-1 and 3.3-2 present photos of the stone wall/foundation and brickwork identified at the site.

Wheel and Hub (BNL-CR-02). A steel rim and hub, likely from a wagon or carriage-type of vehicle, were found on site.

W. J. Weeks Site (BNL-CR-32). The site of a house whose main period of occupation was the mid- to late nineteenth century was identified on BNL property. An archeological site evaluation of the house site was performed in 2004 (Reference CR Project #CRP-2004-03). Potential research topics associated with this site may include lifeways of otherwise "undocumented" people, (i.e. tenant woodchoppers); socio-economic issues of non-landholding lower class in nineteenth century rural setting (Merwin, Manfra 2005). This site is National Register eligible but has not been formally submitted to SHPO for official determination. Figures 3.3-3 and 3.3-4 present photos of the locust fence post and stone foundation wall.

Figure 3.3-1 Stone Foundation Wall, Weeks Campbell Site

Figure 3.3-2 Brickwork , Weeks Campbell Site

Figure 3.3-3 Locust Fence Post, W.J. Weeks House Site

Figure 3.3-4 Foundation Stones, W.J. Weeks House Site

World War I Training Trenches (BNL-CR-4). Within the BNL property, ten (an eleventh site was located based off review of lidar data) separate areas of trench warfare training trenches dating back to World War I Camp Upton have been identified (Merwin and Lam 2002). Each of the ten trench areas varies in the degree of complexity; one area may encompass a single trench, while other areas may include a network of interconnecting trenches. These features are likely the only surviving WW I trenches in the United States. Their presence and high degree of preservation may provide opportunities for documenting construction techniques and training methods, which is significant for both American and international military engineering and history. The BNL training trenches were determined to be eligible for listing on the National Register of Historic Places in 1979. Each trench was surveyed and mapped as part of CR Project # CRP-2002-02, thus providing an overview of the complexity of each network. Figure 3.3-5 shows the result of mapping the most intricate network of the BNL trenches. Figure 3.3-6 is a photo of one of the trenches as it appears today.

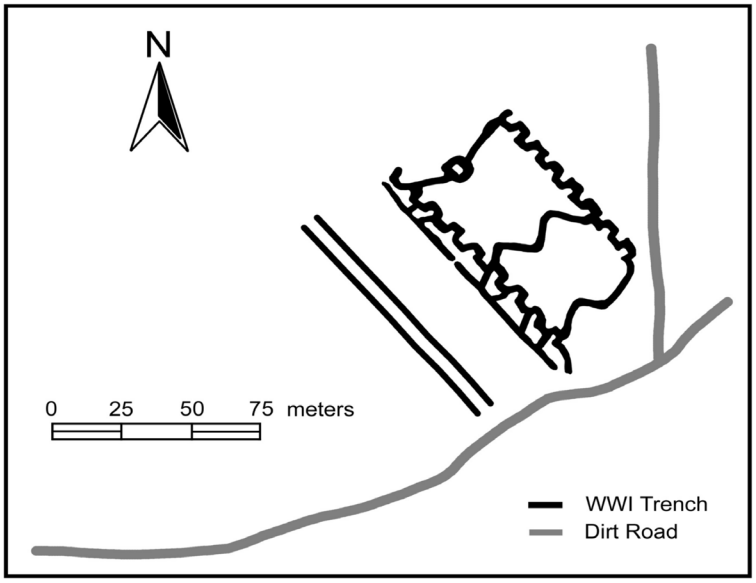

Figure 3.3-5 Diagram of Mapped Trench Network

Figure 3.3-6 Extant WW I Training Trench

World War I Foundations and Features (BNL-CR-5). In addition to the trenches, remnants of WW I Camp Upton are also present on site in the form of building foundations and structural features such as concrete railroad loading platforms, brick buildings, dry wells, and sewers. Two areas contain concentrations of the majority of the foundations, although additional foundations have been identified in outlying areas of the site. Surveying and mapping these areas, as part of CR Project No. CRP-2002-02, revealed that the foundations do conform to building locations identified on maps of WW I Camp Upton (Reference Attachment 1: Map of WW I Camp Upton).

Camp Upton Historical Collection (BNL-CR-3). The collection contains more than 2,000 items related to the U.S. Army's occupation of the property as Camp Upton during both World War I and II, including both donated articles and those recovered on site. Examples of collection items include uniforms, metals,

weaponry, original camp newspapers and original period newspapers, and 77th Division, and "Lost Battalion" items. In addition to military items, the collection houses memorabilia related to the famous composer Irving Berlin and his days at Camp Upton. Refer to Section 3.4.9, Outreach, for additional information on the collection.

Grain Silo Bases (BNL-CR-6). These structures no longer exist and were documented in a Section 106 package allowing their demolition prior to the construction of the NSLS-II facility.

Building 455 (BNL-CR-7). This small brick building is one of the few extant structures remaining from WW I Camp Upton. The building has been modified with new framing and roofing and is currently used for storage. The building was determined not to be eligible for listing due to significant modifications.

White Pine Trees (BNL-CR-8). Several stands of white pines can be found throughout the BNL site. These trees were planted by the Civilian Conservation Corps (CCC) in the 1930s as part a reforestation project that followed the closing and dismantling of Camp Upton after the end of World War I. The white pines have been determined not eligible for listing due to not being connected to important structural features.

Building 30 (BNL-CR-9). The center section of Building 30 was constructed in 1934 when the CCC occupied the site. As part of WW II Camp Upton, the building served as an officers' club. The building has been evaluated and determined not to be eligible due to significant modifications since construction.

Building 120 (BNL-CR-10). Building 120 is the only two-story barracks building remaining from WW II Camp Upton which has not had its exterior significantly renovated. The building was moved from its original location in the late 1940s and the interior has been modified to accommodate offices. Building 120 has been determined to be eligible for inclusion on the National Register.

WW II Mural (BNL-CR-23). A small portion of a mural painted on the wall of what was once the WW II non-commissioned officers' club is visible above the ceiling level in Building 197. The mural depicts a map of WW II Camp Upton. While the mural once encompassed the entire wall of the building, most of the mural appears to have been destroyed by renovations over time. Building 197 is not eligible for listing and is being demolished section by section.

BNL Photo Negative and Video Archives (BNL-CR-21). Photographic negatives from the inception of BNL in 1947 to the present day are stored on site. These archives document the facilities, personnel, and science that have taken place at BNL. A bound index listing each negative is available. As needed, negatives are scanned to digital format. BNL videos were catalogued, and key videos of historic significance were digitized in 2021. The catalog is an excel spreadsheet that is available for review upon request.

BNL Bulletin and Press Release Archives (BNL-CR-22). Archives of BNL press releases and newsletters (*The Brookhaven Bulletin* and *Isotopics*) are stored on site. These archives document the scientific, occupational, and social activities at BNL through the years. Beginning in December 2012 the weekly *BNL Bulletin* will become an electronic newsletter called "*Brookhaven This* Week" and will no longer be published in hard copy. A new "*Brookhaven Digest*" will be a full-color printed publication that will be addressed to approximately 400 employees and subscribers without regular access to BNL computers.

Actions

- Determine long-term storage needs for BNL press release and newsletter archives.

3.3.3 Resources of Ethnic Importance

Resources in this category include those of religious value or other cultural significance to Native Americans or other ethnic groups.

To date, resources of ethnic importance, such as sacred sites, traditional-use resources, and Native American cultural items, have not been identified on the BNL site. If such items are identified in the future, appropriate consultation with Native American tribes and the NYSHPO will be initiated. Refer to the Archeology Sensitivity section of Appendix A for additional details.

3.3.4 Resources of Scientific Significance

Resources in this category may include buildings, structures, objects, programs, or properties associated with scientific, engineering, or technical themes of historic significance.

Cultural resources of scientific significance that are identified in Attachment 7 include buildings, sites, and scientific equipment artifacts, as well as supporting assets such as scale models of facilities. Resources that can potentially help to document BNL's scientifically significant activities, such as photograph negative archives, film and video archives, and public relations files, also are included. Brief descriptions of some of the scientifically significant resources are provided below.

Brookhaven Graphite Research Reactor (BGRR) Complex (BNL-CR-11), model (BNL-CR-20), archives (BNL-CR-24), and History Video (BNL-CR-25). The BGRR is considered a "core" facility—a building that uniquely characterizes BNL's scientific significance as well as its reason for existence. In addition to the Reactor Building (Building 701) and Reactor Pile (Bldg. 702), the BGRR complex encompasses buildings that were constructed to support the BGRR or that were directly supported by it. Included in this category are the Reactor Laboratory (Bldg. 703), the Fan House (Bldg. 704), the Pile Stack (Bldg. 705), the Instrument House (Bldg. 708), the Canal House (Bldg. 709), the Water Treatment Facility (Bldg. 709A), and the Hot Laboratory (Bldg. 801). The near-term decontamination and decommissioning (D&D) has been completed for this complex with the removal of the Reactor Pile, Fan House, Canal House, Water Treatment Facility, Instrument House, and the Stack. The BGRR Complex was determined to be eligible for listing on the National Register of Historic Places in 2000 (Desmarais 2000). Additional information on the BGRR is available at the following website:

https://www.bnl.gov/about/history

A scale model of the BGRR exists and is currently in storage in building 703 and is under control of the Cultural Resource program. The scale model was most recently used for D&D planning and implementation at the facility. Documents related to the design, construction, operations, and maintenance of the facility have been professionally inventoried and archived. A Microsoft Excel database of all records was developed and key-word descriptors were established. A list of records and photographs contained in the BGRR files was also produced. A video history of the BGRR was produced and distributed in September 2003. The video presents the BGRR through the recollections of key individuals, who contributed to its success as a premier research tool throughout its 18-year operating history, (1950–1968). BNL Historian Robert Crease narrates the design, construction, operation, scientific research, and shutdown of America's first nuclear reactor designed for peacetime civilian applications. The video is available upon request.

High Flux Beam Reactor (HFBR) Complex (BNL-CR-12) and scale models (BNL-CR-17, 18, and 19). The HFBR, which operated from 1965 to 1996 (permanently shut down in December 1999), was one of the first research reactors designed to be optimized for a specific function—neutron beam experimentation. Its breakthrough design allowed the population of neutrons to peak at the outside edge of the reactor core, thus providing maximum access for scientific experimentation. The basic research conducted at the HFBR provided a better understanding of the mechanisms and processes that make materials, matter, and pharmaceuticals unique and effective. The HFBR complex is comprised of the easily recognizable dome-shaped reactor building (Building 750), the Cold Neutron Compressor Building (Bldg. 751), the Pump House (Buildings 707 and 707A), the Water Treatment House (Bldg. 707B), as well as support buildings shared with the BGRR Complex (Buildings 704, 705 and 802 fan house). The HFBR Complex was determined to be eligible for listing on the National Register of Historic Places in 2001 (Warren 2001). The complex has undergone D&D with removal of the fuel rods, control rod blades and beam plugs and demolition of buildings 707, 707A, and 707B). Additional radioactive equipment and the reactor vessel remain in place. The Reactor Building

(Bldg. 750) is now maintained "cold and dark" allowing the radiological contamination within the remaining equipment and the reactor vessel to decay in place. The final D&D of the facility is expected to occur after 75 years. As mentioned above Bldgs. 704, 705, and 802 were demolished as part of the BGRR D&D process. Additional information on the HFBR is available at the following website:

http://www.bnl.gov/about/history/reactors.php

Three scale models of the HFBR (the HFBR building, its biological shield and vessel, and a mock-up of the fuel element) are available for interpretation and are maintained by the Cultural Resource program.

Gamma Forest Site (BNL-CR-13). From 1961 to 1978, the Biology Department operated the Gamma Forest as a long-term research experiment designed to yield information on the sensitivity of plants to ionizing radiation and other biological interactions. This facility consisted of a fenced, 50-acre forested tract in the northeast area of the site where a large cesium-137 gamma source was exposed for 20 hours each day. The program was discontinued, and the source was removed in 1979. The effects on the study area's ability to regenerate vegetation can still be observed, along with remnants of the program's operational hardware and control shack. The site has been utilized for limited follow-on studies on the long-term impacts of the original irradiations. The Gamma Forest, core facility (roughly 50 acres), has been determined eligible for listing on the National Register of historic places.

Cosmotron Site (BNL-CR-14), C-Magnet (BNL-CR-15), and Models. Refer to Section 3.2.5 for a description of the Cosmotron's scientific significance. All that remains of the facility is a slightly raised circle of concrete on the floor of Building 902, indicating the outline of the Cosmotron ring. However, one of the Cosmotron C-magnets is displayed outside Building 911, and the Smithsonian Institution has one in their historical collection. The scale models of the Cosmotron are under the control of the Cultural Resource program and are stored in Bldg. 703.

Goal. Continue to research the significance of the identified resources and other potentially scientifically significant resources and supporting assets including the following:

Bldg. 830 Hot Cells models
Bldg. 463 Molecular models
Bldg. 490 Deep Sea buoys models (these need to be located after remodeling of 490 west lobby)

Actions

- Develop brief descriptions of additional CR assets listed in Attachment 7.

3.4 CULTURAL RESOURCE MANAGEMENT ACCOMPLISHMENTS

This section of the CRMP addresses past accomplishments in the management of cultural resources at BNL. Included are descriptions of accomplishments for CR records, project reports, inventories, surveys, excavations, structure management, laboratory treatment, curation, protection, and outreach. The Introduction to the CRMP (Section 1.0) explains the history of cultural resource management at BNL and therefore is not repeated here. Until the development of this management plan, BNL did not have standardized systems related to most aspects of cultural resource management, including archeological site records, reports, and so forth. Systems established during development of the CRMP are described in Section 4.2, CRM Methods.

3.4.1 Records, Projects, and Reports

Records. Records related to CRM are filed according to departmental file codes. Past and current file codes related to CRM documents are identified in Section 4.2, CRM Methods.

Projects. CR projects preformed or initiated to date are identified in Attachment 9. The table presents the following information related to each project: Project #, Name, Description, Performed By, and Comments.

Note: Assigning specific CRM project numbers was initiated in October 2002 and only projects performed in or after 1999 have been listed. CRM projects performed to date either utilized existing BNL numbering schemes (such as the BNL building numbers) or have established an identification system unique to the specific project or report.

CR Library. A system for acquiring, storing and accessing originals or copies of reports, documents, and other written materials dealing with BNL cultural resources has not been established to date.

Goal. Develop new, and refine existing, systems for managing CRM documents.

Actions

- Develop a system for acquiring, storing, and accessing originals or copies of reports, documents, and other written materials that concern BNL cultural resources (i.e., develop the CR Library).

3.4.2 Inventory

3.4.2.1 Archival Searches.

BGRR Records. An archival search was performed for the Brookhaven Graphite Research Reactor (BGRR) Records Project (CRP-2000-02). As part of the Memorandum of Agreement between DOE and the NYSHPO on mitigating the decommissioning of the BGRR, BNL contracted with an outside vendor to inventory and appraise records relating to the BGRR design, construction, operations, and maintenance. The records were assigned to series and retention recommendations were made for all items. A Microsoft Excel database of all records was developed, and key-word descriptors were established. A listing of records and photographs contained in the BGRR files was produced. This project was performed from August 11, 2000 to August 31, 2001. Refer to CRP-2000-02 for additional details. Most records and photographs have been archived within the federal repository system, while limited material has been retained by BNL.

W. J. Weeks House Site and Weeks Campbell Site. Archival research was also conducted as part of the archeological evaluations of the two nineteenth century sites. Refer to CRP-2004-02 (Merwin and Manfra 2004) for additional details.

3.4.2.2. Ethnographic Fieldwork. Not anticipated to be necessary at BNL.

3.4.2.3 Structure and Facility Surveys.

Reviews and Surveys. Reviews and surveys for cultural resources are typically conducted through the issuance of contracts for specific services. Several inventories, evaluations, and architectural surveys have been conducted since 1981. NHPA Section 106 reviews are conducted as actions associated with buildings over 50 years of age are planned. Attachment 10 provides a compilation of efforts conducted to date and Attachment 11 provides a map of buildings and structures that have been evaluated with appropriate designations as to eligibility.

3.4.2.4 Structure and Facility Survey Status. The surveys described in Attachment 10 encompass evaluations performed by several different individuals or organizations, considering both historic and recent scientific significance. Information provided by these surveys is being used as the basis to formulate the BNL's approach to cultural resources management. In 2019 BNL contracted with Hartgen Archeological Associates to evaluate multiple buildings to determine if any were eligible for inclusion on the NRHP. The

contract resulted in four reports and the addition of 25 buildings or structures being eligible. The reports were sent to the SHPO for review and the SHPO concurred with the findings.

In 2021 during a routine annual assessment of the Facilities and Infrastructure Management System (FIMS) several buildings, structures, and infrastructure were identified as being older than 50 years and had not had determinations with SHPO concurrence documented within database. Several of the listed facilities had been addressed in the 2001 Architectural Inventory but may need to be re-evaluated.

3.4.2.5 Archeological Surveys. This section identifies archeological surveys performed to date. Attachment 12 identifies the location of these archeological survey areas (**Note**: This map is considered Sensitive Information – Limited Distribution Only):

- 1974 - Archeological Site Survey Report of BNL. Performed by the Incorporated Long Island Chapter of the New York State Archeological Association, Edward Johannemann, Field Director (Johannemann 1974).

Purpose. To ascertain the existence of cultural material indicating a historic, and or prehistoric occupation within the BNL property. This survey did not include the investigation of structures or material relating to World War I and the Post World War I-era.

Area Surveyed. The following five areas were surveyed (see Attachment 12):

Area A – Periphery of the ~5.6-acre Zeek's Pond
Area B – East and west sides of the smaller 2-acre pond ~1,000 ft north of Zeek's Pond
Area C – Streambed of the Peconic River
Area D – Approximately 20 acres, bounded on the south by a line 300 ft north of and parallel to Fifth Avenue. Bounded on the west by a firebreak parallel to Upton Road, distant 1,600 ft west.
Area E – Half Moon Pond, ~1 acre in size.

Results. All areas tested proved to be devoid of cultural resource materials.

1977 – Cultural Resource Inventory - Part I - BNL ISABELLE Project. Performed by the Long Island Archeological Project, SUNY Stony Brook - Edward J. Johannemann (Johannemann 1977).

Purpose. To determine the presence or absence of prehistoric and/or historic evidence on the proposed work site for the ISABELLE Project.

Area Surveyed. The survey focused on six specific areas within the ~450-acre area impacted by the ISABELLE project (see Attachment 12).
Results. Fourteen specific cultural resource areas were located, mapped, and investigated. These sites consisted primarily of World War I warfare training trenches and depressions. A small amount of WW I-era midden (nails, buttons, wire, etc.) was recovered from two of the areas. No evidence of prehistoric or Native American artifacts was recovered.

1978 - Cultural Resource Inventory - Part II – BNL – ISABELLE Project. Performed by the Long Island Archeological Project, SUNY Stony Brook - Edward J. Johannemann (Johannemann 1978).

Purpose. Focus on surveying three specific areas of the proposed ISABELLE project to determine the presence or absence of prehistoric or historic evidence. The project also included archival research of the World War II-era and additional World War I documentation.

Area Surveyed. The survey focused on three specific areas within the ~450-acre area impacted by the ISABELLE project (see Attachment 12).

Results. Six specific cultural resource sites were located, mapped and investigated. These sites consisted primarily of World War I warfare training trenches and World War II-era encampments. No cultural resource materials were recovered from these areas.

2001 – Islander East Pipeline Project (Non-BNL Sponsored). Performed by Public Archaeology Laboratory, Inc. (PAL) based in Pawtucket, Rhode Island.

Purpose. To conduct an archeological survey in advance of a proposed gas pipeline.

Area Surveyed. PAL excavated 89 shovel test pits (50 x 50 centimeters) along eight transects. The transects ran along the eastern side of William Floyd Parkway at the far western end of the BNL campus (see Attachment 12).

Results. Only two artifacts were reported (an isolated quartz flake and a single piece of historic period ceramic), along with one Camp Upton foundation feature (Public Archaeology Laboratory 2002).

2001 – Eastern Long Island Extension (Non-BNL Sponsored). The DOE issued a Federal Archeological Permit to R. Christopher Goodwin and Associates, Inc.

Purpose. To conduct an archeological survey for the Iroquois Gas Transmission System's proposed pipeline.

Area Surveyed. Surface reconnaissance and shovel testing along a 200-ft-wide corridor where the west side of the BNL property borders the William Floyd Parkway (see Attachment 12).

Results. No prehistoric materials were identified, but four features likely dating to the World War I and World II eras were reported (Maymon et al. 2003).

2003 – Stage 1B Archeological Survey for BNL Railway Extension. Performed by the Institute for Long Island Archeology.

Purpose. A small-scale archeological survey was conducted in advance of construction of a railroad spur (approximately a half-mile long). The area was known to contain concrete features from the WW I Camp Upton era (two building foundations, two square pillars, and four concrete pads).

Area Surveyed. The project area is located in the southeast portion of the Laboratory property. The area surveyed was approximately 100 ft wide and a half-mile long. The process consisted of field inspection and surface survey, followed by excavating a total of 35 shovel test pits.

Results. No prehistoric materials or features were encountered. A small complex of WW I Camp Upton era concrete remnants were identified, along with a light density of cultural material. The study concluded that no further archeological investigations would be necessary in the project area (Bernstein and Merwin 2003).

2004 - Archeological Evaluations of the W.J. Weeks House Site and the Weeks-Campbell Site. Performed by the Institute for Long Island Archeology.

Purpose. Archeological evaluations of two sites were performed to delineate the horizontal and vertical boundaries of cultural deposits, and to obtain information on the structure, function, cultural/historical context, significance, and integrity of each site. This information was used to evaluate the sites' potential eligibility for the National Register of Historic Places and includes recommendations for site protection. The evaluations consisted of archival research and field investigations.

Area Surveyed. Both project areas are located in the southeast portion of the Laboratory property. The W.J. Weeks house site evaluation encompassed ~1 acre, and the Weeks Campbell site evaluation encompassed ~2 acres. Fieldwork entailed surface inspection along with the excavation of shovel test pits to define spatial

boundaries and artifact distribution patterns, and excavation squares (3.3 x 3.3 foot) to assess subsurface integrity and site function and create larger exposures to search for buried features.

Results.
W.J. Weeks House site: The main occupation of the W.J. Weeks House site is mid nineteenth century. The age, density and diversity of artifacts, along with intact subsurface features suggest high research potential. Despite earlier looting/disturbance, the site is National Register eligible. Potential research topics related to this site may include lifeways of otherwise "undocumented" people, in this case, tenant woodchoppers; socio-economic issues of non-land holding lower class in nineteenth century rural setting. (Merwin and Manfra 2005).

Weeks-Campbell site: The main occupation of the Weeks Campbell site is late nineteenth-early twentieth century. The site has a relatively high degree of integrity, with several surface and subsurface features (agricultural landscape markers, the brick walkway, and most importantly, the foundation/cellar hole). The Weeks Campbell site appears to be National Register eligible. Possible research topics may include late nineteenth century rural domestic lifeways of what was likely an agrarian family; also, the site yielded evidence of military occupation, probably World War I era, so might be important as a "satellite" site (even if not used for an official Army function) of Camp Upton. (Merwin and Manfra 2005)

2007 – Stage 1 Archaeological Survey for the Proposed National Synchrotron Light Source II. Performed by the Institute for Long Island Archeology.

Purpose. Archeological evaluations of the area within the disturbance footprint of the proposed NSLS II to document the presence/absence of archeological features in preparation of the Environmental Assessment for the proposed facility.

Area Surveyed. The survey covered approximately 36 acres of the area to the east of the former warehouses including the open fields and forested areas to be disturbed during the construction of the facility. A total of 353 shovel test pits were placed at approximately 49 foot intervals.

Results. No prehistoric period artifacts or features were encountered during the archaeological survey. A light density of early twentieth century Euro-American materials (dominated by nails, coal, and slag, but also window and bottle glass, a few ceramic fragments, a fragment of a small horseshoe, a button, and a 1908 dime) was found in several shovel test pits, mostly in the open ball fields. No features were identified, and no evidence of the World War I and CCC era structures was encountered during subsurface testing. The Euro-American artifacts are probably associated with Camp Upton and/or CCC activities, but due to the light density and low diversity of the materials their research potential is very low. No further archaeological investigations were recommended.

2009 – Archeological and Architectural Data Recover for the Privy Site at Brookhaven National Laboratory.
Performed by the Institute for Long Island Archeology.

Purpose. The proposed Long Island Solar Farm was identified as impacting one or more privies associated with the CCC era and located just north of the area known as the Biology Fields. This project was established to document the construction and historic aspects of the single standing privy and investigate other potential privy sites in the area.

Area Surveyed. Approximately 0.5 acres surveyed, using 10 test pits approximately 2 meters apart. The privy construction was documented, and the privy pit excavated.

Results. Full architectural analysis and documentation of the privy was made, the pit excavated and the area around the privy surveyed for other potential privies. The privy likely originated as a WW I Camp Upton shed that was moved and repurposed as a privy. The archaeological report recommended looking over the area after clearing and before construction of the LISF.

2009 – A Stage I Archeological Survey for the Proposed Solar Array. Performed by the Institute for Long Island Archeology.

Purpose. This project was to investigate the potential for archeological concerns within the area known as the WW I Remount Depot. The area was identified for development for the LISF. The Remount Depot was the area of WW I Camp Upton where approximately 40,000 horses and mules were held and cared for. Ancillary facilities in the area included YMCA, shops, and support structures.

Area Surveyed. Approximately 33 acres south of Brookhaven Avenue and north of the Core Preservation Area/Compatible Growth Area boundary for the Central Pine Barrens. The area is composed primarily of white pine groves planted by the Civilian Conservation Corps in the 1930s. A total of 504 shovel test pits spaced at approximately 49-foot intervals were dug.

Results. Shovel test pits resulted in minimal discoveries that included slag, mule shoes, and mule shoe nails. Surface surveys documented two concrete foundations, two brick-lined wells (dry wells), and a potential cistern.

2016 – A Stage I Archeological Survey for the Discovery Park Area. Performed by Louis Berger.

Purpose. This project was conducted to determine the likelihood of encountering areas of archeological concern within the area proposed for development of a public/private ventures associated with Laboratory scientific initiatives. The area is to be called Discovery Park and includes the current Apartment Area plus surrounding area to west, north, and northeast of roads encircling the Apartment Area comprising approximately 56 acres. The core area of the Apartments was excluded from survey due to extensive disturbance from 1921 to present.

Area Surveyed. Approximately 56 acres. The area of potential effect (APE) consists of the 23-hectare tract of woodland located in the southwestern portion of the BNL property, bounded to the west by Suffolk County Route 46 (William Floyd Parkway), to the north by Princeton Avenue, and to the south and east roughly by Yale and Yaphank roads. This portion of BNL once housed World War I- and World War II-era buildings related to former medical facilities, all of which have been removed.

Results. To investigate areas of archaeological sensitivity, subsurface testing was conducted June 15 to 24, 2016. During the investigation Louis Berger excavated 989 shovel tests. Louis Berger relocated and delineated a World War I Camp Upton military hospital site (A10302.002283) that was identified in 2001. A total of 2,099 artifacts from the World War I and World War II eras were collected. Louis Berger's investigation delineated the entire site within the BNL property.

The midden and adjacent trash scatters are associated with hospital activities. The materials appear to have accumulated from a number of structures, and the deposits are not specifically related to either World War I or World War II period occupations. The features identified during the survey, while associated with the World War I Camp Upton, do not relate to a specific event or pattern of events that would make them significant, are not associated with a specific person, and do not exemplify any method of design or construction that would make them significant (National Register Criteria A-C). Beyond documenting these features as a part of the archaeological survey, there does not appear to be any additional information to be gained by additional study (Criterion D). The hospital complex drainage and road features do not appear to be related or any specific military activities; instead they are associated with very basic engineering solutions to the sort of common everyday problems of large facilities constructed during the early twentieth century. The site deposits are well dispersed around the former building locations, and a substantial portion of this former complex has been disturbed by the subsequent development of BNL.

It is Louis Berger's opinion that no additional investigation is required at Site A10302.002283, and that no National Register-eligible archaeological sites are present in the APE.

3.4.2.6 Archeological Survey Status. A large majority of the BNL site has not been surveyed. While test excavations have revealed virtually no evidence of prehistoric and little evidence of historic cultural resources, additional testing and investigation has been recommended. In the 1974 report, Johannemann recommended that any areas proposed for construction or terrain alteration and not already surveyed, should require investigation (Johannemann 1974). Bernstein concluded that the BNL site might contain significant archeological resources, especially those related to the historic period after 1900 (Bernstein 2001b). The New York SHPO recommended that more in-depth archeological surveys, including field-testing where determined necessary, be conducted wherever ground-disturbing activities may be planned. An assessment of BNL's archeological field survey requirements was performed in 2003 (CRP-1003-01). Output from this

report, including areas recommended for future archeological surveys, has been incorporated into BNL procedure RC-SOP-501 *Project Reviews for Potential Impact to Cultural Resource*." Refer to Section 4.2.2 Archeological Methods for descriptions of area field survey requirements.

3.4.2.7 Other Inventory/Assessment Activities. Activities that do not fall into either the archeological or structure/facility survey categories are presented below:

- ***Cultural Resources Inventory of BNL.*** In 2001, BNL contracted with ILIA to document the prehistoric and historic period contexts for the property and to determine the probability of the presence of previously unknown cultural resources (Bernstein October 2001b). See CRP-2001-01 for additional details.
- ***Evaluation of Work War I Features.*** In 2002, BNL contracted with ILIA to document the location, extent, and nature of WW I period-features at BNL. This study also assessed whether the determination of National Register of Historic Places eligibility for WW I trenches on the property, made during the mid-1970s, applied to other trenches on the BNL property (Merwin and Lam 2002). See CRP-2002-02 for additional details.
- ***Camp Upton Historical Collection Inventory.*** In 2002, cultural resource project CRP-2002-03 consisted of inventorying and cataloging the entire Camp Upton Historical Collection. The scope of the project included developing accession and collection record systems and database tables, and digitally photographing each item in the collection.
- ***Historic Film Reels.*** In 2000, a collection of historic 16-mm film reels was converted on to high quality Betacam SP-BCT-90M tapes. A listing of the 19 tapes is available from the Cultural Resource manager. (Note: the recordings were not available for digitization in 2021 and tapes may have been lost or destroyed)
- ***Video Database and Digitization Project.*** In 2021, the Photography and Graphic Arts group working with the Cultural Resources program established a project to catalog a significant number of reel and video tapes in multiple formats that had accumulated from the 1980s to approximately 2020 when the Lab's videography retired. The tapes were categorized as to their likely importance and those of higher historical value were digitized for archival and access purposes. The database documents whether videos are stored onsite, digitized, or sent to Iron Mountain storage. A total of 1,448 tapes were digitized.

3.4.3 Excavation

Test excavations were performed as part of each of the archeological surveys identified above. No large-scale excavations have been performed or planned to date.

A large portion of the developed areas on the BNL site has experienced major ground-disturbing activity since the inception of BNL in 1947. Therefore, the potential for cultural resource artifacts in these areas is relatively low. Areas that have been identified as containing earthworks (training trenches) and foundations dating from World War I have remained relatively undisturbed. Areas in the immediate vicinity of historic sources of fresh water such as ponds and the Peconic River were identified as having the potential for prehistoric/historic Native American cultural resources. There are currently no defined plans for large-scale archeological excavations.

3.4.4 Structure and Facility Management

Specific CR management strategies have been, or are in the process of being, developed for the buildings or structures identified in Appendix B, "Cultural Significance Categories Table," as Category I or II facilities or programs. Appendix C contains the individual strategy forms. Some strategies may call for the development of specific architectural management plans or guidance documents to further describe specific requirements for the building. CRM concerns are being integrated into existing project review and building maintenance planning mechanisms. To date, the following mitigation efforts have been initiated.

Brookhaven Graphite Research Reactor (BGRR). As part of the Memorandum of Agreement between DOE and the NYSHPO on mitigating the decommissioning of the BGRR, the following projects have been initiated to date (Reference Attachment 37, MOA for BGRR).

- BNL contracted to inventory and appraise records relating to the BGRR's design, construction, operation, and maintenance. The records were assigned to series and retention recommendations were made for all items. A Microsoft Excel database of all records was developed, and key-word descriptors were established. A list of all records and photographs in the BGRR files was produced. All records and photographs were retained onsite through the completion of the BGRR D&D, with most sent to federal repositories for permanent storage. This project was performed from August 2000 to August 2001. (See CRP-2000-02).
- A video history of the BGRR was completed and distributed in September 2003. This project includes video interviews of several individuals directly involved with the BGRR including designers, project engineers, and scientists, and incorporates numerous photographs of the BGRR from construction and throughout its operation. See CRP-2000-03 for additional information.
- Development of a Researcher's Guide identifying specific information and documentation resources associated with the BGRR. This project is completed with final documents being sent to federal repositories in 2012.
- Additional BGRR mitigation actions include an assessment and curation of BGRR related tools and equipment.

World War II-Era Building Demolition Mitigation Packages. While the WW II-era buildings on site have been determined not to be eligible for listing on the National Register, they do represent a unique era in the history of the BNL site and are, therefore, considered items of "cultural interest." The objective of these mitigation packages is to ensure that information related to the site's appearance and utilization throughout the different periods is retained. Mitigation packages, consisting primarily of photos and plan drawings (earliest available and current), were developed, and submitted to the NYSHPO for the following buildings or types of buildings identified for demolition:

- Warehouse Buildings 86, 88, 89, 90, 91, 96, 158, 206, 207, 208, 209, 207, 208, and 209
- Buildings: 118, 184, 193, 194, 426, 459,
- Remaining WW II era buildings

Actions.
- Complete BGRR mitigation actions identified in the MOA as financial resources permit (Researchers Guide and tools/equipment evaluation/curation). Must be completed to fulfill MOU.
- Complete mitigation actions identified in the MOA for the 1960s era apartments (i.e., kiosks)
- Complete mitigation actions identified in the MOA for the BMRR Stack
- Integrate CR management strategy into BNL planning and maintenance programs.

3.4.5 Laboratory Treatment

Any laboratory treatment (processing, analysis, or special studies) of cultural resource materials, recovered as part of formal surveys, would have been performed by the professionally trained and qualified organizations that conducted the survey. At this time, minor cleaning actions are the only treatment method believed to have been performed. This process will be followed for future surveys. If the need for specific treatment actions were identified, BNL would consult with knowledgeable and qualified resources to determine the appropriate course of action.

3.4.6 Curation

The Camp Upton Historical Collection has been a part of the Laboratory since approximately the late1970s, and includes items found on site, as well as numerous donations. During CRP-2002–03, qualified personnel performed a complete inventory of the collection, including digitally photographing each item. Each item was then identified and stored in accordance with professional curation standards. A formal accessioning and

cataloging system was established, and recommendations have been made with regard to future curation issues. This accessioning and cataloging system will be utilized for future collection management actions.

Actions.

- The Camp Upton Collection has been moved multiple times and items had been removed without documentation. A full re-inventory needs to be completed.
- Establish a logbook system to document item removal/return associated with loan of items.

3.4.6.1 Curation Status. BNL currently does not have a formal program addressing curation of CR materials found as part of cultural survey or excavation actions, or items recovered onsite by employees. Over the years, BNL employees and contractors have recovered items on site, both surface finds and those as a result of construction project excavations. Due to the lack of a formal cultural resource program, many of these items were, and currently are, retained in the possession of individuals.

*Action***.**

- Develop a curation/treatment program procedure addressing items recovered during formal surveys, old "finds" retained by individuals, and new discoveries.
- Storage – cultural items are currently stored in multiple locations – a larger storage room for cultural resources should be acquired to consolidate, catalogue, and conserve them.

3.4.7 Preservation

BNL currently does not have a formal program addressing preservation of cultural resources. Activities related to preservation are described below, and actions that must be evaluated for possible implementation are presented as goals/actions.

3.4.7.1 Protection from Natural Forces. At this time, this type of activity primarily applies to two categories of resources, World War I features, and large scientific equipment stored outside. Other cultural resources, (buildings, and artifacts contained within) are protected by the Laboratory's overall fire protection program and wildfire management plan.

World War I Features (training trenches and foundations). In CRM Project #CRM-2002-02, the consultants recommend a preferred treatment of these features by preserving an adequate wooded buffer to minimize potential damage from construction or erosion (Merwin, et al. 2002). They also stated that erosion or other natural forces do not appear likely to immediately threaten most of these features. They recommended that a program be developed to periodically evaluate the extent and rate of erosion by performing sample measurements and comparing them to those documented during the 2002 and 1970s surveys, where possible. Attachment 8 identifies the location of these resources.

Equipment related to programs/facilities of recent scientific significance. One of the strategies associated with managing BNL facilities and programs of recent scientific significance is to maintain select pieces of equipment available for interpretation. Some of these items were set aside 10 to 20 years ago and are now showing signs of deterioration from exposure to the elements. Protection or maintenance plans need to be developed for these types of items.

Actions

- Develop a monitoring plan for the WW I trenches.
- Develop evaluation/protection/maintenance plans for the scientifically significant display equipment.
- Evaluate the potential effects of wildland fires on cultural resource areas and develop appropriate documentation (Section 106, Procedure(s), MOA, etc.) to address issues identified in DOE G 450-1.4 *Wildland Fire Management Program.*

3.4.7.2 Protection from Human Forces. The BNL NEPA program reviews projects for their potential environmental impacts and includes cultural resource aspects in the review process. In addition, BNL's Digging and Trenching Permit process includes a review and signature by environmental program personnel

knowledgeable in cultural resources. CRM concerns are being integrated into existing project review and building maintenance planning mechanisms to ensure significant features, sites and structures are not inadvertently damaged. A BNL site map identifying known cultural resource areas, sites, and buildings has been developed (Attachment 8, limited distribution only). This map will be used by the CRM program in reviewing projects and to inform affected personnel/groups involved in project planning actions.
A similar map was distributed to the BNL Fire Group in order to minimize the potential for disturbing cultural resource areas in the event of a brush fire. The Natural/Cultural Resource Manager has also briefed the Fire Group on this issue.

Protection of cultural resource areas from illegal actions is performed indirectly in that the entire BNL site is a posted and restricted area that is patrolled by security personnel.

In 2004, as a result of evidence of recent "pot hunting" and disturbance prior to the archeological evaluation, protective fencing was erected, and warning signs posted around a 0.4-acre area encompassing the W.J. Weeks House Site. The site is located away from routine security patrol areas and will be monitored periodically by cultural resource personnel (Reference CRP-2004-03).

Direct measures to protect other cultural resources have not been evaluated or developed.

Actions
- Develop cultural resource training; target specific groups such as Integrated Facility Management supervisors and engineers, security, fire, IFM engineers, work control planners, etc.
- Develop a periodic surveillance process to monitor specific cultural resources as determined appropriate.

3.4.8 Research
There has been limited research efforts to date. Potential topics for research include, but are not limited to:

- WW I Trench Warfare Training Trenches – construction techniques (experimental vs. field manual)
- Existence of Native American sites around freshwater areas
- Nineteenth-century house sites (refer to section 3.4.2.5 Archeological Surveys for addition details)
- Historic trails and roads within the BNL site
- Scientifically significant facilities, and their contributions (history of accelerators, history of reactors, history of specific programs like radiopharmaceuticals).

3.4.9 Outreach
While the Environmental Compliance staff is responsible for the BNL Cultural Resource Management Program, the program is complemented by other BNL organizations, including the Stakeholder Relations Office. This section describes current outreach activities performed by these groups, along with past outreach accomplishments.

3.4.9.1 Activities on the DOE Site.

Camp Upton Historical Collection – Since the 1970s, BNL has maintained a collection of items related to the U.S. Army's occupation of the property as Camp Upton during both World War I and II (Reference section 3.3.2 for additional information on the collection). In the past, displays have been established and the collection had been opened to the public during BNL "open house" tours and through scheduled appointments. Periodically, portions of the collection were temporarily displayed in the lobby of Berkner Hall as part of BNL's Summer Sundays open house days. Small displays are currently at Berkner and Building 400.

Current Status. In 2020, the collection was relocated to a vacant lab in Building 555 (Chemistry). The room has a climate-controlled environment (air conditioned/heated). While a majority of the collection is currently not on display, the new storage arrangement provides access to the collection for inventory, and selection of

items for development of small-scale temporary displays. Reference CRP-2002-03 for details on the inventory and catalog project.

Camp Upton Related Publications. Over the years BNL has published several articles related to Camp Upton history in its weekly employee newsletter, the Brookhaven Bulletin. Other promotional type publications have included postcards of Camp Upton photos, flyers, etc.

Camp Upton Video. A 12-minute video on the history of Camp Upton was produced by BNL in 1985. The video has been shown as part of the collection tour, during open houses, and as part of off-site presentations.

BNL History Website. The following website, managed by Stakeholders and Community Relations, presents photos and information pertaining to the scientific history of BNL, including major facilities, discoveries and Nobel Prize awards:
https:/www.bnl.gov/about/history/.

Cultural Resources Website. The following website, developed in 2002 and managed by the Cultural Resource Coordinator, presents information related to the cultural resource management program, and links to the related websites identified above: http://www.bnl.gov/esh/env/cresources/.

BGRR History Video. This 64-minute video presents a history of the BGRR through the recollections of key individuals that contributed to its success as a premier research tool, throughout its 18-year operating history, (1950–1968). BNL Historian Robert Crease narrates the design, construction, operation, scientific research and shutdown of America's first nuclear reactor designed for peacetime civilian applications. Physicists, engineers, and scientists describe the challenges and rewards of their accomplishments, along with the experiences of everyday life associated with the BGRR. This video was completed and distributed in September 2003. The video is available from the Cultural Resource program.

Publications. BNL Historian, Robert Crease has published articles on Brookhaven programs in prominent history of science journals and elsewhere. Listed below are some of those titles.

"Fallout: Issues in the Study, Treatment, and Reparations of Exposed Marshall Islanders" [this involved a BNL program], in *Exploring Diversity in the Philosophy of Science and Technology*, ed. by Robert Figueroa and Sandra Harding, Routledge, 2003, pp. 106–125.

"Anxious History: The High Flux Beam Reactor and Brookhaven National Laboratory," *Historical Studies in the Physical Sciences* 32, Part 1, 2001, pp. 41–56.

"Conflicting Interpretations of Risk: The Case of Brookhaven's Spent Fuel Rods." *Technology: A Journal of Science Serving Legislative, Regulatory, and Judicial Systems*, V 6 (1999): 495–500.

"The History of Brookhaven National Laboratory Part Six: The Lab and the Long Island Community, 1947-1972." *Long Island Historical Journal* (*LIHJ*), 9:1 (Fall, 1996): 4–24.

"The History of Brookhaven National Laboratory Part Five", *LIHJ* 4:2 (Spring 1995).

"The History of Brookhaven National Laboratory Part Four: Problems of Transition," *LIHJ* 7:1 (Fall 1994): 22–41.

"The National Laboratories and Their Future," *Forum*, Winter, 1993.

"The History of Brookhaven National Laboratory Part Three," *LIJH* 6:1 (Fall, 1993).

"The History of Brookhaven National Laboratory Part Two: The Haworth Years," *LIHJ* 4:2 (Spring 1992).

"The History of Brookhaven National Laboratory Part One: the Graphite Reactor and the Cosmotron," *LIJH* 3:2 (Spring 1991): 167-188.

Lectures. BNL Historian Robert Crease has presented eight BNL lectures related to the history of BNL's development, its scientific achievements and facilities.

3.4.9.2 Activities Not on the DOE Site. Activities not carried out at the BNL site are listed below.

Making Physics – A Biography of BNL, 1946-1972. Written by BNL Historian Robert Crease, this book describes the history of BNL from the Laboratory's inception in 1946 until 1972 and provides a unique view of the people, instruments, science, and politics of BNL history (Crease 1999).

Presentations to Off-Site Organizations. Over the years, many presentations related to Camp Upton have been given to off-site organizations such as local civic associations, historical societies, libraries, and community groups. Attachment 13 lists presentations and is updated periodically. **Note**: The Stakeholder and Community Relations Office maintains reports that document each outreach activity performed by their group.

3.4.9.3 Outreach Status. Community outreach activities to date have tended to focus on one aspect of BNL cultural resources: Camp Upton and the associated historical collection. Although this is a major part of the program, additional areas should be conveyed such as science history and overall site history (Pre-WW I, CCC, etc.). In 2022 as part of the 75th Anniversary celebrations a "History of BNL" talk was developed and can now be used as part of the Cultural Resources outreach program.

Actions

- Increase interactions with local historical societies and other internal/external outreach opportunities, offering presentations on BNL history and the BNL Cultural Resources Management Plan.

3.4.10 Kiosks

MOAs between the Department of Energy Brookhaven Site Office and the NYSHPO require the development of several Kiosks focusing on different aspects of history on the BNL site including:

- Discovery Park
  - 1960s Apartments
  - Entrance Road WW I and Now
  - WW I Hospital Complex
  - WW II Hospital Complex
  - BNL Medical Complex and Apartments
- Brookhaven Medical Complex
  - Medical Complex
  - Brookhaven Medical Research Reactor

Actions

- Establish Kiosk Committee to develop required kiosks

3.5 LEGAL COMPLIANCE ACCOMPLISHMENTS

3.5.1 National Historic Preservation Act 1966 (NHPA), Executive Order 11593, and 36 CFR 800

All BNL projects are reviewed for their potential impacts on the site's historic resources as part of BNL's formal NEPA program. The BNL Standards Based Management System (SBMS) contains the subject area

"NEPA and Cultural Resource Evaluations" describing the review process. Section 4.2.2 of this CRMP, NHPA Section 106 Reviews, describes the Section 106 process employed by BNL.

The BNL Cultural Resource Management program actively promotes efforts to identify properties eligible for listing on the National Register of Historic Places. Cultural Resource Project No. CRP-2000-01 evaluated all BNL buildings and structures for National Register eligibility. Since the BNL cultural resource program has become more focused, starting in 1999, additional properties have been determined eligible for listing; the Brookhaven Graphite Research Reactor (BGRR) complex (Bldgs. 701, 703, 801) and the High Flux Beam Reactor (HFBR) complex (Bldgs. 750 & 751), 1960s era apartments (Bldgs. 364 & 365), Building 120 (barracks portion), Berkner Hall (Bldg. 488), Medical Complex (Bldg. 490 & 491), Physics and Computational Sciences (Bldgs. 510 & 515), Instrumentation (Bldg. 535), Chemistry (Bldg. 555), Accelerator Test Facility (Bldg. 820, 820A, 820B), Bldg. 830, Bldg. 902 (1946-1965 portions), Alternating Gradient Synchrotron complex (Bldgs. 901, 901A, 911, 912, 913, 913A-E, and 930), the WW II water tower (STO-0049), and the Gamma Forest. In 2002, the 1979 determination of eligibility for the World War I training trenches in the ISABELLE project area of impact was evaluated and considered to extend to the other trenches and WW I features extant on the BNL property (Merwin et al. 2002). Additionally, the archeological investigations of the Weeks and Weeks/Campbell home sites suggested that they are eligible for listing. Sections 3.3.2 and 3.3.4 of this CRMP provide descriptions of these eligible resources. Section 4.0 includes specific strategies for managing each identified cultural resource.

3.5.2 American Indian Religious Freedom Act (AIRFA) & E.O 13007

To date, resources important to Native Americans, such as sacred sites, traditional-use resources, and Native American cultural items, have not been identified on the BNL site. No local Native American group has indicated that such sites may be present on BNL property. If such items are identified in the future, BNL will initiate appropriate consultation with Native American tribes and the NY State SHPO, and the requirements associated with AIRFA and Executive Order 13007, *Indian Sacred Sites, dated 5/24/96, will* be implemented. Refer to the Archeology Sensitivity section of Appendix A for additional details.

The Shinnecock tribe is the only federally recognized tribe on Long Island. However, in their recognition documents their historic tribal range does not extend into the area of BNL. The Unkechaug tribe located on the Mastic peninsula south of BNL is recognized by New York but is not federally recognized.

3.5.3 Archeological Resources Protection Act (ARPA) – 1979, Amended 1988

Much of the material contained in this section is based on Bernstein and colleagues (2003). ARPA regulations apply to remains of past human activities or lifeways that are at least 100 years old. Sites located on BNL property that fall under the purview of ARPA include: the W.J. Weeks House Site, the Weeks-Campbell Site, and WW I trenches and features of Camp Upton.

3.5.3.1 Archeological Permits. ARPA requires issuance of a permit prior to the excavation of archeological resources (at least 100 years old) on federal property. DOE has issued several federal archeological permits to date for an action on the BNL site (see Section 3.4.2.5, Archeological Surveys, for additional details). A permit is not currently required for excavation of CCC-, or World War II-era sites, however, as a best management practice, the permit process would be instituted for all archeological actions.

3.5.3.2 Archeological Protection. The BNL site is a relatively secure area. Unauthorized individuals are not permitted on the BNL site and identification badges are required to be worn by all employees and guests. Although the property is posted and BNL security forces regularly patrol the property, it is not fenced and unauthorized access is possible. Reference section 3.4.7.2 for details on specific protective measures that have been implemented.

3.5.3.3 ARPA, Section 10c. Section 3.4.9 of this CRMP identifies outreach activities associated with BNL cultural resources, including program goals.

3.5.3.4 ARPA, Section 14. Sections 3.4.2.5 and 3.4.2.6 of this CRMP identify archeological surveys performed to date, along with the status and goals for future surveys.

3.5.4 Native American Graves Protection and Repatriation Act (NAGPRA)

To date, no artifacts requiring invocation of NAGPRA regulations have been identified on the BNL site. If such items are identified in the future, appropriate consultation with Native American tribes and the NY State SHPO will be initiated, and the requirements associated with NAGPRA will be implemented. Refer to the Archeology Sensitivity section of Appendix A for additional details.

3.5.5 Curation of Federally Owned and Administered Archeological Collections (36 CFR Part 79)

Curation of Federally Owned and Administered Archeological Collections (36 CFR Part 79) addresses requirements that "generally include those that are the result of a prehistoric or historic survey, excavation or other study conducted in connection with a federal action, assistance, license or permit" (Bernstein et al. 2003). "This means that materials collected by other means (e.g., donation, field finds) are not specifically covered under CFR Part 79" (Bernstein et al. 2003). The Camp Upton Historical Collection contains items found on site by individuals, as well as those obtained through donation. Regardless of whether the stated requirement is directly applicable, BNL is committed to managing the collection in accordance with established museum standards, to the extent that resources permit. See Section 4.2.4 for additional information on curation methods.

Materials that are classified as federal archeological items are to be treated and curated in accordance with 36 CFR Part 79 requirements. The following pre-existing collections may fall under the purview of the requirements:

1. Items from "A Stage 1B Archeological Survey for the Proposed Railway Extension at BNL" include artifacts. According to the original report and field records, those artifacts include nails, two coins, and pieces of bottle glass, window glass, coal, brick, porcelain, insulator, mortar, and concrete.
2. A small number of items collected on the surface of a WW II-era midden during the course of the trench-mapping project (CRP-2002-02).
3. Artifacts from the Islander East Pipeline Project, including one piece of "fire-charred whiteware and one piece of quartz chipping debris" and associated records.
4. A small collection of twentieth-century material and associated records from the Eastern Long Island Extension Project.
5. Artifacts from the W.J. Weeks House site and the Weeks-Campbell site.
6. Artifacts from the Archeological Survey of the Privy Site.
7. Artifacts from the Archeological Survey for the Solar Facility on the BNL Site.
8. Artifacts from the Archeological Survey for Discovery Park

3.5.5.1 Assessment of BNL Compliance to 36 CFR Part 79. The following summary highlights a rough assessment of the CR program's compliance with 36 CFR Part 79, Curation of Federally Owned and Administered Archeological Collections. **Note**: Areas requiring development are identified in Section 3.5.5.2.

Standards for determining if a repository possesses capability to provide long-term curatorial services:

Requirement: Able to accession, label, catalog and store using professional museum and archival practices.
Assessment: CR Project # CRP-2002-03 inventoried all items in the Camp Upton Collection and developed a catalog/accession/labeling system. Future additions to the collection will utilize these established protocols.

The processes outlined in Section 4.2.1, CRM Records and Reports, will be used when BNL staff encounter previously undocumented artifacts or records and when BNL accepts materials and records collected or produced during compliance or research projects. These items will be stored in accordance with professional museum and archival practices by either integrating them into the Camp Upton Collection, establishing a separate CRM collection at BNL, or arranging to curate items and records with a qualified organization off site. These items may not always be accessioned into the Camp Upton Collection.

Requirement: Able to maintain records related to the collection such as description, location, accession, approved loans/other uses, field notes, inspection and environmental monitoring records, deaccessions, etc. *Assessment*: The systems identified above (CR Project # CRP-2002-03, and CRMP Section 4.2.1) provide a solid foundation for these records.

Requirement: Maintain dedicated facilities and equipment to store, study and conserve the collection …and keep under physically secure conditions, including the following:

- **Facility meets fire, building and safety codes.** *Assessment*: The storage facility meets all BNL fire and safety codes. However, the facility does not meet the National Fire Protection Association (NFPA) Standard on Cultural Resources, NFPA 909. NFPA 909 includes requirements for firewalls separating storage areas and smoke detectors protecting storage rooms, both of which are lacking in the BNL facility.
- **Appropriate fire detection and suppression system.** *Assessment*: Fire detection and suppression systems are present in the storage area. See above assessment.
- **Appropriate intrusion detection and deterrent system.** *Assessment*: Facility does not have an intrusion detection and deterrent system. However, building key distribution is limited, the BNL site is routinely patrolled, and gate access is controlled.
- **Adequate emergency management plans for responding to fires, floods, etc.** *Assessment*: BNL's emergency response organization. Local Emergency Plans, and Integrated Facility Management program systems adequately address this issue.
- **Additional security for fragile or valuable items.** *Assessment*: Collection items are stored in locked cabinets or display cases.
- **Limiting and controlling access to keys.** *Assessment*: BNL maintains a key control system that minimizes the distribution of building keys, and keys for collection cabinets are on a very limited availability (one or two individuals).
- **Inspections for security and environmental controls.** *Assessment/goal*: A program for conducting regular inspections needs to be developed and implemented.

Requirement: Require staff and consultant to be qualified museum professionals. *Assessment*: Current staff are not qualified museum professionals; however, consultants hired to perform CRM projects are qualified and experienced.

Requirement: Handle, store, conserve, and exhibit collection in a manner that protects items from adverse temperatures, relative humidity, visible light, ultraviolet radiation, mold, insects, etc.
Assessment: The Camp Upton Collection is stored in a climate-controlled building.

Requirement: **Store site forms, records, inventories, computer disks, reports, etc. in a manner to protect them from theft and fire, such as:**

- **Storing in properly insulated, fire resistant, locking cabinets or in a location with a fire suppression system.** With moves of materials proper storage of paper and other flammable collections need to be assessed.
- **Storing a duplicate set of records in a separate location, or ensuring records are maintained by another party such as SHPO, university, etc.** *Assessment*. Copies of CR reports are provided to the onsite DOE Office as well as the NYSHPO. The author maintains BNL-generated documents, with a separate copy filed in the departmental records file system. Copies of the Camp Upton Collection inventory and accession files are maintained in separate locations. Digital records are stored in the CRM office, and on a password protected BNL network server. Print copies of these records are also maintained with the collection.

Requirement. **Periodically conduct inspections and inventory for security and environmental controls, including:**

- Assessing condition of collection, signs of deterioration/damage
- Inventories to verify location of material remains and records
- Have qualified museum professionals conduct inspections and inventories.

Assessment. A program for conducting regular inspections and inventories that satisfies the above requirements needs to be developed and implemented.

3.5.5.2 Areas Needing Action. The following actions would help to ensure that all CR-related activities are maintained in compliance with applicable regulations and best management practices.

Actions

- Formalize Camp Upton Collection catalog/accession/labeling/storage system.
- Evaluate the appropriate means of establishing a catalog/accession/labeling/storage system for general CR materials and records such as integrating them with Cultural Resource Tagging Program and the Camp Upton Collection, establishing a separate CRM collection at BNL, or arranging to have a qualified offsite organization develop a records system and/or manage collections in a designated space.
- Include Camp Upton Collection and BNL Artifact Storage in routine Cultural Resource Assessments (5-year cycle).

3.5.6 Executive Order 13287, Preserve America

Executive Order 13287, Preserve America, requires each federal agency to ensure that the management of historic properties in its ownership is conducted in a manner that promotes the long-term preservation and use of those properties as federal assets, and (where consistent with agency missions and governing law) that the nature of the properties contributes to the local community and its economy. The BNL CRMP meets the intent of this policy by formally documenting BNL's historic resources and associated management strategies. Cooperation with programs that contribute to the local community and its economy is encouraged and will be supported, provided the necessary resources are available.

The Order also requires federal agencies to prepare specific cultural resource assessments/reports. Upon request, BNL will work with DOE to prepare and/or provide the necessary information for the applicable actions and reports. Most of the information will likely be taken from various sections of the CRMP.

3.5.7 Other Regulatory or Reporting Requirements

The Department of Energy periodically requests information on cultural resources and cultural resource management. The Cultural Resource manager should routinely participate in DOE HQ quarterly Cultural Resource webinars.

4.0 CULTURAL RESOURCE MANAGEMENT STRATEGIES AND METHODS

This section describes management strategies associated with either individual resources or groups of resources, and the methods and protocols utilized in their management. Programs/systems requiring development are also identified. Applicable portions of this section will be revised as these new systems are developed and implemented.

4.1 CR Management Strategies

Overview: In developing an overall strategy for managing BNL's culturally significant resources, information from the following sources was used to identify those assets that should be appropriately recognized, documented, and made available for research, interpretation, and appreciation: institutional knowledge, contractor evaluations, and NYSHPO input (including building significance rankings). Approximately 34 principle cultural assets were identified and categorized (ranked) according to the significance levels outlined in Section 4.1.2. These principal assets can be grouped into four types of resources:

- *Historic or Unique Sites.* Includes foundations and earthwork features related to WW I Camp Upton, nineteenth-century house sites, and a unique area that encompasses scientific, cultural, and natural resource aspects
- *Scientific Achievement and Engineering Design.* Includes facilities and programs related to BNL scientific achievements and design
- *Architecturally Significant.* Buildings designed by famous architects

- *Period Representation.* Buildings that are not NRHP eligible, but representative of two periods in the site's history (the 1930s Civilian Conservation Corp and 1940s Camp Upton).

Note: Attachment 15 lists the principal resources within their respective types. Management Strategy Forms must be developed for individual resources that have been recently determined to be eligible for NRHP, taking into account BNL's planned uses for the structure or area, interpretive options, contractor recommendations, and realistic funding and resource expectations (see Section 4.1.1 below and Appendix C). Strategies associated with additional resources and those that may be considered supporting assets are described within this section of the CRMP. Strategies may also change based on agreements negotiated with the NYSHPO (e.g., programmatic agreement).

4.1.1 Management Strategy Forms

A Cultural Resource Management Strategy Form (Attachment 14) is to be developed for each major resource to describe how it will be managed in a consistent and concise manner. Each section of the form is to be completed to the extent that a strategy has been formulated. Two sections of the form, "Plans for Bldg. or Site" and "Treatment / Mitigation Plans," are designed to serve as the principal guide and agreement for managing the resource. Two "levels" of Treatment/Mitigation Plans are also presented that identify more specific types: Level A lists activities that have already been achieved, are in progress, or are considered achievable. Level B lists activities that would likely require considerably greater resources (funding, manpower, etc.) and would only be performed if those resources could be allocated. Revisions that change the scope or intent of these sections require BNL/DOE review and approval and must be submitted to NYSHPO. Other sections that provide background and supporting information may be revised informally. Once a form has been developed, and upon major revision, the BNL CRM program has the responsibility to:

- Obtain concurrence from BNL management
- Obtain concurrence from DOE-BHSO
- Ensure DOE-BHSO submits document to SHPO for review and 30-day comment period
- Incorporate forms into Appendix C of the CRMP.

Each Strategy Form shall include a Revision Number and Issue Date, so that individual forms may be revised/added without having to update the entire CRMP. The forms will serve as the summary document outlining the strategy by which the associated resource will be managed. In some cases, more detailed treatment or mitigation plans and procedures may be required to address specific issues. These plans are to be referenced on the Strategy Form.

Appendix C, Cultural Resource Management Strategy Forms, contains the detailed strategy forms developed to date.

Goal. Develop Cultural Resource Management Strategy Forms for all major resources and obtain appropriate approvals. Note: This effort may be impacted by the decision for developing a Programmatic Agreement with the NYSHPO for the management of historic resources.

Actions

1. Update existing strategy forms.
2. Prepare new strategy forms for historic resources recently determined to be eligible for listing.

4.1.2 Cultural Significance Categorization Levels

Three categories defining levels of potential historic significance are described below, along with general treatment and/or mitigation strategies. Appendix B, the Cultural Significance Categories Table, identifies specific buildings, sites, or programs included within each category.

4.1.2.1 Cultural Significance Category Descriptions. The three categories for cultural significance are described below, along with the treatment or mitigation options.

Category I. A building, site or program determined to be historically significant due to historic context, architecture, engineering and design, direct association with important personages, or scientific achievement. The resource(s) may be individually eligible for listing on the National Register or eligible as part of a facility (i.e., AGS complex); however, eligibility is not a requirement.

Treatment and/or mitigation: Some degree of treatment and/or mitigation is necessary to ensure that cultural significance is retained and available for interpretation. Examples include, but are not limited to:

- Specific treatment or architectural management plan, if architecturally significant
- Documentation of engineering and design, and scientific achievements (photos, scale models, document archives, etc.)
- Preservation/display of associated equipment.

Category II. A building, facility, or site that directly supported a significant BNL program, or uniquely represents a specific period in the evolution of BNL's site history and has had little alteration. Building, facility, or site may be individually eligible for National Register or eligible as part of a facility (i.e., AGS complex).

Treatment and/or mitigation:

- For support buildings, as-built drawings and photos; documented description of structure's role (may be included in existing facility description documents).
- For period structures: treatment plans to minimize further alteration of specifically identified aspects (implementation is funding dependent). Mitigation would entail documentation of as-built drawings and photos.

Category III. Buildings or structures that supported lab-wide programs and may be representative of the evolution of government use of the site. Buildings in this category include World War II-era buildings. During a site visit (January 3, 2003), NYSHPO agreed that these structures would not be considered eligible for the National Register. However, since these types of structures do represent a distinct period in the site and BNL history, the following means may be used to document their association.

Treatment and/or mitigation. Document the development and evolution of the site by archiving engineering and plan drawings of site layout, building plans and photos for select structures, and aerial photos.

4.1.3 Scientific Facilities and Programs

General management strategies associated with groups of resources, and those not described on Strategy Forms, are presented in this section.

Many of BNL's structures directly relating to the scientific mission of the Laboratory have reached or exceeded the 50-year mark and have recently been evaluated for historic significance. A significant number have been determined to be National Register eligible either individually, when paired together, or as part of a complex based on architectural design and/or associated with major achievements (e.g. Nobel Prizes). Buildings or structures that are expected to remain in place, architectural guidelines and management plans may be developed to identify specific architectural or functional aspects associated with a structure. Guidelines and management requirements would ideally become part of a programmatic agreement.

4.1.4 World War II-Era Structures

Many structures on the BNL site were constructed in the 1940s as part of World War II Camp Upton. Most of these buildings have been altered to improve their energy and space efficiency and appearance. Typical renovations include vinyl siding, replacement windows, reconfiguration of interior space for office modernization, and so on. Based on correspondence with representatives from NYSHPO, and confirmed by a visit to the BNL site in January 2003, the NYSHPO has indicated that BNL's World War II-era structures do not retain enough integrity to convey their historic function and are therefore not considered eligible for

listing on the National Register of Historic Places with the exception of the barracks portion of Building 120 which is an extant representation of a WW II era Series 700 barracks.

Although these structures are not eligible for listing, they do represent a specific time period in the history of the BNL site. The Cultural Resource Program will use the following means to ensure that this period remains available for interpretation:

- Retain or archive original plan drawings
- Develop an overlay map depicting WW II Camp Upton overlaying existing BNL site.
- Maintain and augment (as possible) the Camp Upton Historical Collection.
- Maintain the two-story barracks-style Building 120 as a "representative structure" from the WW II era. (Refer to associated CRM Strategy Form for additional details.)

By documenting (in this CRMP) the ineligibility of the WW II-era buildings for listing on the National Register, BNL acknowledges that any future actions involving these structures would not require the development of a Section 106 Review package.

4.1.5 Camp Upton Historical Collection

The Camp Upton Historical Collection is one of the unique historical resources present at BNL. It assists in interpretation of the site's history through historic photographs and donated documents and artifacts (refer to Section 3.3.2 for additional descriptive information on the collection). The strategy associated with this resource is one of continued cooperation between two BNL organizations, Stakeholder Relations and Environmental Compliance.

Current expectations are to continue to house the collection at BNL. The collection is currently considered "in storage" and is, with minor exceptions, not on display. The collection is stored according to an inventoried management system, and items are easily accessible to permit establishing temporary displays. Near-term plans (3 – 5 years) include maintaining the collection in its present environmentally controlled (e.g., air conditioned/heated) storage facility. Temporary displays will be established periodically for events such as BNL Summer Sunday open house days.

Goal. Maintain the Camp Upton Historical Collection at BNL and develop ways to increase its availability for interpretation.

Actions

1. Facilitate loan of items, when requested, to museums following BNL Loan Agreement requirements.
2. See additional actions identified in Section 3.5.5.

4.1.6 Document, Audio, Video, and Photographic Archives

BNL maintains documents (architectural and plan drawings, BNL newsletters, etc.), audio-video, and photographic archives in several locations around the BNL complex. Many of these are associated with the early development and operations of BNL, or unique scientific programs.

Goal. Ensure these document collections are maintained as supporting assets to the Laboratory's cultural resource program.

Actions

1. Identify location and content of the potential significant document resources.
2. Develop methods to identify these as historic or supporting resources, verify/assign responsible personnel/organizations/points of contact, and assure proper storage/archiving.
3. Work to digitize photography archives.

4.1.7 Oral Histories

BNL possesses audio and videotape interviews with BNL founders, research leaders and administrators. These interviews were performed by different individuals over the years and consist of the following general groupings:

BNL Oral Interviews. Video interviews, conducted in the mid-1980s, of 30 individuals involved in the founding of BNL. Conducted by Lou Harson, BNL's principal architect (1976–1986) and an amateur historian. These interviews were also transcribed. The videos were digitized in 2021 as part of the cataloging, archiving, and digitization of videos.

Crease Audio Interviews. BNL Historian Robert Crease conducted approximately 100 oral interviews of BNL founders, research leaders, and administrators. The current location of these interviews are unknown but are likely in the possession of Robert.

BGRR History Interviews. Fifteen video interviews associated with the BGRR History video were conducted by Robert Crease in 2000. These were digitized and are available from the Cultural Resource Manager as part of the BGRR Researcher's guide.

Cosmotron Interviews. Robert Crease conducted interviews of three individuals associated with the Cosmotron. The location of these interviews is unknown but are likely in the possession of Robert Crease.

Chemistry Department Interviews. Robert Cease conducted video interviews associated with the Chemistry Department, Ray Davis (Nobel Prize winner), and G. Friedlander. The location of these interviews is unknown but are likely in the possession of Robert Crease.

NSLS History. R. Crease conducted three video interviews, associated with the design and development of the National Synchrotron Light Source, in 2004. The location of these interviews is unknown but are likely in the possession of Robert Crease.

Attachment 35, *Oral History Interviews*, presents a more detailed listing of these resources and will be periodically revised as additional information is identified.

Attachment 36, *BNL Oral History Program - Overview and Planning Document,* presents the current strategy for managing this program.

Goal. Establish a more formal program for conducting oral histories based on National Park Service guidelines.

Actions

1. Identify location and content of the oral histories conducted by Robert Crease.
2. Develop methods to identify these as historic or supporting resources, verify or assign responsible personnel, organizations, or points of contact, and assure proper storage or archiving. Where appropriate retain copy of digitized resources within the Cultural Resources files.
3. Develop a list of key figures in BNL's scientific history for interview.
4. Develop a procedure for triggering and conducting oral histories of employees retiring with [some number to be determined] years of service.

4.1.8 White Pine Trees

Some of the few remaining vestiges of the Civilian Conservation Corp's presence on the BNL site are the groves of white pine trees. These trees were planted as part of the CCC's reforestation project in the 1930s. While the white pines have been determined not eligible for the National Register, the Laboratory currently makes every effort to remove as few trees as possible during any maintenance or construction action, potential impacts to the white pines will receive additional evaluation and consideration. The additional scrutiny will ensure that the white pines remain as an example of a specific and unique era in the site's history. The white pines will also be managed under and integrated with the BNL Natural Resource Management Plan. Several areas of white pines are beginning to have significant 'secondary' growth of

seedlings and saplings, and the need to effectively manage the white pines as both a natural and historic resource has been identified within the cultural resource program and the natural resource program.

4.2 CRM METHODS

4.2.1 Cultural Resource Management Records and Reports

This section is intended to be practical in nature and identifies the basic procedures and protocols BNL intends to follow for managing collections and records. These protocols conform to those in use throughout the United States, with New York State requirements specified wherever appropriate. Much of the information presented in this section was derived from Bernstein (2003a), developed for Cultural Resource Project #CRP-2003-01.

Existing record systems related to cultural resource management are identified and described as follows:

4.2.1.1 File Codes. The following file codes have been assigned to records related to the Cultural Resource Management Program in accordance with the BNL Records Management System. The XX at the end of the file code corresponds to the last two digits of the year the document was generated. (For example, ESD-EC130ER.22 is for a letter generated in 2022.)

CRMP general correspondence	EC130ER.XX
NHPA Section 106 Reviews	EC131ER.XX
SHPO	EC132ER.XX
Accessions	EC133ER.XX
Sites	EC134ER.XX
Projects	EC135ER.XX

The appropriate file code is to appear on the record, and the record is placed in the designated file. All records are retained electronically. The Cultural Resources Management program also maintains “working copies” of these files, records, and reports. Historically important cultural resource records are maintained in filing cabinets within the Environmental Protection Division.

4.2.1.2 Projects. CRM projects initiated in 1999 or later are assigned a unique number as follows:

CRP - year initiated - sequential number

For example, CRP-2002-01 would correspond to the first project initiated in year 2002. Attachment 9 presents a list identifying projects performed or initiated to date.

4.2.1.3 Archeological Site Form and Numbering System. A separate site form is to be completed for every archeological site (prehistoric and historic) on BNL property. If both prehistoric and historic sites are identified at the same location, then separate forms are to be completed for each of the two components. A unique site number, obtained by contacting a representative of the New York State Historic Preservation Officer, is to be assigned to each identified site. **Note**: Only the NYSHPO numbering system should be used for newly discovered sites. Attachment 16, Archeological Site Numbers, identifies sites that have been assigned official NYSHPO numbers to date. Attachment 17, New York State Prehistoric Archeological Site Inventory Form, and Attachment 18, New York State Historic Archeological Site Inventory Form, are copies of the forms to be used by BNL. (Note: since most archeological work on the BNL site is done through contracting with qualified companies, the contractor obtains the appropriate number and files forms with the SHPO either directly or they are filed when reports are submitted to the SHPO for concurrence by BHSO through the NY CRIS).

4.2.1.4 Trench and Foundation Feature Inventory and Forms. The numbering scheme and forms developed during the 2002–2003 evaluation of the World War I-era features at BNL are to be utilized to record information on newly discovered trenches and foundations (see Cultural Resource Project #CRP-2002-02). Attachment 19, BNL Trench Feature Inventory Form, and Attachment 20, BNL Foundation Feature Inventory Form, present examples of these forms.

Action: Complete forms for trench and foundations identified since 2014.

4.2.1.5 Cultural Resources Accession Receiving Report Form. Attachment 21 presents a copy of the blank form that is to be used when BNL staff encounters previously undocumented artifacts or records, and when BNL accepts materials and records collected or produced during compliance or research projects.

4.2.1.6 Camp Upton Historical Collection. Cultural resource project #CRP-2002-03 consisted of inventorying and cataloging the entire Camp Upton Historical Collection. The scope of the project also included the development of accession and collection record systems and database tables. The *BNL Camp Upton Cataloging Project – Completion Report*, March - September 2002, and *Addendum to Completion Report*, February 2003 (Czarniecki et al. 2002, 2003) presently serve as the process for cataloging the collection. These documents describe the accession and cataloging system and database established for the collection. This system is to be utilized for future additions to the collection. Attachments 22 and 23 present blank copies of the Accession Record Form and the Cataloging Worksheet.

4.2.1.7 Duplicate Copies. Duplicate copies of all CRM documents and records are to be maintained in separate locations, whenever practical. This may be accomplished through either of the following means:

- Copies of BNL-generated documents provided to DOE and NYSHPO, as appropriate.
- Copies of BNL-generated documents filed in official department record files.
- Contractor-generated documents filed by contractor, BNL, DOE, and NYSHPO, as appropriate.
- Camp Upton Collection database information stored on BNL server, on CD, and print copy.

Goal. Utilize the identified systems and records to properly document existing and future cultural resource management activities.

Actions
1. Obtain official site number for WW I Camp Upton Features from NYSHPO.
2. Complete site forms for other BNL sites as appropriate.

4.2.2 NHPA Section 106 Reviews

When a review process identifies that a project has the potential to impact either a formally identified or potential historic resource, the BNL Cultural Resource Management program initiates a Section 106 Review. The Section 106 Review process includes a determination of the eligibility along with a determination of effects and any proposed mitigating actions. The determination of eligibility is based on surveys and evaluations performed by qualified individuals or organizations. Photographs, maps, and engineering drawings are included as determined necessary. Once the Section 106 Review documentation package is developed by the CRM program, it is then forwarded to DOE-BHSO for review, and concurrence. If the Review is acceptable, the package is submitted to the New York State Historic Preservation Officer electronically through the NY CRIS. The NYSHPO has 30 business days, from the date of receipt, to review and comment. The requirements and guidance specified in the following references are utilized as the Section 106 process for BNL: ACHP and UN Reno 2000, Bernstein et al. 2003, and 36 CFR Part 800.

Section 106 review packages performed to date are identified in Attachment 10. Attachment 11 identifies the location of buildings reviewed under NHPA Section 106.

4.2.3 Process for Listing Properties on the National Register of Historic Places

In the absence of an established process, the following approach should be followed to formally nominate a property for listing on the National Register of Historic Places,

Develop a draft nomination form using the National Register Bulletin *Guidelines for Completing National Register of Historic Places Forms* (NPS 1997)

Obtain BNL management and DOE-BHSO concurrence to proceed.

Coordinate with the local DOE office to determine the proper protocol (e.g., either submission of the nomination package through the DOE Federal Preservation Officer or through the SHPO), and next steps in the process.

4.2.4 Archeological Methods

The information presented in this section is derived from CRM projects CRM-2003-01 (Bernstein et al. 2003), and CRM-2003-2 (Merwin 2003). These two reports were developed to serve as guidance documents and references for BNL's Cultural Resource Management Program.

4.2.4.1 Archeological Field Survey Requirements. In 2001, a general assessment of the sensitivity for the presence of prehistoric and historic period archeological sites at BNL was performed by the Institute for Long Island Archeology at SUNY Stony Brook University (Bernstein and Merwin 2001). In 2003, an assessment of BNL's archeological field survey requirements was performed. Based on these reports, archeological surveys are recommended prior to initiating excavation actions if ground-disturbing activities are planned for the following areas:

A. Areas in the immediate vicinity of fresh water sources at BNL (property within or adjacent to wetlands and other fresh water sources, especially near the Peconic River). These areas are identified in Attachment 34, Archeologically Sensitive Areas (Merwin 2003).
B. Areas within the footprint of World War I-era Camp Upton, the Civilian Conservation Corps period, and World War II-era Camp Upton that have not had major disturbance. These areas are identified in Attachment 34, Archeologically Sensitive Areas (Merwin 2003).
C. Areas in the vicinity of nineteenth-century house sites. These areas are also identified within Attachment 34.

Large portions of the BNL property have been thoroughly disturbed by post-1946 building demolition and construction, excavation for below-ground utilities and facilities, and other earth-moving activities. Disturbed areas have a very low sensitivity for the presence of intact archeological deposits. Therefore, actions planned in the areas identified in Figure 4.2-1, Areas of Substantial Ground Disturbance, do not require an archeological survey (Merwin 2003).

4.2.4.2 Archeological Field Survey Methods. When it is necessary to conduct an archeological field survey, the standards developed by the New York Archeological Council (NYAC) are to be followed whenever practical (NYAC 2000). These standards are summarized below.

Phase I Survey: The primary goal of a Phase I archeological survey is to locate all prehistoric or historic period sites within a project area. The initial part of a Phase I survey involves a literature search and sensitivity assessment to evaluate the overall potential of the project area for the presence of cultural resources. Bernstein and colleagues (2003) provide specific examples of typical activities involved in this stage of investigation. Field methods used to identify sites include surface survey, subsurface testing, and remote sensing. Shovel test pits (STP) are the most common technique used for initial subsurface testing. Merwin (2003) describes specific spacing guidelines for performing STP based on the archeological sensitivity of the area.

Phase II Survey. The purpose of a Phase II evaluation is to obtain detailed information on integrity, limits, structure, function, and the cultural and historical context of an archeological site in order to determine if it is eligible for listing on the National Register of Historic Places. Typically, a Phase II survey involves excavating a series of closely spaced shovel test pits to precisely define the extent and limits of the site, and a number of larger units (1 x 1 meter or larger) to ascertain the contents and integrity of the site. Merwin (2003) presents additional detail with regard to conducting Phase II surveys. Attachments 24, 25, and 26 are copies of Archeological Field Forms that are to be used to record information obtained.

Phase III Data Recovery. Phase III data recovery is required when an archeological site that is listed on, or eligible for, the National Register is slated for impact from the proposed project and avoidance is not possible. The goal of a data recovery is to mitigate the direct impact of proposed construction by intensive excavation in the portion of the site that will be destroyed. A research design (data recovery plan) must be approved by the New York State Historic Preservation Officer and other involved agencies (i.e., the Department of Energy and/or the Advisory Council on Historic Preservation) prior to any Phase III items, "a detailed discussion of the research topics and questions to be addressed; the types of data that must be gathered in order to address these questions" and "strategies and methodology for recovery of the necessary data." Fieldwork and excavation procedures are generally the same as those outlined for Phase I and II investigations (Merwin 2003).

If Phase II and Phase III investigations do not reveal physical evidence believed to exist at a site, then archeological monitoring should be performed during the initial stages of construction. If human remains are encountered, archeological excavation and/or construction work is stopped, the site is secured, and appropriate local and state agencies are contacted immediately. In cases where cultural resources that are not eligible for listing on the state or national register are slated to be destroyed by construction, BNL staff may remove objects from the site just prior to demolition. Although some objects may not have archeological significance, they may have value for display or teaching (Merwin 2003)

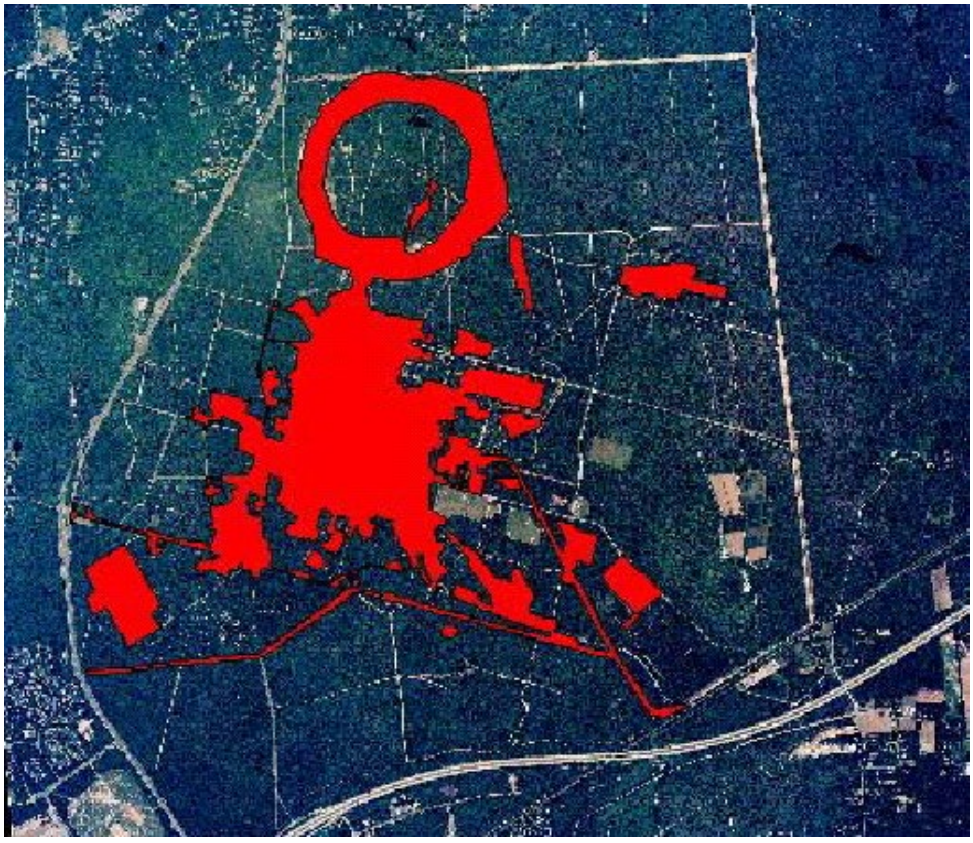

Figure 4.2-1 Areas of Substantial Ground Disturbance

4.2.5 Laboratory Treatment and Curation

Based on CRP-2003-01, "there does not appear to be a need for BNL to establish its own laboratory for the treatment and study of cultural materials" (Bernstein et al. 2003). To date, artifacts collected during CRM studies have been treated by organizations qualified to perform these actions—the same organization that performed the study. This practice is expected to continue. Before conducting any future treatment or study activities, BNL would seek direction from a qualified organization.

Curation management of the Camp Upton Historical Collection will follow the systems established during CRP-2002-03 (Czarniecki et al. 2002, 2003).

The Curation standards found in *the New York Archeological Council Standards for Cultural Resource Investigations and the Curation of Archeological Collections in New York State* will be followed to the extent practical, resources permitting. The following document includes basic information on conservation techniques, identifies additional information resources, and may be used as a technical reference: *Conservation Basics for the 4th Conference on Partnership Opportunities for Federally Associated Collections* [Canada] (FSRAAC 2002). In addition, BNL will seek outside technical guidance on collections management issues from qualified sources such as the Suffolk County Historical Society.

Materials that can be classified as federal archeological items are to be treated and curated in accordance with 36 CFR Part 79 requirements.

5.0 CULTURAL RESOURCES MANAGEMENT PROCEDURES AND ADMINISTRATION

5.1 NHPA COMPLIANCE PROCEDURES

The following procedures relate to project reviews, the NHPA Section 106 process, resource identification, and the cultural resource management program. The most current copies of these procedures are provided as attachments to this plan.

BNL SBMS subject area: NEPA and Cultural Resource Reviews. This web-based procedure describes when a review under NEPA is required, how it is initiated and processed, and includes links to the NEPA form and the designated point of contact. Reviews for potential impacts to cultural resources are incorporated into the NEPA review process. The process associated with performing an NHPA Section 106 review is described in Section 4.2.2 of this plan.

RC-SOP-500. BNL Historical Resource Identification Tag Program. This procedure describes implementation of the BNL Historical Resource Identification Tag system. The scope includes identification, application, tracking, and expectations associated with the program. Historical resources encompassed by this tagging program primarily include items that could be physically relocated. Very large items, buildings, and sites may be tracked through other means identified in the BNL Cultural Resource Management Plan (for example, by listing in the CRMP). The primary reasons for tagging these items are to identify them as significant or supporting resources, acknowledge responsibility, and reduce potential for inadvertent loss or disposal.

RC-SOP-501. Project Reviews for Potential Impact to Cultural Resources. This procedure describes the processes followed to review BNL projects in order to assess their potential to impact on-site cultural resources. The scope includes descriptions of the mechanisms used to initiate the reviews, cultural resource aspects to be considered, and management tools used to assist these evaluations.

5.2 ARPA COMPLIANCE PROCEDURES

Specific procedures applicable to requirements of the Archaeological Resource Protection Act have not been developed. When the need for an archeological permit is identified (i.e., excavation of resources >100 years old requested by or performed for non-BNL/DOE organizations), environmental programs personnel coordinate directly with the DOE-BHSO to issue the permit. Attachment 32, Application for a Federal Permit under the Archeological Resources Protection Act, is a copy of the form that may be used to initiate the archeological permit process.

The need for Archeological Permits is identified through the NEPA process in coordination with the Section 106 Process. Additionally, BNL utilizes a digging permit system for any surface penetrations greater than six inches, and Facility and Operations utilizes the 500A form to manage major projects which allows for both NEPA review and historic preservation review of projects where need for archeological surveys would be identified.

5.3 AIRFA, NAGPRA AND TREATY COMPLIANCE PROCEDURES

None required to date (see Section 3.5 Legal Compliance).

5.4 36 CFR PART 79 COMPLIANCE PROCEDURES (COLLECTIONS MANAGEMENT)

Section 4.2, CRM Methods, and Appendix B describe the processes or references BNL will utilize with regard to collections management.

5.5 PROTECTION PROCEDURES

Formal procedures related to monitoring and inspections have not been developed to date. Project screening processes are outlined in proceeding sections.

Action. Develop procedure(s) to address periodic monitoring and inspection of cultural resources to identify potential damage due to natural, unauthorized, or illegal actions.

5.6 CRM ADMINISTRATION

5.6.1 Staffing and Contracting

The environmental compliance program is responsible for developing and implementing the BNL Cultural Resource Management Program. The cultural resources manager is responsible for implementing all aspects associated with the Cultural Resource Management Program. Approximately one-third to one-half of their total employment responsibilities are related to cultural resource management with a significant amount of cultural resource 'needs' going unmet. These CR management-related responsibilities, defined in official BNL documents known as "R2A2s – Roles Responsibilities Accountabilities and Authorities," are detailed in Attachments 32 and 33, together with resumes for the current Natural/Cultural Resources Manager.

The primary function of the CRM program is to identify applicable regulatory requirements, develop appropriate plans and procedures, and integrate these into applicable BNL processes. Because CR personnel do not have formal education in the history/archeological field, they rely on the use of qualified contract organizations and personnel to provide the required expertise. Plans and procedures are then developed based on the resulting input. Appropriate contractor qualifications are included in statements of work for cultural resource contracts and are tailored to the specific deliverables sought through the contract (e.g., archeological expertise or architectural evaluations).

5.6.2 Training

Both BNL and the environmental compliance program strongly encourage staff to identify needed training and professional development opportunities. This level of commitment to training is demonstrated and documented in each individual's R2A2 and in the division's Business Plan. Annual Performance Evaluations also include the identification of training and professional development opportunities as a goal.

5.6.3 Quality Assurance

BNL maintains a Quality Management Office, and an individual from this program is matrixed to assist the environmental program areas. Assessments of environmental programs are typically identified in the division's annual Business Plan. NEPA and Cultural Resources programs are typically assessed on a 5-year rotating schedule and cultural resources are periodically a focal point for annual EMS Audits.

6.0 ASSESSMENT OF GOALS AND ACTIONS

An annual review will be performed to determine progress on actions items listed in Appendix D, Cultural Resources Management Plan – Action Items. The CR Manager will review prioritizations and identify possible financial needs. Actions will be scheduled based on anticipated funding levels, BNL programmatic requirements, mitigation or protection priorities, and CRMP prioritization levels. **Note**: The prioritization levels A–C found in Appendix D are designed to provide a relative ranking to the items (A = highest priority) and are not discreetly defined. Although the action items in Appendix D are currently grouped by prioritization level, they have not been prioritized with each grouping level.

Action. The Site Environmental Report will be used to document major actions accomplished under the CR program. The Site Environmental Report for the previous calendar year is published by Oct. 1 of the following year.

7.0 SCHEDULED UPDATES

Major updates to the CRMP will be done every 5 years. Minor revisions may be necessary after annual assessment of the action items. .

8.0 REFERENCES

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8.2 List of Figures

8.3 CRMP Reference Maps, Photos, and Documents

Note: CRMP reference documents include documents that require limited or restricted distribution and some that are not practical to copy. These documents are available through the CR program.

CRMP Ref. Doc. #1: Site Arial Photograph Post WW I / Pre-Fire Breaks (circa 1932)
CRMP Ref. Doc. #2: Site Arial Photograph Showing Fire Breaks (circa 1938)
CRMP Ref. Doc. #3: World War I Camp Upton Map Overlaying Current BNL Site Map
CRMP Ref. Doc. #4: World War II Camp Upton Map Overlaying Current BNL Site Map
CRMP Ref. Doc. #5: WW I Camp Upton Map Overlaying 2001 Aerial Photo of BNL Site
CRMP Ref. Doc. #6: WW I Camp Upton Map Overlaying 1934 Aerial Photo of BNL Site
CRMP Ref. Doc. #7: Civilian Conservation Corp Plantings Map of Camp Upton Site (1934)

9.0 ATTACHMENTS

Refer to Table of Contents for a complete listing of attachments.
Note: Reduced-size maps are presented as examples. The Cultural Resource staff maintains or has access to larger versions.

10.0 APPENDICES

Appendices include complete documents providing primary or supporting information and are considered integral parts of the management plan.

Appendix A The *Cultural Resources Inventory Including Archival Search, Prehistoric and Historic Period Contexts, and Archeology Sensitivity Assessment of the Brookhaven National Laboratory.* (Bernstein 2001b)

Appendix B Cultural Significance Categories Table

Appendix C Cultural Resource Management Strategy Forms

Appendix D Cultural Resources Management Plan – Action Items

Appendix A

The Cultural Resources Inventory
of the
Brookhaven National Laboratory

(Including Archival Search, Prehistoric and Historic Period Contexts, and Archeology Sensitivity Assessment)

Report on file with Cultural Resource Program and NYSHPO

CULTURAL RESOURCES INVENTORY

INCLUDING ARCHIVAL SEARCH, PREHISTORIC and HISTORIC

PERIOD CONTEXTS,

and ARCHAEOLOGICAL SENSITIVITY ASSESSMENT

of the

BROOKHAVEN NATIONAL LABORATORY

UPTON, TOWN OF BROOKHAVEN

SUFFOLK COUNTY, NEW YORK

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ABSTRACT

This report is a cultural resources inventory of the United States Department of Energy facility at Brookhaven National Laboratory (BNL). The facility is located in Upton, Town of Brookhaven, Suffolk County, New York, and consists of approximately 1,420 hectares (3,500 acres) situated east of William Floyd Parkway and south of New York State Route 25. The purpose of the cultural resources inventory is to document the prehistoric and historic period contexts for the property, and to determine the probability of the presence of previously unknown cultural resources.

Based on the results of the archaeological site file searches and a consideration of environmental features, portions of the BNL property have a high sensitivity for the presence of archaeological remains. For prehistoric resources, these include areas of the property within or adjacent to wetlands and other fresh water sources. If prehistoric materials are present, they are most likely small manifestations that may represent hunting or specialized collecting which occurred away from larger interior camps. Sections of the BNL property which are not adjacent to fresh water resources have a low to moderate potential for prehistoric archaeological sites. In addition, many portions of the BNL property have been thoroughly disturbed by twentieth century land use activities (e.g., road and building construction). Disturbed areas have a very low sensitivity for the presence of intact archaeological deposits.

The BNL property has an overall low sensitivity for the presence of historic period archaeological resources dating prior to the early twentieth century, but a moderate to high sensitivity for the presence of cultural material associated with Camp Upton. Expected historic period archaeological remains include early to mid-twentieth century deposits from World War I era Camp Upton (1917-1921, including training trenches and other earthworks potentially located throughout the entire BNL parcel), the Civilian Conservation Corps period (1934-1936), and World War II Camp Upton (1940-1946). Such early to mid-twentieth century archaeological resources would be potentially significant at local, State, and National levels.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

INTRODUCTION

This report presents the results of a cultural resources inventory of the United States Department of Energy facility at Brookhaven National Laboratory (BNL). The facility is located in Upton, Town of Brookhaven, Suffolk County, New York (Minor Civil Division 10302), and consists of approximately 1,420 hectares (3,500 acres) situated east of William Floyd Parkway and south of New York State Route 25. The study was conducted from July through September 2001 by the Institute for Long Island Archaeology, State University of New York at Stony Brook.

The purpose of the cultural resources inventory is to document the prehistoric and historic period contexts for the property, and to determine the probability of the presence of previously unknown cultural resources.

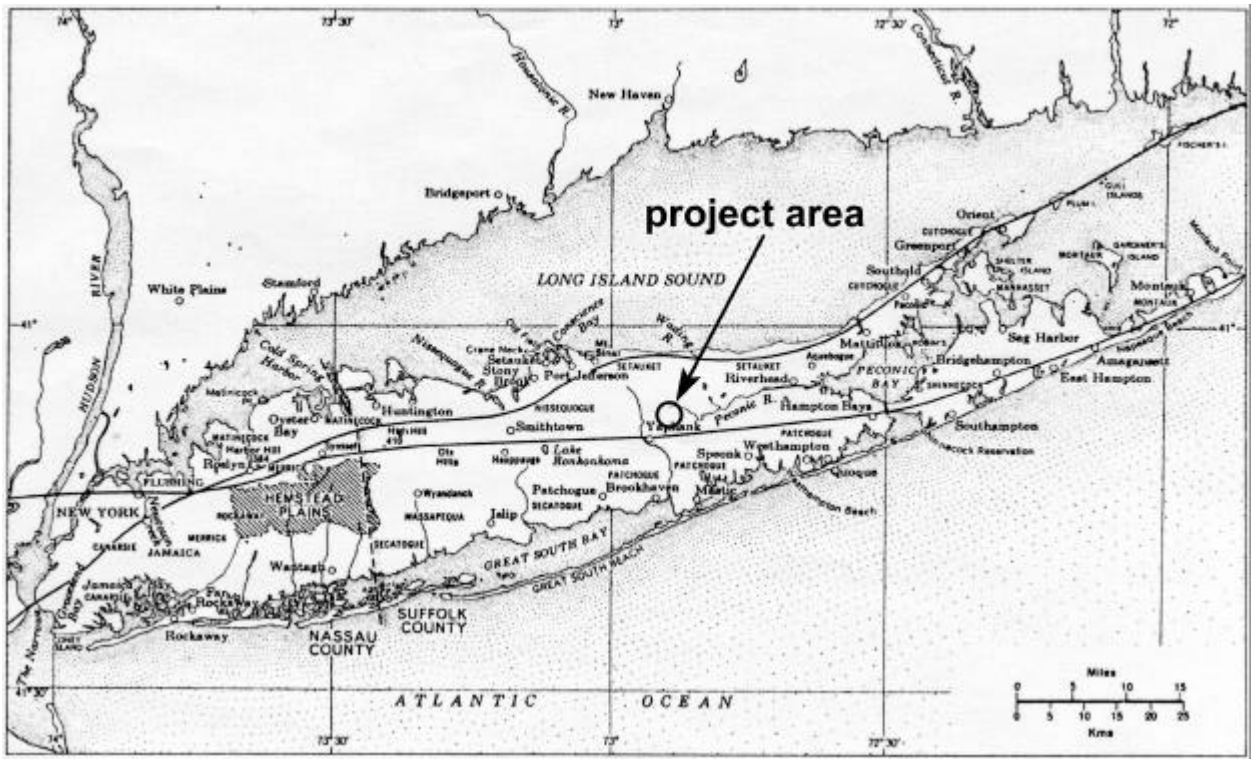

Figure 1. Map of Long Island showing the location of Brookhaven National Laboratory.

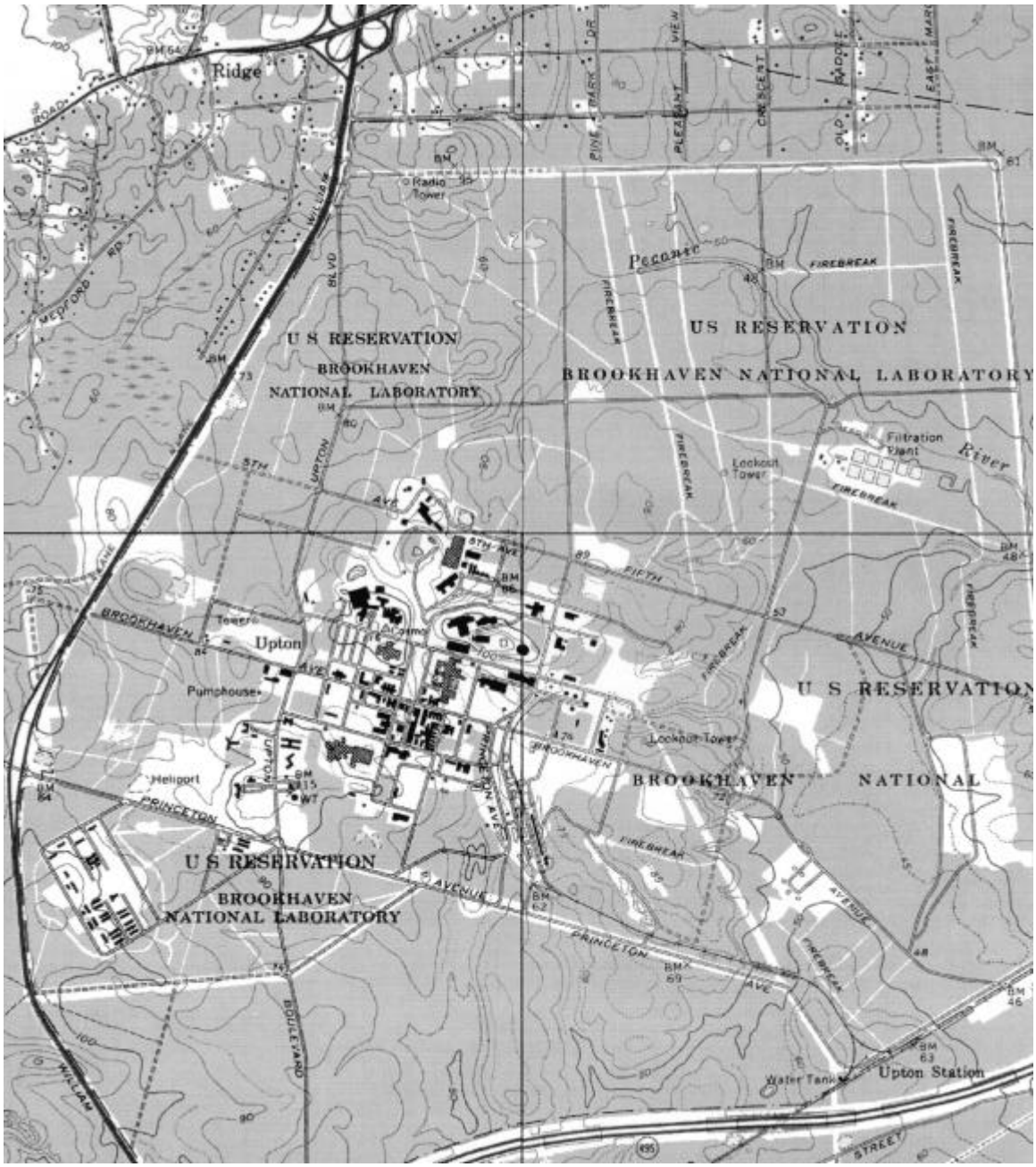

Figure 2. Mosaic of 1967 USGS topographic 7.5 minute series maps (*Bellport, New York, Middle Island, New York, Moriches, New York,* and *Wading River, New York*) (scale 1:24,000) showing the location of Brookhaven National Laboratory.

BACKGROUND RESEARCH

Introduction and Method

An evaluation of the environmental and physical characteristics of an area is essential to understanding past land use, as well as the likelihood of encountering prehistoric or historic archaeological sites. Human groups locate their settlements in order to best take advantage of the characteristics of the natural and social landscape. Thus, knowledge of a region's environmental features, as well as its history, is important for reconstructing past behavior and assessing the probability of locating evidence of early activities.

A search of the available published records and unpublished site files (on Long Island and in Albany) of known archaeological and historic sites was undertaken to determine if any previous studies had documented archaeological remains in, or in the vicinity of, Brookhaven National Laboratory. Pertinent historical records such as maps, photographs, and descriptive histories were examined to obtain information on past activities in the study parcel and surrounding region.

Environmental Setting

Brookhaven National Laboratory is located near the center of Suffolk County, approximately 96 kilometers (60 miles) east of New York City (Figure 1). It is on the Terryville outwash plain, a feature created during the last glacial period over 15,000 years ago (Sirkin 1995). The Ronkonkoma terminal moraine is just to the south of BNL. The sandy outwash plain is cut by the Peconic River Valley; the headwaters of the river are located just over one kilometer north of the most densely-built portion of the BNL complex (Figure 2).

Topography is variable over the large expanse of the BNL facility. Elevations range from a high of 40 meters above mean sea level ("Rutherford Hill," the site of the Brookhaven Graphite Research Reactor near the center of the campus) to 14 meters on the eastern periphery. Soils are dominated by Riverhead sandy loam, graded Riverhead and Haven soils, and cut and fill land (Warner et al. 1975:Sheet 57). The Riverhead series consists of deep, well-drained, medium to

coarse textured soils with low natural fertility (Warner et al. 1975:81-83).

Prior to the clearing of vegetation throughout much of the BNL property during construction of Camp Upton in 1917, the property was wooded with species typical of the central Long Island pine barrens. Large sections of the property were reforested with eastern white pine saplings by the Civilian Conservation Corps in the early 1930s. The extant woodlands surrounding the structures at BNL support a variety of wildlife.

Site File Research

The site files of the Suffolk County Archaeological Association (SCAA), the Institute for Long Island Archaeology (ILIA), New York State Museum (NYSM), and the New York State Office of Parks, Recreation, and Historic Preservation (SHPO) document five known prehistoric finds, one site with prehistoric and historic period components, and ten historic period sites within one mile (1.6 kilometers) of Brookhaven National Laboratory (Appendix). Archaeological sites are listed in Table 1.

There is one documented archaeological site on the grounds of BNL; SHPO A10302.000474, Camp Upton World War I training trenches. The site files show two general locations for these trenches, which have been determined to be eligible for the National Register of Historic Places. The remainder of the archaeological sites listed in Table 1 have been inventoried by SHPO, but these sites are either not eligible for the National Register or have not yet been evaluated.

During the mid-1970s, cultural resource investigations were performed on a part of the BNL project area (Johannemann and Schroeder 1977, 1978). The investigations were conducted at the site of the proposed Intersecting Storage Accelerator (ISABELLE), north of the existing Alternating Gradient Synchrotron (AGS) near the northwestern corner of the BNL property. In addition, Johannemann performed a surface survey near the headwaters of the Peconic River in 1974, with negative results (Johannemann and Schroeder 1977:7).

No prehistoric archaeological sites were encountered during the 1970s surveys, but twenty loci of twentieth century activity associated with World War I and II Camp Upton were identified. These features include training trenches, circular depressions for camp sites and other

military training functions, a pistol range sided by earthen berms, a mound of construction debris, and other features (Johannemann and Schroeder 1977, 1978). Some of the World War I era trenches documented by Johannemann and Schroeder appear to be those which have been determined to be National Register eligible (site A10302.000474).

Table 1. Known archaeological sites located within one mile (1.6 kilometer) of Brookhaven National Laboratory.

Site Identifier	***Site Name***	***Age/Cultural Affiliation***	***Comments***
A10302.000470	Lake Panamoka	prehistoric	surface finds of lithic artifacts, including Wading River and Orient fishtail points
A10302.000471	Tarkill Pond	prehistoric	no information provided; possibly Late Woodland
A10306.000724		prehistoric	stray find of one quartz flake
A10302.000473		prehistoric	finds from surface and one test pit include 14 lithic flakes, 34 fire-cracked rocks, and charcoal
A10306.000725		historic, 18th-19th c.	field stone foundation and well; artifacts include stoneware, whiteware, bottle glass, and nails
A10306.000726		prehistoric	stray find of one quartz tool
A10306.000727		historic, late 19th c.	brick foundation and scattered refuse
A10302.001834	Ridgeco	prehistoric and historic (late 19th-early 20th c.)	prehistoric artifacts include possible quartz debitage, cores, hammerstones, and scraper; historic period remains include field stone and concrete foundations and bottle glass
A10302.000474	Camp Upton trenches	historic, ca. 1917	NRE, two areas of trenches dug at WWI Camp Upton; it is likely that other unmapped trenches are present
A10302.000549	Camp Upton trenches and bunkers	historic, 20th c.	training trenches from WWI activity at Camp Upton observed near rifle range at Brookhaven State Park; recommended that remainder of park be surveyed for additional WWI and WWII resources
A10306.000278	Horn Tavern Farm	historic, 18th c.	site of Colonial period tavern; no visible evidence of structure
A10302.000536		historic, late 19th-mid-20th c.	farm complex; brick foundation, barnyard artifacts and household refuse midden
A10302.000472		historic	bottle glass, oyster and clam shell
A10302.000465	Weeks Octagonal House	historic, mid-19th c.	site of William Weeks' house
A10302.000469		historic, mid-19th c.	house and outbuilding site; field stone house foundation
A10302.000523	Homan mill dam	historic	early 19th century earthen dam

NATIVE AMERICAN CONTEXT

Overview of the Prehistoric Period in Southern New England

Eastern Long Island has been occupied for at least ten thousand years by ancestors of modern and historically known Algonquian speaking Native Americans. The archaeology of this portion of southern New England and southeastern New York is well-developed and has a history dating back into the last century. This work has involved cultural resource management studies, avocational excavations, and traditional "academic" endeavors. Broad regional overviews are provided in Ritchie (1980), Salwen (1978), Snow (1980), and Dincauze (1990). A recent synthesis of the relevant ethnohistoric sources is found in Grumet (1995). The historian John Strong (1997) has written a lengthy popular overview of the archaeology and history (to A.D. 1700) of Long Island Native Americans.

Archaeologists working on Long Island and elsewhere in the northeastern United States usually employ a system of three periods (Paleoindian, Archaic, and Woodland) to divide the span of time between the first settlement of the region by Native peoples and the arrival of the European explorers and colonists in the sixteenth century (for alternative temporal frameworks see Snow 1980 and Dincauze 1990). This chronological scheme is shown in Table 2.

Although much fieldwork has taken place on Long Island (especially the north shore), many questions regarding the region's prehistory remain. Interpretation has been hindered by a lack of radiocarbon dates from prehistoric Native American sites. This means that in many cases, sites and components of sites have been dated solely on the basis of artifact (especially projectile point) styles. In the Northeast, projectile points are typically classified based on considerations of form, and the contexts from which they were recovered are then assigned the absolute dates that have been obtained for similar materials in the region (Table 2). The resolution available with typological cross-dating is generally very broad and therefore not always adequate for sorting out remains into contemporary components or making comparisons among sites. It is also the case the various point types do not represent discrete temporal periods (Filios 1989) and that many of the types were used for extremely long (thousands of years)

periods of time. This is especially the case for some of the Late Archaic point types. Despite these drawbacks, artifact typologies are indispensable tools for ordering the prehistoric past, and they are used to organize the discussion that follows, except in those cases where specific radiocarbon dates are mentioned.

Since the retreat of the Late Pleistocene glaciers (circa 18,000 B.P.), the coastlines of southern New England and New York have been progressively inundated. Significant for the study of Native American archaeology is the fact that many early (pre-5000 B.P.) coastal sites are now under water. Although sea-level continues to rise today, most shorelines attained their approximate modern positions by 3000 B.P. During the last three to five thousand years of the prehistoric era (and possibly earlier), the mouths of estuaries were particularly attractive to hunter-gatherer-fishers, and many of the larger sites dating to the Late Holocene have been identified in these settings.

Table 2. Prehistoric chronology for the Long Island region.

Period	***Dates***	***Trends***
Late Woodland	A.D. 1000 - 1500	Agriculture in mainland river valleys.
Middle Woodland	A.D. 0 - 1000	
Early Woodland	700 B.C. - A.D. 0	Pottery; intensive use of coastal resources.
Terminal Archaic	1000 - 700 B.C.	Elaborate burial ritual.
Late Archaic	4000 - 1000 B.C.	Increase in number of archaeological sites; consumption of shellfish.
Middle Archaic	6000 - 4000 B.C.	Modern flora and fauna.
Early Archaic	8000 - 6000 B.C.	
Paleoindian	10,500 - 8000 B.C.	Fluted projectile points.

The Paleoindian period (Table 2) dates from the first arrival of humans into the region until around 8000 B.C. Settlement here, like all of the Americas, took place at the end of the Pleistocene glacial epoch as human populations radiated out from Asia across the exposed Bering Sea land bridge and/or by boat across the northern Pacific (see Meltzer 1988 for a synthesis of data pertaining to the early peopling of eastern North America). As discussed further below, very few sites dating to this period are known from the Long Island region, although the presence of early peoples is implied from the occasional find (almost always on the surface) of characteristic fluted projectile points that were presumably used to hunt Late Pleistocene/Early Holocene fauna (Merwin 2000; Saxon 1973). The lack of early sites along the modern coast is to be expected. Even if the region was well-populated prior to 8000 B.C., most of the evidence for early human presence has been destroyed or hidden by a series of natural forces. Foremost among these forces is the post-glacial rise in sea-level. During the initial settlement of the region, sea-level was over one hundred meters lower than today, meaning that, for example, the south shore of Long Island was located as much as one hundred miles (160 kilometers) south of its present position (Sirkin 1995). What is now Long Island Sound was not a marine ecosystem, but rather a freshwater glacial lake that eventually burst through the moraine behind which it was dammed, and drained into the Atlantic Ocean. Thus the environment settled by the earliest inhabitants of Long Island Sound was not coastal in the modern sense.

After the retreat of the glacial ice sheet, tundra vegetation, similar to that found today in Alaska and northern Canada, colonized newly exposed Long Island (Sirkin 1996). Between nineteen and eleven thousand years ago, a spruce dominated forest was present, to be followed by a forest dominated by pine. Finally, by nine thousand years ago (probably during the Early Archaic period [Table 2]) hardwood forests, similar to those that characterize the Eastern Woodlands today, began to develop on Long Island.

The Archaic period is characterized by the gradual development of more-or-less modern environmental conditions. Humans adapted to the abundant resources provided by interior woodlands, ponds, and rivers, as well as coastal estuaries by exploiting a broad range of food (nuts, large and small game, seed-bearing plants, fish, etc.) and industrial products (stone for making tools and weapons, plants for baskets and textiles, bark for house construction, etc.). By

5000 B.C. the region was heavily settled, with populations for the southern New England coast and offshore islands possibly numbering in the thousands. Archaeological evidence of this apparent population "explosion" is reflected in the enormous number of archaeological sites dating to this period, and by the size of the individual settlements, many of which exceed five hectares (12.4 acres). A number of these large Archaic settlements or villages have been discovered on the north shore of Suffolk County, approximately eight kilometers north of Brookhaven National Laboratory.

Archaeologically, little behavioral change is observable during the Woodland period on Long Island. Some artifact forms are altered (e.g., projectile point shape) and pottery seems to be increasingly important over time, but the long-established economic pattern of the exploitation of a broad range of natural resources continues. During the Late Woodland (circa A.D. 1000-1500) agriculture, especially the growing of corn and beans imported from the American tropics, becomes important in the economies of native groups living along the middle and upper reaches of the major river valleys (e.g., Hudson, Connecticut, Housatonic) in upstate New York and Connecticut. The importance of agriculture on the mainland coast and Long Island is still not well known, and is a topic much debated by archaeologists (Bendremer and Dewar 1994; Bernstein 1993; Ceci 1979, 1982; Lavin 1988; Silver 1981). Regardless of the importance of cultivated foods like corn, beans, and squash in the diet, it is clear that Native peoples on the coast continued to hunt, gather, and collect the abundant products of the natural environment. This strategic use of a diverse range of available resources characterized many native economies into the present century.

Prehistoric Context: Central Suffolk County

Eastern Long Island, including central Suffolk County and the region around Brookhaven National Laboratory, was probably first settled sometime prior to 10,000 years ago, after the retreat of the last Pleistocene glacier. Long Island was ice-free by 20,000 years ago (Sirkin 1995), however, the region was not suitable for human habitation until thousands of years later. The date of the first arrival is not known, and due to the dynamics of local geology will probably never be ascertained with any certainty. No sites dating to the Paleoindian period (Table 2) have

been excavated on Long Island, but numerous characteristic fluted projectile points have been recovered (Gwynne 1982:39-40; Merwin 2000; Saxon 1973). Aside from these isolated surface finds and pieces that occasionally appear in private artifact collections, no substantial evidence of the earliest inhabitants of Long Island is present anywhere in the region.

Intensive occupation of Long Island by Native peoples began during Late Archaic times (roughly 4000-1000 B.C.). Sites dating to this period are often very large and contain dense and diverse quantities of artifactual materials. Further, they frequently contain great numbers of features such as pits, hearths, and post molds that also indicate a sizable Native American presence. Analysis of faunal materials suggest that populations were probably rather sedentary, living in fixed settlements for most of the year (Gwynne 1982). "Small-stemmed" projectile points (cf. Ritchie 1971), referred to as Wading River, Squibnocket, or Lamoka types are very common at Long Island sites dating to the traditionally-defined Late Archaic, although they are also sometimes found in association with ceramics.

On Long Island and elsewhere in the coastal Northeast, the Woodland period is typically identified by a single characteristic, ceramics. Coastal shell middens increase in frequency on Long Island during the Woodland period, and many of these have been studied in detail (Lightfoot 1988).

Site file listings at the New York State Office of Parks Recreation and Historic Preservation (SHPO), the New York State Museum (NYSM), and the Institute for Long Island Archaeology at SUNY Stony Brook indicate the presence of numerous Native American sites in the general vicinity of Brookhaven National Laboratory. Most of these are located near the Wading River estuary, approximately eight kilometers north of the project area, including the Wading River I and II localities (NYSM 5589 and SHPO A10302.000503), Shoreham I and II (NYSM 5592 and SHPO A10302.000506), Cusano (NYSM 5588), Split Rock (NYSM 5587), Riverview (NYSM 5591), and St. Joseph's Villa (NYSM 5593) locales on the western flanks of the Wading River marshlands (Ritchie 1959; Wyatt 1977).

Based on artifact typology, most of the Wading River sites appear to be multi-component (Late Archaic through Woodland periods). None of the sites seem to cover much more than an acre, and most contain shellfish remains (hard and soft clams, scallop, and oyster are the most

common) along with pieces of bone from a variety of food species (e.g., deer, turtle, bird) and an occasional charred nut shell (e.g., hickory). In addition to the food refuse, the Late Archaic sites at Wading River yielded a broad array of lithic artifacts, most of which were made from locally abundant quartz cobbles. Numerous pit features (presumably used for cooking, storage, and/or refuse disposal) were excavated at Wading River, as were concentrations of fire-cracked rock and several hearths. This configuration of remains (bivalve shell, bone preserved in the shell matrix, pit features, concentrations of fire-cracked rock, tools and detritus from quartz cobble reduction) is typical of Late Archaic and Woodland sites on the north shore of Long Island.

The frequency of known sites deceases south of the Harbor Hill Moraine, but scattered loci of prehistoric activity have been encountered. The Kurovics Farm site, a light surface scatter of lithic material (SHPO A10302.000021; Billadello and Johannemann 1987) is located approximately six kilometers north of BNL. Although the landowner has reported finding artifacts on the property, no prehistoric materials were found during subsurface testing performed during a cultural resource management survey (Billadello and Johannemann 1987). The Lake Panamoka site (SHPO A10302.000470), nearly four kilometers north of BNL, is reportedly an extensive Late Woodland site on the western side of this large kettle pond. All over Long Island, kettle ponds such as Lake Panamoka were attractive settings to prehistoric peoples. Southwest of Lake Panamoka is the Tarkill Pond site (SHPO A10302.000471), on the grounds of Brookhaven State Park. The site (Table 1) possibly dates to the Late Woodland period.

Further to the south, “stray finds” are reported for sites A10306.000724 (one quartz flake) and A10306.000726 (one quartz tool) that were identified during a survey of Peconic River County Park (Johannemann and Schroeder 1980a)(Table 1). Both of these finds are located slightly less than two kilometers east of BNL.

The RidgeCo site (A10302.001834), a mixed historic and prehistoric site (with only lithics recovered), is located approximately 1.7 kilometers west of BNL, on the north side of Middle Country Road (Tracker 1996). Among the possible artifacts reported are quartz debitage (waste flakes produced during stone tool manufacture and/or resharpening) and cores, a scraper, an abrader, a mortar, and hammerstones.

Four prehistoric sites (designated with the SHPO numbers A10302.000473 and A10302.000524 in the site files and as Sites 3-22, 3-18A, 3-18B, and 3-24 in the technical report) are reported along the Carmans River in Southaven County Park (Johannemann and Schroeder 1980b). One of these sites, A10302.000473, is located just over one kilometer southwest of BNL (Table 1).

Comparatively little is known about prehistoric settlement and subsistence patterns for the interior reaches of Long Island, as attention has traditionally focused on the island's coast (Lightfoot 1988). This bias may be seen in the Suffolk County Archaeological Association's Cultural Resources Inventory (Gonzalez and Rutsch 1979), where much of the interior portion of the county (including the project area) is characterized as an area "of low activity or insufficient data." The results of some preliminary studies suggest that many sites located away from the coast are "short duration camps or procurement stations" (Lightfoot 1988:38). These are sites where a limited ranges of activities were performed (such as hunting, nut collecting, or lithic raw material procurement), and their archaeological assemblages frequently contain a low diversity of artifactual remains.

The lack of attention given to small interior sites has serious implications for the understanding of regional patterns of settlement and resource use. In order to fully understand the nature of prehistoric settlement patterns on Long Island and other coastal areas, it is necessary to consider samples from a wide range of sites.

Archaeological research suggests that prehistoric hunter-gatherers on Long Island engaged in relatively low residential mobility (cf. Binford 1980); coastal habitation sites appear to have been occupied for months or even years before abandonment by the entire group. The frequency and importance of logistical mobility, where individuals or small task-specific groups made forays from the residential base to procure resources, is less clear. Part of the problem in understanding how the interior influenced coastal hunter-gatherer settlement, subsistence, and even social patterns, has been the perception that the interior of Long Island was lacking in useful natural resources.

Much of the central portion of eastern Long Island, including the BNL property, consists of pine barrens communities. These habitats range from oak-dominated oak-pitch pine forest, to

pine-dominated pitch pine-oak forest, pitch pine-oak heath woodlands, dwarf pine plains, and pitch pine-scrub oak barrens (Reschke 1990). The plant communities within the pine barrens ecosystem thrive on sandy, dry, acidic, nutrient-poor soils, and typically can withstand drought and fire.

One problem with understanding prehistoric adaptation in the pine barrens concerns the origins of this ecosystem; specifically, whether or not the pine barrens of Long Island pre-date European arrival and occupation during the mid-seventeenth century (for details of this debate, see Hamilton 1998). Human activity can have a profound effect on the landscape. In the case of the pine barrens, fire is among the most important factors for determining the spatial extent of fire-favored pitch pine at the expense of deciduous trees.

Aboriginal use of fire for clearing and to create grazing areas is documented elsewhere in southern New England (Cronon 1983), but some researchers have suggested that Native American populations were too low on Long Island to have had any net effect (Turano 1983). Instead, they cite Euro-American exploitation (over-harvesting desirable hardwood species) and technology (the opening of railroad lines in the 1840s resulted in regular brush fires caused by sparks from passing trains) as responsible for the modern dominance of pine in this ecosystem (Turano 1983). However, early documents such as the 1734 *New England Coasting Pilot* clearly indicate the center of the island was "barren land" prior to significant Euro-American utilization. Pollen studies also support the interpretation that modern pine barrens are analogous to prehistoric pitch pine-oak forests that occupied the outwash plain in the center of Long Island since at least eight thousand years ago (Sirkin 1995).

The concept that the pine barrens are economically unproductive seems to reflect Euro-American values, where the usefulness of land is directly linked with its agricultural capability. Despite this perception, almost every type of patch in the pine barrens mosaic has useful natural resources (Villani 1997). Mammals including white-tailed deer, squirrel, raccoon, possum, fox, rabbit, and woodchuck, birds such as wild turkey and grouse, and reptiles like box turtle and black snake are abundant. Economically important plants found in large patches include blueberry, and nut-bearing trees such as oak and hickory. Of course, the presence of such resources does not necessarily mean that they were utilized by hunter-gatherers. However,

analysis of coastal sites with good organic preservation suggests a broad subsistence base for Native peoples in this region.

Among the most productive settings in the pine barrens ecosystem are the kettle and coastal plain ponds that dot the eastern Long Island landscape. Besides potable water, these ponds offered a dense concentration of animal and edible plant species. The results of academic and cultural resource management studies indicate that, much like their coastal counterparts, the location of interior prehistoric sites appears to be heavily influenced by the close proximity of a freshwater source (Bernstein et al. 1996).

To date, only one large prehistoric site which resembles contemporary coastal residential bases has been identified in the pine barrens, the Twin Ponds site (Lightfoot 1988), located approximately six kilometers northwest of Brookhaven National Laboratory. Named for its location around two kettle ponds, this site contained pit features, concentrations of fire-cracked rock, and post-molds interpreted as house remains. Artifacts include projectile points and other bifacially-worked lithic tools, hammerstones, cores, lithic waste flakes, stone pestles, ceramics, and marine shell. Temporally-diagnostic stone tools are indicative of multiple occupations of the site over at least two thousand years.

Both the density and diversity of remains suggest that Twin Ponds was a residential camp from which families were able to readily exploit resources of the Long Island interior. Activities represented in this assemblage include house construction, cooking, stone tool production and maintenance, hunting, butchering, and plant processing.

The Twin Ponds site is markedly different from most other known sites in the pine barrens of eastern Long Island. More typical are comparatively small manifestations of prehistoric activity that are best interpreted as sites where a limited range of tasks were performed. This is reflected in archaeological assemblages which frequently contain a low diversity of artifactual remains. For example, a preliminary archaeological survey of the former Naval Weapons Industrial Reserve Plant in Calverton (approximately seven kilometers northeast of BNL) discovered two small prehistoric hunting stations located directly adjacent to fresh water ponds, while only one artifact was recovered from all test areas that were more than 100 meters from a pond or stream (Historical Perspectives 1996). Other regional surveys have identified

very small manifestations of prehistoric activity distant from any fresh water source. These manifestations, usually one to five artifacts, represent activities such as tool maintenance, loss, or discard that took place away from the main camps. These seemingly isolated finds are probably the most prevalent type of evidence of prehistoric activity found on Long Island (Bernstein and Lenardi 2001).

In summary, recent archaeological research suggests that the pine barrens of eastern Long Island were utilized by hunter-gatherers as part of a regional subsistence and settlement pattern. The foundation of this pattern is a broad subsistence base, encompassing diverse coastal and interior resources. The results of preliminary surveys suggest that a large number of sites located away from the coast are camps or stations that were used for short durations and for a limited range of activities, as reflected by frequently small assemblages with a low diversity of artifact types. Based on a consideration of environmental features, the results of site file searches, and previous archaeological research on eastern Long Island, Brookhaven National Laboratory, especially sections containing fresh water resources (e.g., the headwaters of the Peconic River), has a moderate to high sensitivity for the presence of prehistoric deposits.

HISTORIC PERIOD CONTEXT

Pre-World War I

Permanent settlement by the English did not occur in central Suffolk County until the late seventeenth century. At the time of contact, the region was occupied by the Secatogue and Unquachog Indians, both speakers of the Mohegan-Pequot-Montauk Algonquian language (Salwen 1978). According to an early historian (Thompson 1839), the division between the deciduous forests on, and north of, the Ronkonkoma terminal moraine and the scrub oak and pitch pine barrens of the glacial outwash plain to the south also marked a cultural boundary between Native American groups (with the Secatogues to the north and the Unquachogs to the south).

By the time of European arrival there was little conflict as local Native Americans were already weakened by disease and from raids by the mainland Connecticut tribes. While there was constant fear of attack, there was little actual violence (Bayles 1874:4), and prime land and local power quickly passed to the white settlers. However, the Ryder Survey of 1670 refers to the southern two-thirds of present day Suffolk County only as "Sachem Land." This suggests that residual Native American groups may have continued to live throughout the region at least until the end of the seventeenth century.

The lands of present-day Town of Brookhaven were ceded from the Native Americans in a series of deeds dating from 1655 to 1677 (Hazelton 1925). A huge parcel in the interior of the Town of Brookhaven near its eastern border (including the BNL property) was purchased from representatives of the Secatogues by Colonel William Smith in 1691. However, there is no documentation of English occupation in the interior portion of Brookhaven until the eighteenth century. Instead, the earliest English settlements were generally located along the coastline of Long Island, at places such as Wading River, approximately eight kilometers north of the project area.

English settlement in the interior of Brookhaven township commenced in earnest after the division of lands along Middle Country Road (New York State Route 25, north of the main

section of BNL) was voted upon in 1730 (Bailey 1949). The earliest recorded Euro-American settlement in the vicinity of BNL dates to 1728, when Stephen Randall established a farm in the nearby hamlet of Ridge (Bayles 1874).

Several roads connecting coastal villages of the north and south shores of Suffolk County were established in the late seventeenth and eighteenth century (Bailey 1949). However, it was the advent of the railroad, and later the automobile, which irrevocably changed the nature of the interior reaches of the county. The railroad provided an economical means of transporting both people and bulk goods. By 1844, trains on the Brooklyn-Greenport line were running regularly near the southern edge of the BNL property. Settlement of the interior reaches of Suffolk was facilitated (as well as encouraged) by the railroad. In the early twentieth century, a spur from the main railroad line was built to facilitate the World War I era construction of Camp Upton (see below).

Little changed in the lifeways of the Euro-American colonists of Suffolk County until the American Revolution. Early in the conflict Long Island attracted British attention because of the island's proximity to the major port of New York Harbor, and also to Connecticut and Rhode Island. In addition, Long Island was used as a major resource for provisioning British troops, and the local agrarian economy was disrupted as the British stripped the region of food, timber, and herd animals (Luke and Venables 1976).

Industry and water-borne trade were interrupted with British occupation of Suffolk County, but life gradually returned to the earlier pattern after 1781. Following the Revolution and into the mid-nineteenth century, the settlement of the interior regions of the Town of Brookhaven proceeded slowly and was concentrated along main thoroughfares such as Middle Country Road (New York State Route 25). Developing communities formed a linear farming district surrounded by forests, well-situated to utilize this important overland east-west stage route. Most early structures in Ridge were located on the north side of Middle Country Road, the southern boundary of the Colonial "Great Lots" which extended from Long Island Sound in the north to the middle of the island. By the 1870s, Ridge was "a scattered settlement of a dozen houses... in the midst of woodland" (Hazelton 1925:818).

Population growth continued slowly during the late nineteenth and early twentieth century, while the linear settlement pattern along Middle Country Road was maintained. Following World War II, housing developments were built as the population in eastern Brookhaven Town increased dramatically and farming diminished in economic importance.

Brookhaven National Laboratory is bounded on the north and west by the hamlet of Ridge, on the north by Brookhaven State Park, on the east by Peconic River County Park, and on the south by the hamlet of Yaphank. As mentioned above, the first recorded settlement at Ridge dates to 1728, when Stephen Randall established a farm on Whiskey Road (Bayles 1874). Stephen Randall gained local fame during the American Revolution when he organized a company of minutemen to defend area homesteads against the Crown. Ridge is identified on some early maps as "Randallville," since most early residents belonged to this family. The community was also known as Ridgeville or Ridgefield prior to the opening of the post office in 1949. The name Ridge is for the prominent geological feature on the north side of the hamlet (*Newsday* 1998:H95).

The site files contain information on one known historic period archaeological site in Ridge less than two kilometers from BNL. The RidgeCo site (SHPO A10302.001834) has a late nineteenth to early twentieth century component (mainly building foundation remains). In addition, the Randall House and Randall Cemetery (SHPO 10302.000940 and 10302.000941) are standing west of William Floyd Parkway on Whiskey Road, and the National Register listed eighteenth century Smith Estate "Longwood" is west of William Floyd Parkway on Longwood Road, both opposite BNL property.

Brookhaven State Park was originally part of Camp Upton and the Upton National Forest, as the large tract was known during the period between the world wars. The parcel became state parkland in 1971, but remains largely undeveloped except for a few roads and a rifle range. The park has been inventoried by the Office of Parks, Recreation, and Historic Preservation (SHPO 10302.001878), and found to be ineligible for the National Register. There is one documented historic period archaeological site in Brookhaven State Park, trenches possibly from World War I activity at Camp Upton observed near the modern rifle range in the park (SHPO A10302.0000549). The site inventory form indicates the high likelihood for the presence of

additional Camp Upton resources within unsurveyed portions of Brookhaven State Park. However, it is possible that the trenches in Brookhaven State Park may have served a function other than World War I Army training, as this tract is not shown as part of Camp Upton on pre-1920 maps (see below).

The headwaters of the Peconic River originate near Peconic River County Park, and the availability of fresh water and associated wetlands resources undoubtedly attracted prehistoric hunter-gatherers as well as later Euro-Americans. The most significant historic period land use in the park was the cultivation of cranberries. During the late nineteenth century, Suffolk County was the third largest producer of cranberries in the country, and the coastal plain ponds of the Peconic headwaters provided an ideal growing environment. The cranberry industry in Suffolk County began to decline in the 1930s, when competition from larger bogs in Massachusetts and New Jersey lowered market prices, and fireworm infestations ruined the Long Island crops (Johannemann and Schroeder 1980c).

There are three historic period archaeological sites reported as being in or adjacent to Peconic River County Park. The Horn Tavern Farm site (SHPO A10306.000278) is known through documentary sources; there is no evidence of this Colonial period tavern building on the ground surface, and no subsurface testing has been conducted to investigate the integrity and research potential of the site. The other two sites both consist of late nineteenth through twentieth century brick foundations with associated domestic refuse (SHPO A10306.000727 and A10302.000536).

The small rural community of Yaphank was established in the mid-eighteenth century as Millville (the name was changed when the post office opened in 1845). Yaphank witnessed a local development mini-boom following the opening of the railroad. Several community structures were constructed in the early 1850s. By the 1870s, Yaphank was a thriving village with two grist mills, two lumber mills, two blacksmith shops, and two wheelwright shops, as well as a lumber yard, a printing office, an upholstery shop, and one general store. The village was also home to two doctors, a cobbler, a dressmaker, and a butcher (Bayles 1874).

Besides the milling industry, agriculture also played an important role in the early economy of Yaphank. The Suffolk County Poor Farm was established in 1870 to provide food

and shelter for indigent residents of the county. The 170 acre tract of "excellent quality" level land (Bayles 1874:257) located slightly less than two kilometers southwest of BNL is currently operated by the Cornell Cooperative Extension as the Suffolk County Farm and Education Center. The Suffolk County Poor Farm is significant as a social welfare institution, and also as a well-preserved rural landscape.

Yaphank's growth was slowed at the beginning of the twentieth century, when competition from inland grain producers and the introduction of electrically-powered mills rendered the hydro-powered mills of the village obsolete. Many local businesses closed, though houses and farms remained. The hamlet witnessed little growth during this century, resulting in the preservation of several early structures. Yaphank's Main Street was designated a Brookhaven Town historic district in 1985 (SHPO 10302.000029). The extension of the Long Island Expressway (I-495) to Exit 67 in Yaphank during the 1970s has had some impact upon the rural quality of the village.

The closest known historic period archaeological sites in Yaphank are clustered around the Carmans River, and consist of mid-nineteenth century house remains (SHPO A10302.000465 and A10302.000469), a refuse scatter of bottle glass and shell (SHPO A10302.000472), and the early nineteenth century Homan Mill earthen mill dam (SHPO A10302.000523).

A survey of late eighteenth through early twentieth century maps suggests that the Brookhaven National Laboratory property witnessed minimal use other than possible hunting, cordwood harvesting, and agriculture until the twentieth century. The 1797 Hulse *Survey of the Town of Brookhaven* (Figure 3) shows much of east-central Brookhaven as open space, "Barren Sruboak Land" west of the headwaters of the "Peaconick River." The dirt road illustrated between Wading River on the North Shore and the mills at Yaphank to the south approximates the courses (north to south) of modern Ridge Road, Raynor Road, Smith Road, and Longwood Road, all west of modern William Floyd Parkway. The closest structures to the project area on the 1797 map are the Randall House on Middle Country Road in what is now Ridge, Horn Tavern, a structure depicted at the north end of "Long Pond" (now Lake Panamoka), and mills along the Carmans River at Yaphank.

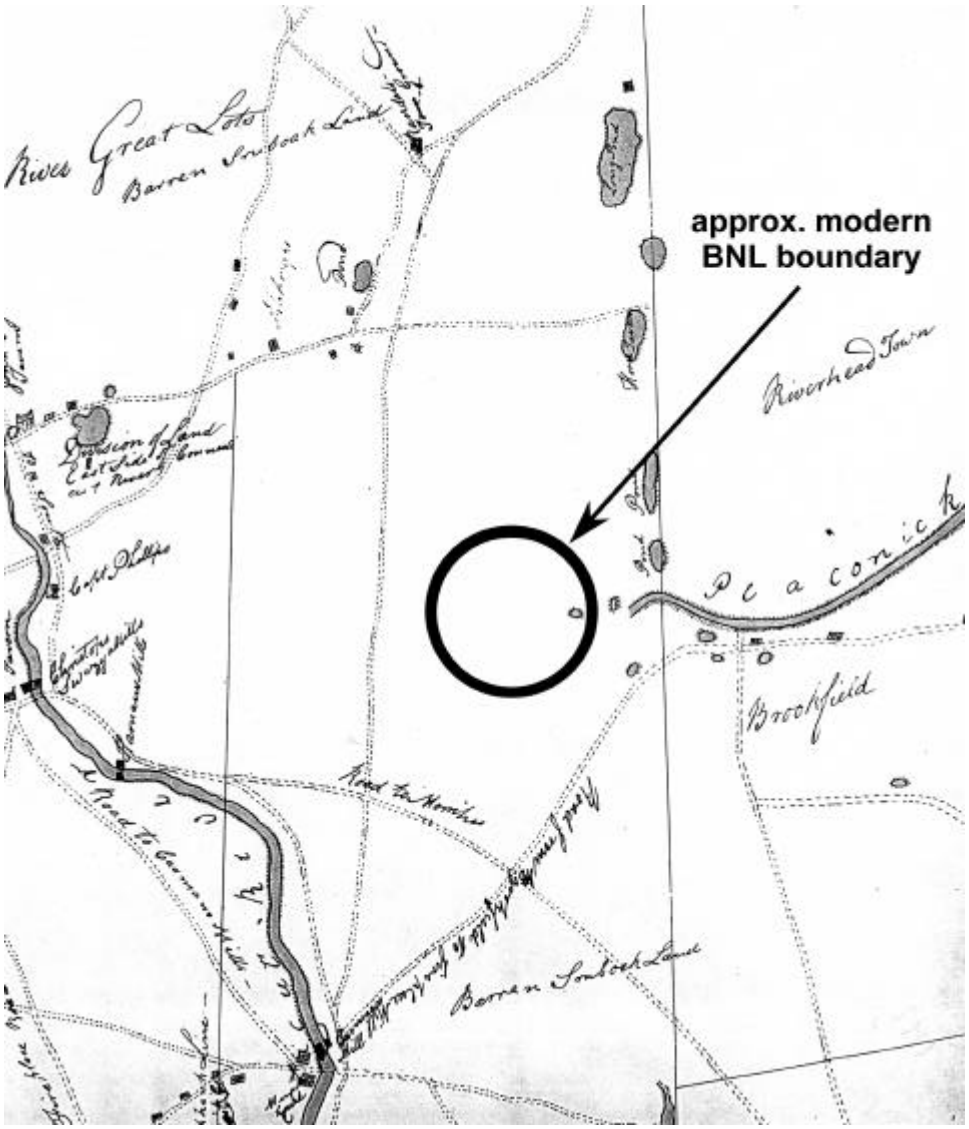

Figure 3. 1797 Hulse *Survey of the Town of Brookhaven*. The BNL property is shown as undeveloped land west of the headwaters of the "Peaconick River."

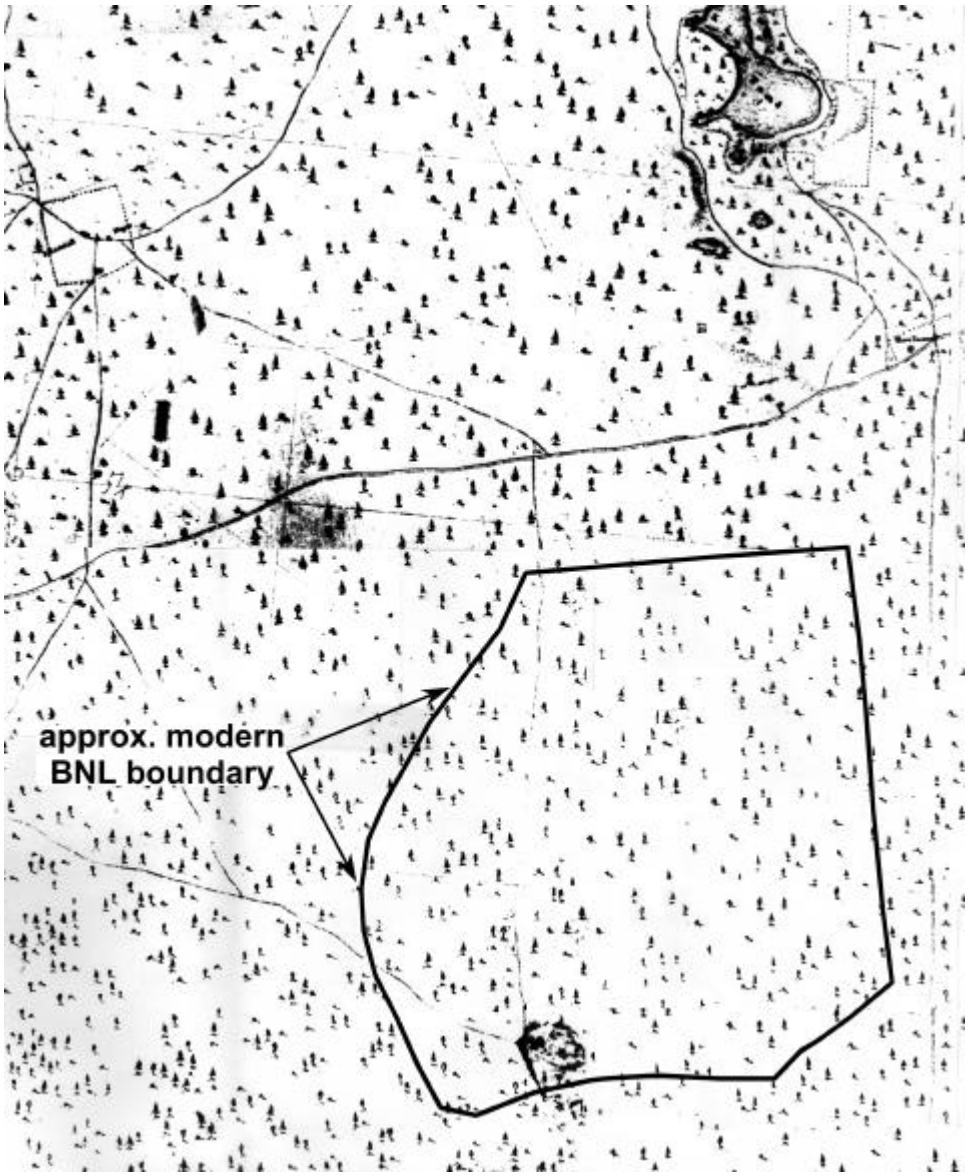

Figure 4. 1838 United States Coastal Survey showing the BNL parcel as undeveloped woods.

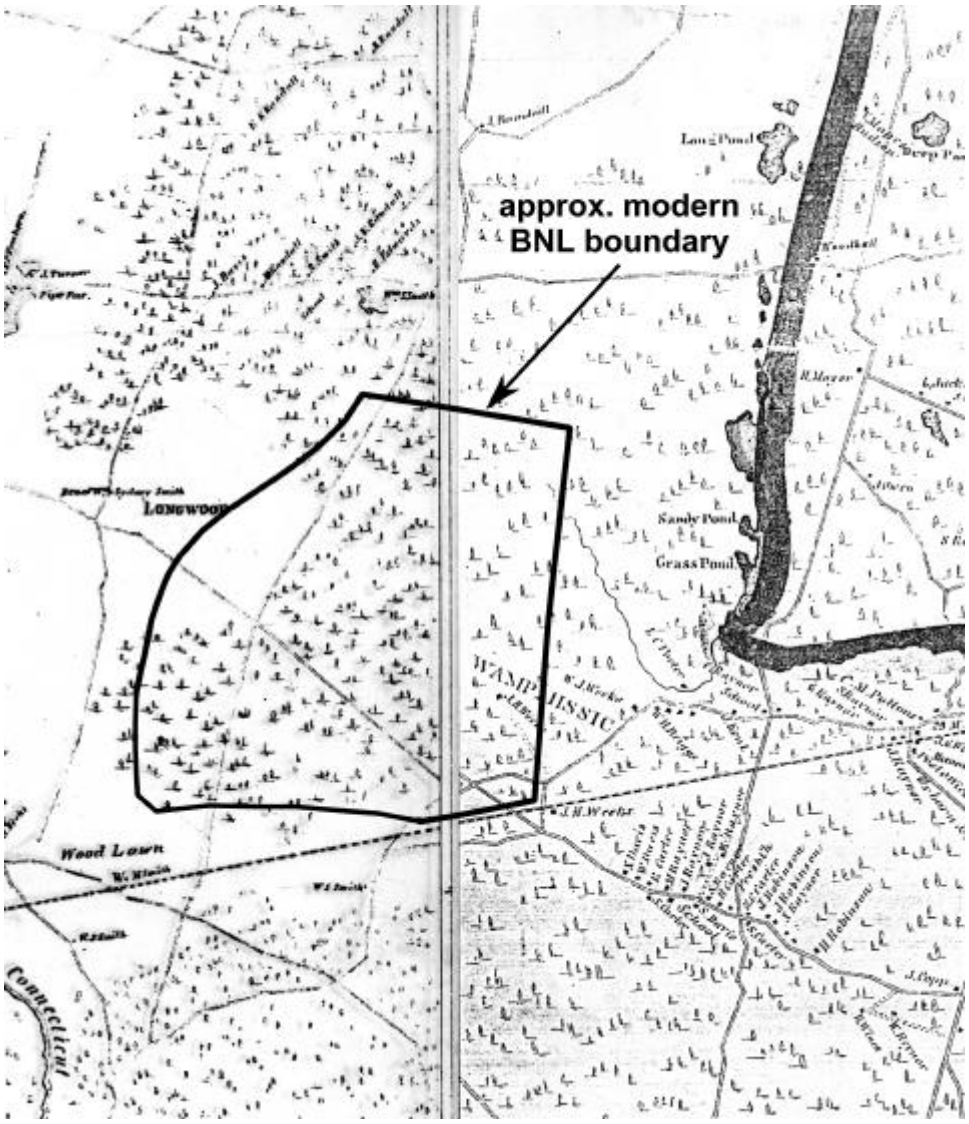

Figure 5. 1858 Chace *Map of Suffolk County*. The BNL property is depicted as undeveloped woods. The northwest-southeast road between the Longwood Estate and "Wampmissic" is on or near the modern course of Princeton Avenue within the project area.

The 1838 United States Coastal Survey (Figure 4) is among the earliest maps showing detailed topographic and man-made features on the landscape of Long Island. Here, a small settlement at Wading River and another community on Carmans River in Yaphank are depicted, but nearly all of the land in between is illustrated as undeveloped woods crossed by a few dirt trails. A similar land use pattern is shown on the 1843 Mather and Smith Geological Map of Long and Staten Islands.

The 1858 Chace *Map of Suffolk County* (Figure 5) and 1873 Beers *Atlas of Long Island* (Figure 6) illustrate similar settlement patterns to earlier maps, although by this time the railroad had reached Brookhaven, and the extent of woodlands in central Brookhaven was greatly reduced. Settlement of interior regions of Suffolk County was facilitated by the railroad, as reflected by the growth of communities like "Wampmissic" and Manorville south and east of BNL. The location of the Weeks house shown in the extreme southeast corner of the project area on Figure 6 may have stood within or adjacent to the modern boundaries of BNL, but this structure does not appear on any twentieth century maps. Despite increasing population throughout the interior reaches of Brookhaven township, nearly all of the BNL property is depicted as undeveloped woods on the 1858 map, and as vacant land on the 1873 map. Similarly, the project area is shown as open space on the 1896 Hyde *Atlas of Long Island* (Figure 7).

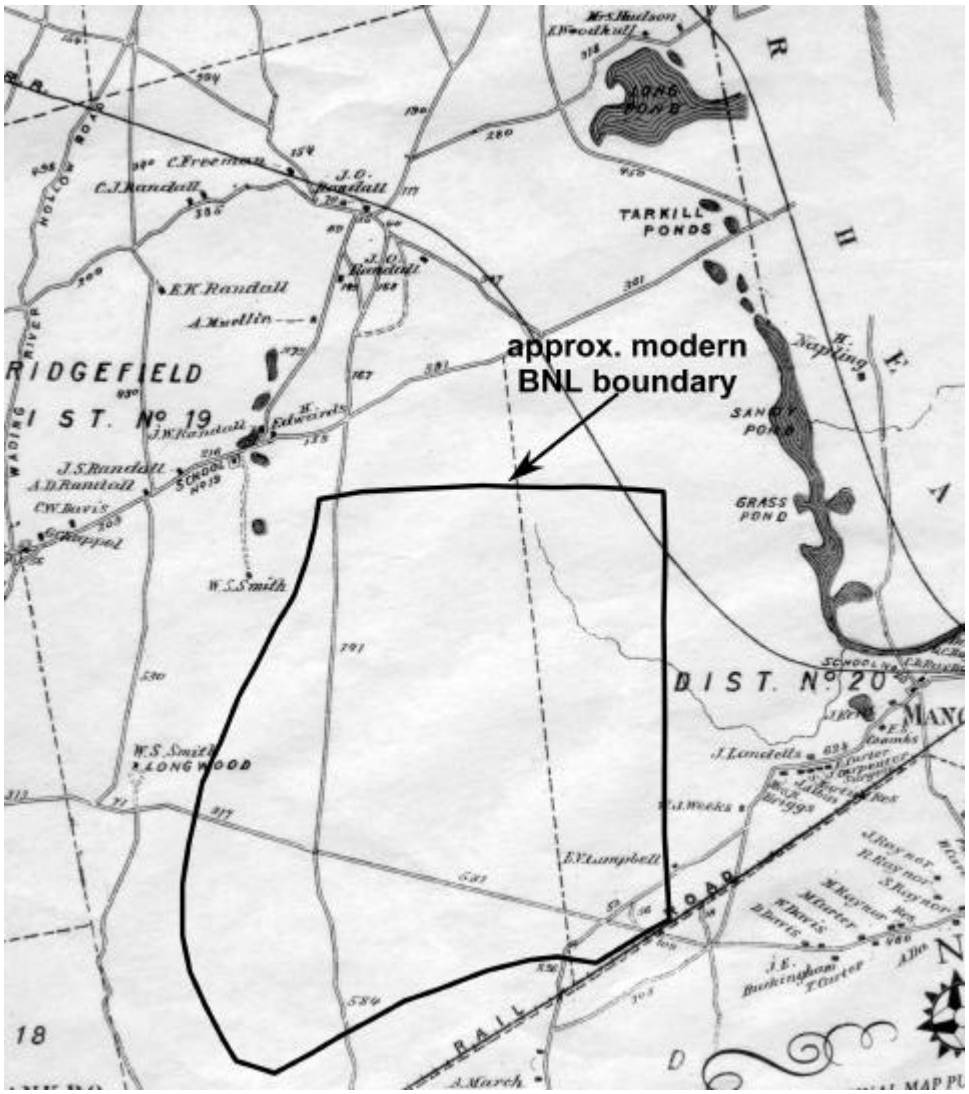

Figure 6. 1873 Beers *Atlas of Long Island* showing the location of the project area. The two roads illustrated within the BNL property are on or very near the modern courses of Upton Road (north-south) and Princeton Avenue (northwest-southeast). Despite increasing population in central Brookhaven township, the project area remained open, undeveloped land.

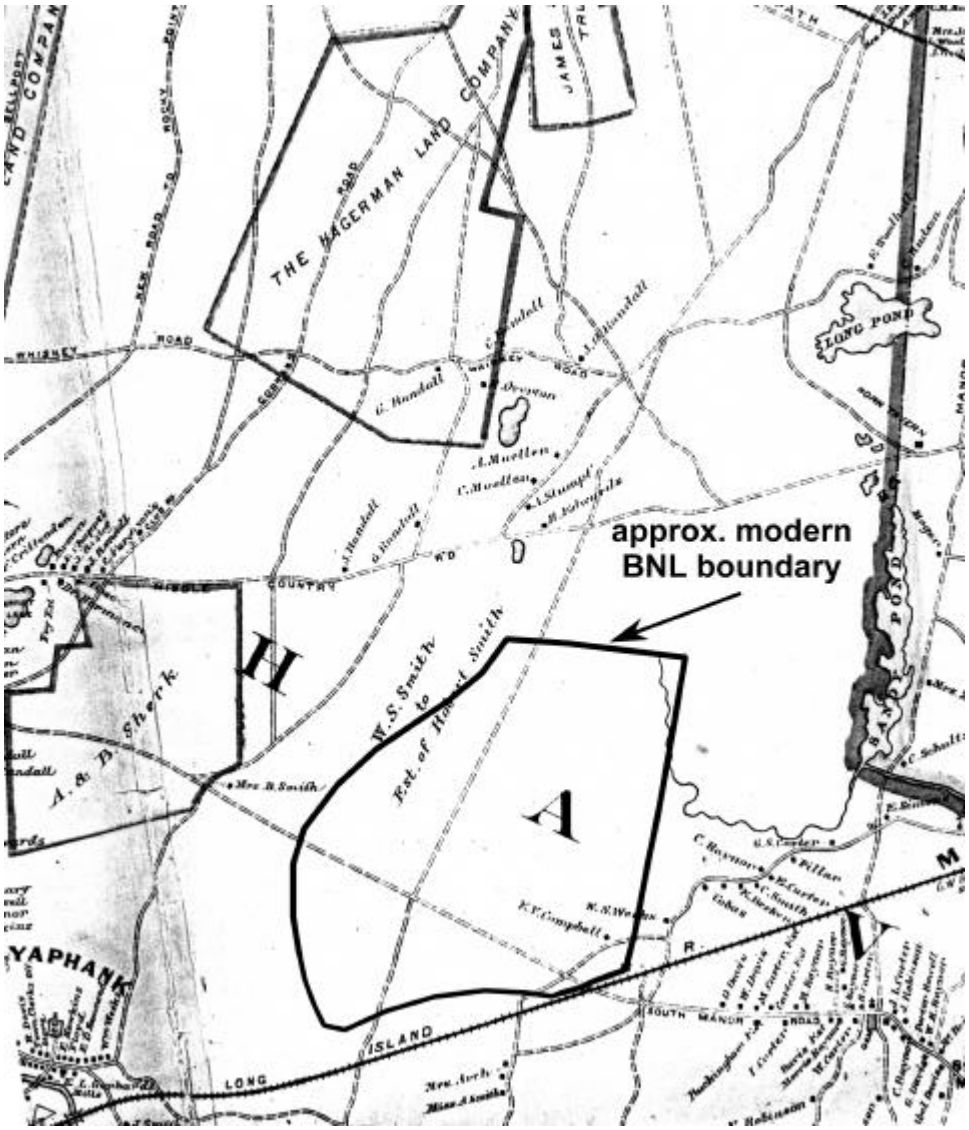

Figure 7. 1896 Hyde *Atlas of Long Island* showing the BNL property as open space.

World War I Camp Upton

Shortly after the United States declared war against Germany in April 1917, mobilization for the war effort commenced and several training cantonments were built throughout the country. The site of Camp Upton was selected for one of these cantonments because of its proximity to New York City (the source of thousands of recruits), and access to water and electricity.

The Federal government acquired approximately 40 square kilometers (15 square miles) of central Long Island woodland in June 1917 (Figures 8 through 10), and construction of Camp Upton was contracted to the Thompson-Starrett Company of New York. Construction of the facility required the clearing of over 560 hectares (1400 acres) of pine barren forest. The main area of the camp was located near the center of the property (Figure 10), with drill grounds provided on all sides, taking care that the prevailing winds would not blow over the stables before reaching the barracks (Coyne 1919; Meyers 1918).

Camp Upton received its first draftees on September 10, 1917 (Figure 11), although the official completion of the facility was not until December of that year (Dwyer 1970a). A total of 1719 buildings was constructed, many of which were built assembly-line style (Figure 12), so that once the technique had been perfected, a 30 by 60 foot (9 by 18 meters) building could be raised in about five minutes (Donahue 1918). Barracks, stables, and warehouses were wood framed buildings set on wooden post foundations. Most of the lumber used was a low grade of unseasoned southern yellow pine (Meyers 1918).

Camp Upton (named after Civil War Major General Emery Upton) was active between September 1917 and October 1918, and served as the training camp of the Army 77th Division under the leadership of Major General J. Franklin Bell (Figure 13). Most of the recruits were from the New York Metropolitan area, and were ethnically and racially diverse. African-American men were segregated in separate barracks. By October 1917, 30,000 soldiers were being trained at Camp Upton (Dwyer 1962)(Figure 14). The 77th Division was recognized for valor and skill during a major campaign in the Argonne Forest, France, in August of 1918.

A major component of training was instruction in trench warfare, a military technique which reached its peak during World War I. European officers instructed the Camp Upton

recruits in the methods of trench construction, as well as "the technique of going over the top, throwing hand grenades, protecting themselves from... machine gun fire, and crawling through barbed wire entanglements" (Dwyer 1970b:55). An extensive network of training trenches was excavated throughout Camp Upton, sections of which are extant on the Brookhaven National Laboratory property. Sections of the remnant trenches previously have been determined to be eligible for the National Register of Historic Places (Tim Green, personal communication, 2000). Among the types of trenches identified during a mid-1970s cultural resource investigation of a portion of BNL (Johannemann and Schroeder 1977, 1978) are approach trenches, communication trenches, firing trenches, and local trenches. Each of these trench types served a particular function on the battlefield, as reflected by their design (U.S. Army Corps of Engineers 1917).

After Armistice Day in November 1918, Camp Upton became the demobilization center where the 77th Division was discharged. This operation was completed in May 1919, and a government order closed Camp Upton the following year. Approximately 1,660 structures, utilities, and even livestock were sold at public auction in August 1921, and the entire camp was dismantled and cleared in three days (Bayles 1977). Only two structures remain in their original location from World War I era Camp Upton, Buildings 455 and 482. Both are probably extant because they are masonry structures, which would have been difficult to remove from the site (Bernstein et al. 2001).

The 1904/1920 United States Geological Survey topographic map of *Moriches, New York* (15 minute series; Figure 8) outlines the extent of lands acquired by the Federal government for World War I Camp Upton. The parcel north of Middle Country Road (New York State Route 25), now Brookhaven State Park, is not included within the boundaries of Camp Upton as shown on the 1904/1920 map. Land north of Middle Country Road is identified as belonging to the North Shore Development company on the 1917 Hyde *Atlas of a Part of Suffolk County*. The 1917 Hyde Atlas (Figure 9) does not show the location of individual buildings or other man-made landscape features, but indicates that at the time the map was drawn "extensive improvements and buildings [were] now under construction." These improvements and the general layout of the cantonment are depicted on a U.S. Army Quartermaster Corps map of Camp Upton (Figure 10) dated October 1917. By the time of the 1930 Dolph and Stewart *Atlas of*

Suffolk County (Figure 15), nearly all of the World War I era buildings had been removed from the site, and the Federal government landholdings (identified as the Upton National Forest) extended north of Middle Country Road, including what is now Brookhaven State Park.

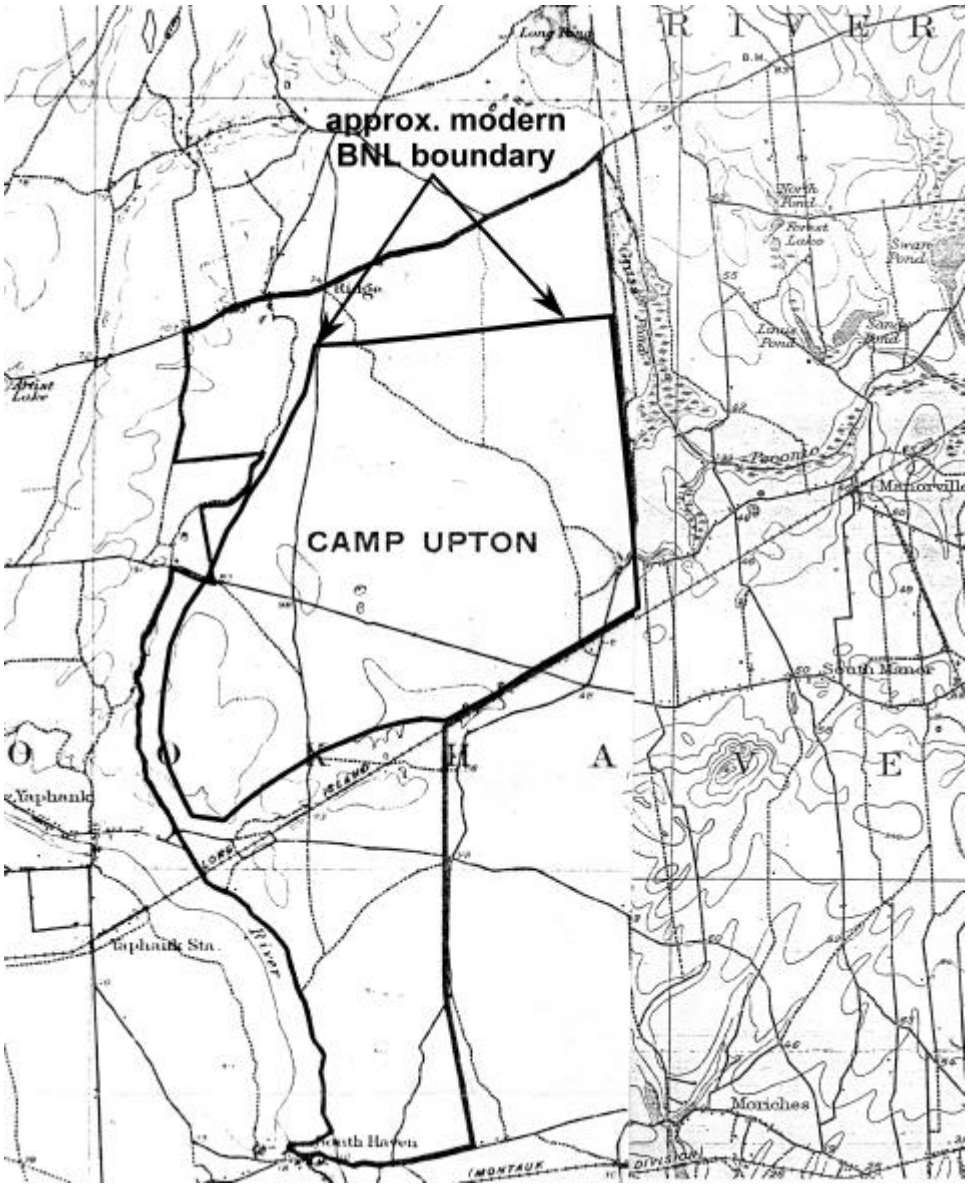

Figure 8. 1904/1920 USGS topographic map of *Moriches, New York* (15 minute series) showing the extent of World War I Camp Upton.

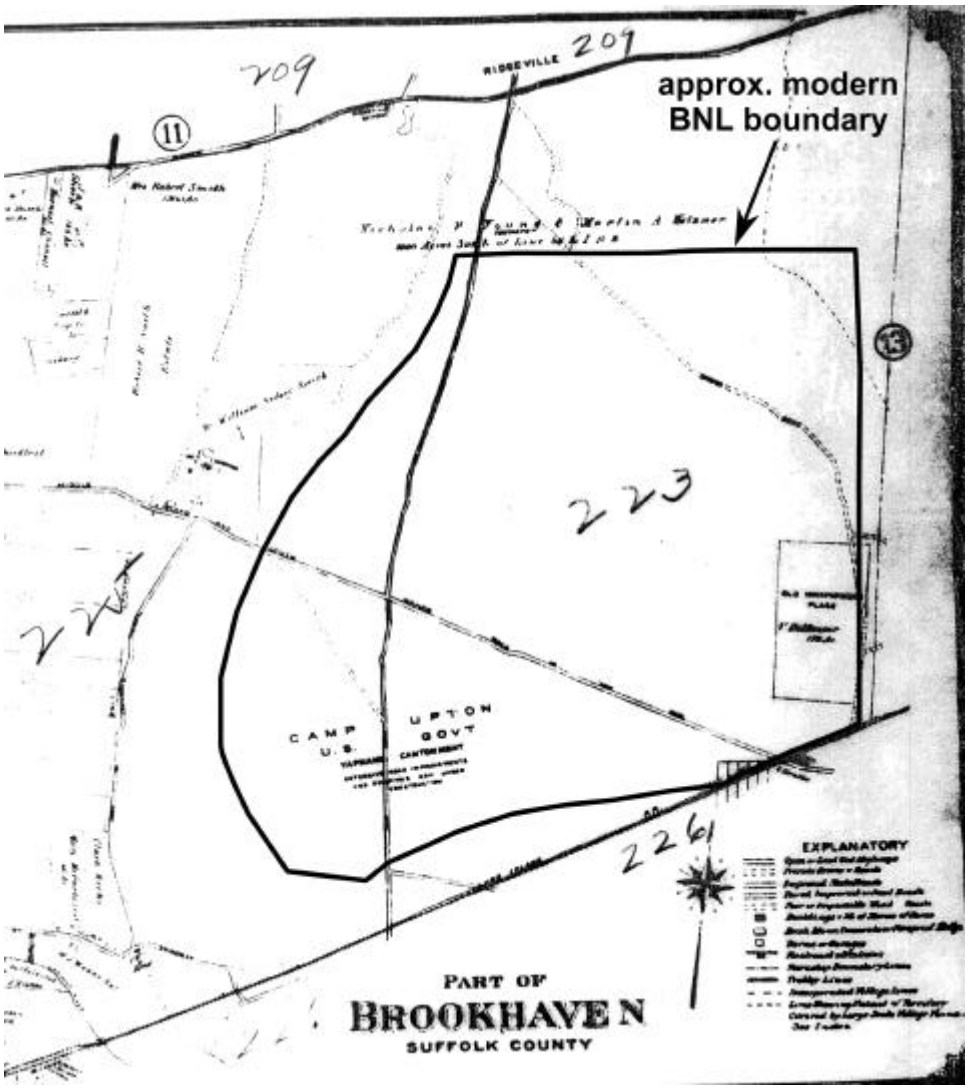

Figure 9. 1917 Hyde *Atlas of a Part of Suffolk County* illustrating the general location of the Army cantonment at Camp Upton. Land north of what is now BNL property is identified as belonging to Young and Metzner, while land on the north side of Middle Country Road in "Ridgeville" was identified as the holdings of the North Shore Development company.

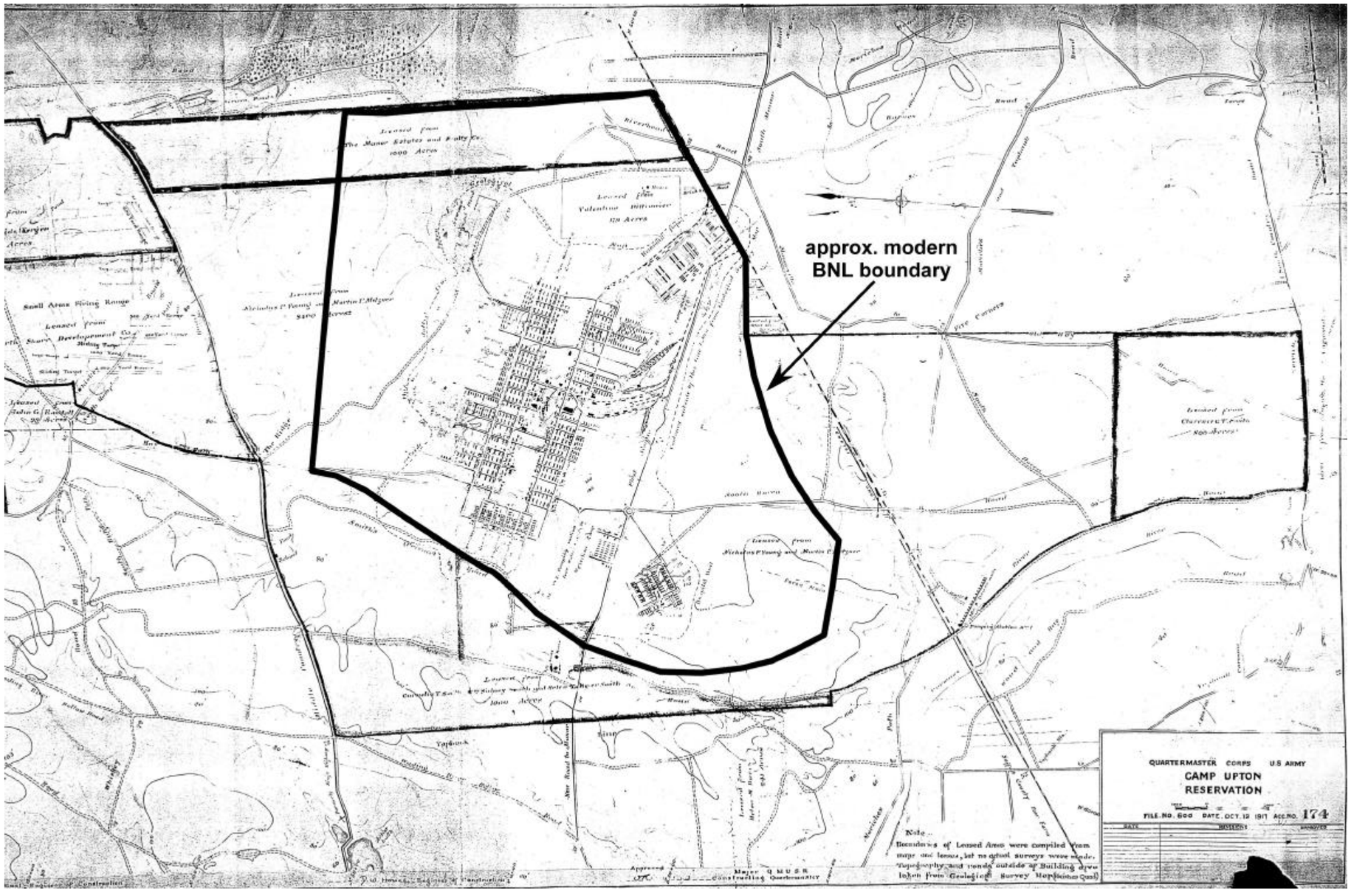

Figure 10. 1917 U.S. Army Quartermaster Corps map of Camp Upton and properties.

Figure 11. Circa 1917 postcard showing draftees arriving at the Camp Upton rail station.

Figure 12. Postcard showing a typical view of barracks at Camp Upton during World War I.

Figure 13. World War I Camp Upton command headquarters. Note sparse vegetation on the outwash plain in the background.

Figure 14. Postcard showing soldier training at circa 1917 Camp Upton.

Civilian Conservation Corps

In 1933, President Franklin Roosevelt established a program known as the Emergency Conservation Work, later called the Civilian Conservation Corps (CCC), in an effort to provide income to otherwise unemployed men during the Great Depression. Laborers lived in group camps, and were active in soil conservation, disaster relief, and parks improvement throughout the country. By the time the program was terminated in 1942, the CCC had employed more than two million men at over 2,500 camps, making the CCC one of the most extensive and successful of the Depression era social programs (Salmond 1967).

During the mid-1930s, the CCC developed an 8,000 acre tract, including Camp Upton, as a state demonstration forest and game preserve. More than 800 CCC workers cleared fire lanes, planted grains to attract wildlife, and reforested much of the cleared camp with approximately two million pine and locust saplings. In addition, because nearly all structures had been removed from the site of Camp Upton by 1921, CCC workers built their own barracks and other support structures.

There were four CCC work camps stationed at Camp Upton, or Upton National Forest as it was called in the 1930s (Figure 15). Each of the camps consisted of approximately two hundred men, and work began in 1934. Three of the companies were involved with constructing fire breaks and trails, digging water holes to aid in forest fire fighting, and with reforestation. The fourth company established a public shooting game preserve (now Brookhaven State Park)(*Middle Island Mail* 1935). By late 1935, two of the work camps were dismissed, followed shortly by the removal of a third camp in January 1936 (*Middle Island Mail* 1936).

The CCC occupied the BNL landscape for a relatively short period, resulting in few traces other than acres of propagated pine trees and the two extant buildings (Buildings 30 and 51)(Bernstein et al. 2001). However, between 1934 and 1936, more than 1,000 acres were planted with sapling trees, more than 700 acres were planted with grain, more than fifty miles of fire breaks and 26 miles of truck trails were constructed, nearly three miles of telephone line were laid, and several water holes were dug (*Middle Island Mail* 1936).

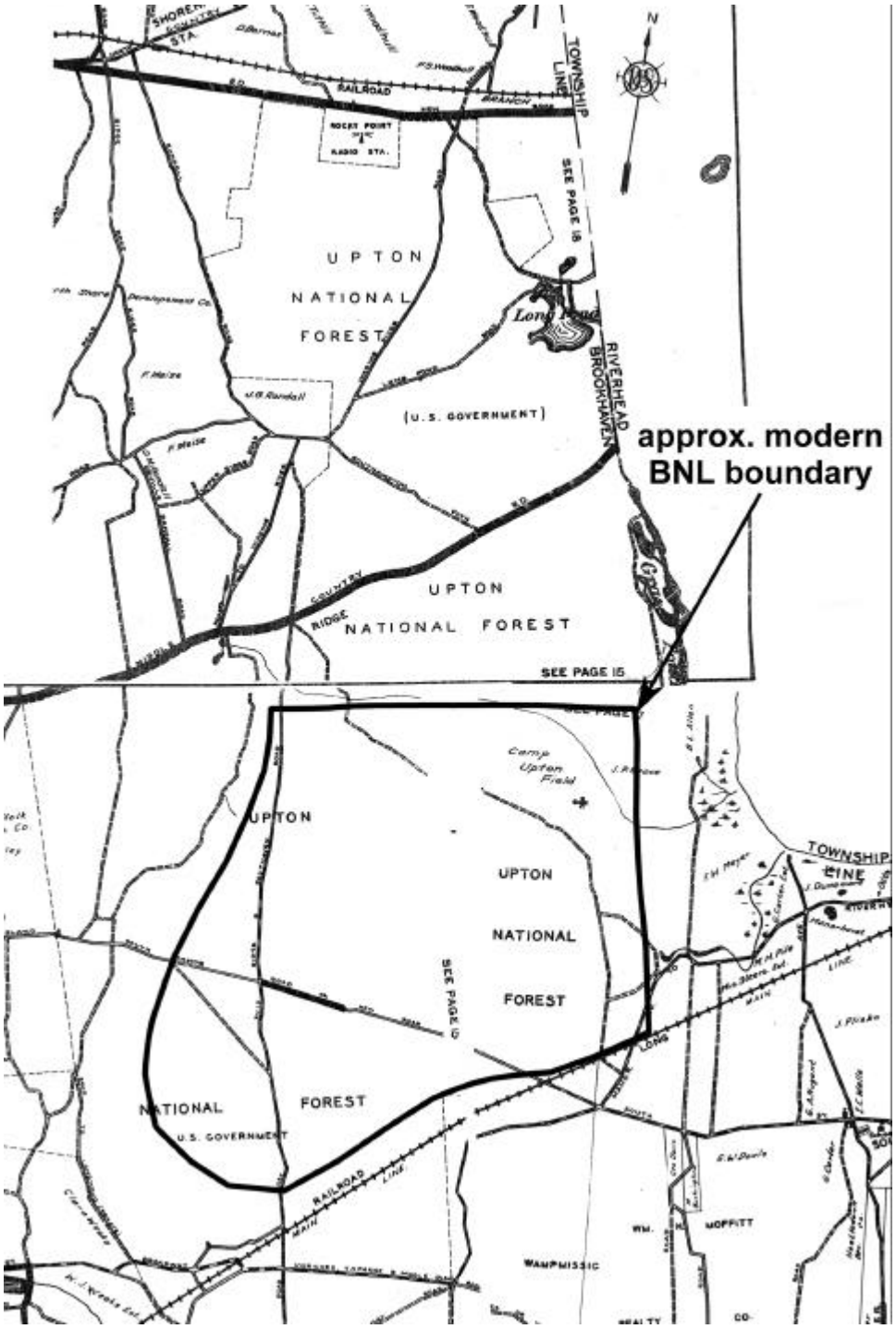

Figure 15. 1930 Dolph and Stewart *Atlas of Suffolk County* showing the extent of "Upton National Forest" beyond the modern boundaries of BNL.

World War II Camp Upton

Much of the CCC reforestation efforts were wasted when Camp Upton was rebuilt and re-opened in 1940, as underbrush and saplings were cleared and roads and sewers improved. Camp Upton served primarily as an induction center for thousands of World War II Army draftees until the induction center was moved to Fort Dix, New Jersey in 1944. Camp Upton was then converted into a rehabilitation hospital for wounded soldiers. Recreational therapy for the returning convalescents required the construction of facilities such as a bowling alley, swimming pools, and tennis courts. In addition to providing services to returning American soldiers, Camp Upton briefly served as a prisoner-of-war camp for approximately 840 German men in 1945-1946 (Johannemann and Schroeder 1978:6-7). The general land area used during the World War II period at Camp Upton is shown in Figure 16.

After World War II, Camp Upton was transformed into the site of a new government laboratory. In July 1946, the property was transferred from the Army to the Associated Universities Incorporated in conjunction with the Atomic Energy Commission to form a peacetime (non-weapons) atomic research facility. The former Camp Upton site was selected as a compromise, as it was accessible to research institutions throughout the Northeast, several miles from heavily populated areas, and a large government parcel allowing for future growth. In addition, approximately 300 structures built for the World War II operation of Camp Upton were vacant and available for conversion into research laboratories and offices (Dwyer 1966:8). An active demolition and new construction program reduced the number of World War II era buildings (wood frame barracks and cement block structures) to about 140 by the mid-1960s.

Historic Period Summary

In summary, there is one documented historic period archaeological site within the BNL property, the World War I era trenches (two locations inventoried by SHPO as A10302.000474 [Appendix]). Other than the Weeks house (shown on the 1858 map, which may have stood within or adjacent to the southeast corner of the project area), there are no map documented structures within the project area prior to the twentieth century, and it is likely that the project area witnessed little use other than sporadic hunting and cordwood cutting before the parcel was

acquired by the Federal government for Camp Upton. Twentieth century occupation of Camp Upton, especially during the World War I (1917-1921), CCC (1934-1936), and World War II (1940-1946) eras, has resulted in significant changes to the landscape, with activities ranging from clearing (along with removal of tree stumps by dynamite), cutting, filling, grading, excavation of World War I training trenches and CCC water holes, to road and building construction.

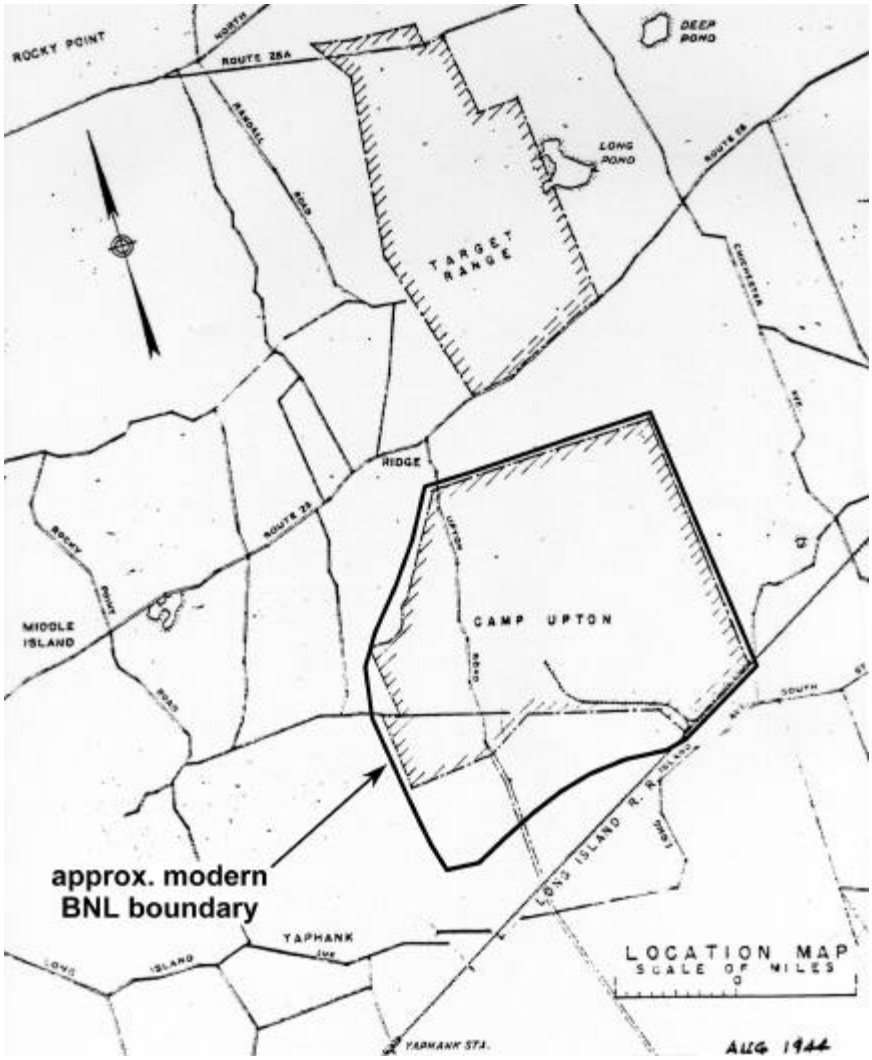

Figure 16. 1944 U.S. Army Corps of Engineers Map showing the extent of World War II Camp Upton.

ARCHAEOLOGICAL SENSITIVITY

Prehistoric Cultural Resources

Based on the location of known prehistoric archaeological sites, as well as a consideration of environmental features, portions of the Brookhaven National Laboratory property have a high sensitivity for the presence of prehistoric deposits. These include areas of the property within or adjacent to wetlands and other fresh water sources, especially the Peconic River. These wetlands would have provided abundant natural resources attractive to Native American peoples, including waterfowl, small mammals, and a variety of edible and medicinal plants. The local paucity of suitable lithic raw material necessary for the manufacture of stone tools probably resulted in only seasonal or itinerant utilization of the region, with more permanent settlements located on the North Shore of Long Island (where both lithic and wetlands resources were available). If present, expected site types might include small manifestations of prehistoric activity (with a relatively low density and/or diversity of artifacts) that may represent specialized foraging activities or tool repair incidents which occurred away from the larger camps (Bernstein et al. 1996).

If prehistoric archaeological sites exist on the grounds of BNL, they could have significant research potential for understanding settlement and subsistence patterns for the interior regions of eastern Long Island.

Sections of the BNL property which are not adjacent to fresh water resources have a low to moderate potential for prehistoric archaeological sites. In addition, many portions of the BNL property have been thoroughly disturbed by twentieth century land use activities (e.g., road and building construction). Disturbed areas have a very low sensitivity for the presence of intact archaeological deposits.

Historic Cultural Resources

Based on the results of the site file search, survey of historic maps, and a consideration of local history and land use, the BNL property has an overall low sensitivity for the presence of

historic period archaeological resources dating prior to the early twentieth century, but a moderate to high sensitivity for the presence of cultural material associated with Camp Upton. The potential for pre-World War I resources is the lowest, as the project area witnessed little discernable land use (possibly hunting, cord wood cutting, and other sporadic activities) prior to the early twentieth century when it was acquired by the Federal government for a military cantonment.

In terms of World War I era resources, there are probably unmapped remains of trenches, foundations, and other features associated with Camp Upton throughout the grounds of BNL, and nearby along William Floyd Parkway and New York State Route 25. Most of the moveable objects (including buildings and furnishings) on the site of World War I Camp Upton were sold at auction in 1921, so remaining archaeological deposits most likely would include trash middens created during the period of occupation and abandonment, as well as stray finds of ordnance around firing ranges and lost personal items around former barracks and drill grounds. Two sections of training trenches on the grounds of BNL have been previously identified as potentially eligible for inclusion on the National Register of Historic Places, and it is possible that additional archaeological resources from this period would have local, State, and National significance. In particular, trench warfare reached its peak of use worldwide during World War I, and the presence of preserved trenches and associated features on the grounds of BNL documenting their construction techniques and training methods is very significant for both American and international military history.

It is likely that CCC era archaeological resources exist on the BNL property, created both during the occupation by four work camps in 1934 and 1935, and during the relatively rapid abandonment of the camps in 1935 and 1936. Changes to the landscape made by CCC work crews, including trails, water holes, and planted forests, are present within and adjacent to the modern boundaries of BNL. Subsurface archaeological deposits associated with the CCC occupation could include refuse middens in the vicinity of the former location of barracks and the recreation building/mess hall (Building 30). More than 2,500 CCC camps were established throughout the United States by 1935, but few have been investigated for potential archaeological data (Smith 2001). If present, archaeological deposits associated with CCC activities within the

project area could provide potentially significant information on temporary laborers' camp activity and behavior for this period in American history.

Many of the buildings from World War II Camp Upton are still standing, and retain historic integrity through original location and setting, some construction and design elements, and overall feeling and association. The above-ground World War II Camp Upton resources are significant for the study of military history and military architecture and planning (Bernstein et al. 2001). Any archaeological deposits from the World War II era on the BNL property are probably not significant individually, but could be considered contributing components to a potentially State and National Register eligible historic district.

CONCLUSIONS

In summary, the Brookhaven National Laboratory property in Upton, Town of Brookhaven, Suffolk County, New York may contain significant archaeological resources. Based on the results of the archaeological site file searches and a consideration of environmental features, portions of the BNL property have a high sensitivity for the presence of archaeological remains. For prehistoric resources, these include areas of the property within or adjacent to wetlands and other fresh water sources. If prehistoric materials are present, they are most likely small manifestations that may represent hunting or specialized collecting which occurred away from larger interior camps. Sections of the BNL property which are not adjacent to fresh water resources have a low to moderate potential for prehistoric archaeological sites. In addition, many portions of the BNL property have been thoroughly disturbed by twentieth century land use activities (e.g., road and building construction). Disturbed areas have a very low sensitivity for the presence of intact archaeological deposits.

The BNL property has an overall low sensitivity for the presence of historic period archaeological resources dating prior to the early twentieth century, but a moderate to high sensitivity for the presence of cultural material associated with Camp Upton. Expected historic period archaeological remains include early to mid-twentieth century deposits from World War I era Camp Upton (1917-1921, including training trenches and other earthworks potentially located throughout the entire BNL parcel), the Civilian Conservation Corps period (1934-1936), and World War II Camp Upton (1940-1946). Such early to mid-twentieth century archaeological resources would be potentially significant at local, State, and National levels.

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APPENDIX: SITE FILE SEARCH RESULTS

Appendix B

Significance Category Table

Appendix B

Cultural Significance Categories Table

Grid #	Bldg #	Building/Site Name	Date	NRHP Eligible	Category
Multi	N/A	World War I Training Trenches and foundations	1917	Yes	I
70/80	N/A	1800's Home Sites	1850's	Yes	I
109	364	1960s Efficiency Apt.	1962	Yes	I
101	365	1960s Efficiency Apt.	1962	Yes	I
65	701	Brookhaven Graphite Research Reactor (BGRR)	1949	Yes	I
65	703	BGRR Office & Laboratories	1949	Yes	I
64	902	Cosmotron	1949	Yes	I
64	913	Alternating Gradient Synchrotron	1957	Yes	I
64	913A-E	AGS Fan Houses	1957	Yes	II
84	490	Medical Research Center/Program	1958	Yes	I
84	491	Medical Research Reactor	1958	Yes	I
75	750	High Flux Beam Reactor	1964	Yes	I
75	510	Physics	1962	Yes	I
75	515	Computational Sciences	1966	Yes	I
75	535	Instrumentation	1964	Yes	I
74	555	Chemistry	1966	Yes	I
74	488	Berkner Hall	1968	Yes	I
75	751	Cold Neutron Facility	1970	Yes	II
65	801	Isotope Research and Processing	1950	Yes	II
66	820	Accelerator Test Facility	1957	Yes	II
66	820B	ATF Storage	1957	Yes	II
66	830	EBNN Research Operations	1962	Yes	II
54	930	LINAC	1969	Yes	II
64	911	Collider Accelerator Building	1956	Yes	II
55	912	AGS Experimental Hall	1958	Yes	II
21/29	N/A	Gamma Forest Site	1961	Yes	II
75	901	Isochronous Cyclotrons	1949	Yes	II
75	901A	Tandem Van de Graaff Accelerator	1968	Yes	II

Representative Period Buildings

93	**30**	**Brookhaven Center**	**1934**	**No**	**II**
75	**120**	**Building 120 (barracks)**	**1942**	**Yes**	**I**
94	**STO-049**	**1940s Water Tower**	**1941**	**Yes**	**I**

(Descriptions of each category are presented on the following page)

Category I: A building, site or program determined to be historically significant due to: historic context; architecture; engineering & design; direct association with important personages; or scientific achievement. The resource(s) may be individually eligible for listing on the National Register, however, eligibility is not a requirement.

Treatment and/or mitigation: Some degree of treatment and/or mitigation is necessary to ensure cultural significance is retained and available for interpretation. Examples include, but are not limited to:

- Specific treatment or architectural management plan, if architecturally significant;
- Documentation of engineering & design, and scientific achievements (photos, scale- models, document archives, etc.)
- Preservation/display of associated equipment

Category II: A building, facility or site that directly supported a significant BNL program, or uniquely represents a specific period in the evolution of BNL's site history and has had little alteration.

Treatment and/or mitigation:

For support buildings: As-built drawings and photos; documented description of structure's role (may be included in existing facility description documents).

For period structures: Treatment plans to minimize further alteration of specifically identified aspects (implementation is funding dependent). Mitigation would entail documentation of as-built drawings and photos.

Category III: Buildings or structures that supported lab-wide programs and may be representative of the evolution of government use of the site.

Buildings in this category include the World War II era buildings. During a site visit (January 3, 2003), SHPO agreed that these structures would not be considered eligible for the National Register. However, since these types of structures do represent a distinct period in the site and BNL history, the following means may be used to document the association.

Mitigation: Document the development and evolution of the site by archiving engineering and plan drawings of site layout, building plans and photos for select structures, and aerial photos.

APPENDIX C

Cultural Resource Management Strategy Forms

This appendix to the Cultural Resource Management Plan contains the management strategy forms associated with each specific resource. Refer to Section 4.4.1 of this plan for additional details. These forms may be revised as necessary but must have BNL management and DOE/BHSO concurrence and be submitted by DOE-BHSO to the New York State Historic Preservation Officer for a 30-day review and comment period. Each form contains a revision number and date.

The following Cultural Resource Management Strategy Forms (listed alphabetically) have been developed to date:

Alternating Gradient Synchrotron (AGS)
Brookhaven Graphite Research Reactor Complex
Brookhaven Medical Research Reactor
Building 30, Brookhaven Center
Building 120, Former Barracks Building
Cosmotron
Gamma Forest
High Flux Beam Reactor Complex
Hot Laboratory
Medical Research Center (Program)
Weeks Campbell Site
W.J. Weeks House Site
World War I Foundation Features
World War I Training Trenches

Strategy Forms needing to be developed or updated:

Buildings 364 and 365 – 1960s era Apartments
Berkner Hall
Physics and Computational Sciences
Instrumentation
Chemistry
Accelerator Test Facility
Environmental Sciences (HRTL)
Tandem Van DeGraff
Cyclotron/ITD Help Center
Collider Accelerator Offices
AGS Experimental Hall
LINAC

Cultural Resource Management Strategy Form

Building/Site Name: Alternating Gradient Synchrotron (AGS) Complex

BNL Bldg. #: 911, 912, 913 & support buildings **Grid #:** 55 & 64 **Site #:** 10302.002559

Date of construction or period of use: Construction: 1956-58 (Operating history: 1960 - present)

Historic Significance Category: ☒ **I or** ☐ **II or** ☐ **N/A**

Historic Role(s): Engineering & Design; BNL's development history; scientific achievements

- Engineering & design -- The world's highest energy accelerator from 1960-1968
- Facility housed sites of research leading to three Nobel prizes (1976, 1980, 1988)

Current Significant Feature(s): (Examples: exterior architecture; extant location; associated w/important personage; scientific achievement [e.g.; Nobel Prize]; unique facility; etc.)

-- Association with Nobel Prize experiments.

-- Extant structure & site consist of the tunnel (Bldg 913) housing the ring magnets and associated equipment, steel framed sheet metal sided & roofed Experimental Hall (Bldg. 912), the administrative support building (Bldg. 911), and miscellaneous support buildings. Note: AGS buildings are not the significant feature of this resource.

Plans for Bldg or Site:

- The buildings and machine continue to function in the original design as a particle accelerator for physics experiments. Upgrades to the machine are planned in order to increase its intensity.
- The buildings/structures should not be the focus of this cultural resource.

Treatment and/or Mitigation Plans:

- Concentrate efforts on preserving information related to the engineering & design of the AGS, and associated scientific achievements. Identify and emphasize items representative of experiments or machine equipment (Ex. Bubble chambers, magnets, etc.)
- Identify significant buildings, systems, and experiments for focus of documentation treatment.

Level A *(achieved, in-progress, or relatively achievable)*

- Emphasize equipment artifacts:
  - Bubble chambers (30-inch & 7-foot) saved – require permanent staging & preservation
  - Bubble chamber windows – requires permanent mounting
- Identify & evaluate other equipment artifacts
- Scale model of magnet line
- Identify and retain historic photos
- Display information on Nobel Prizes

Level B *(resource permitting)*

- Conduct 'Living History' interviews
- Records search & archive
- Develop Researcher's Guide to AGS Complex Facilities & Scientific Research

Cultural Resource Management Strategy Form

Building/Site Name: Brookhaven Graphite Research Reactor (BGRR) Complex

BNL Bldg. #: 701, 702, 703, 704, 705, 708, 709, 709A, 801 **Grid #:** 65 **Site #:** 10302.001608

Date of construction or period of use: Construction: 1949 (Operating history: 1949 – 1969)

Historic Significance Category: ☒ **I or** ☐ **II or** ☐ **N/A**

Historic Role(s): *Scientific achievement, Engineering/design*

- Laboratory's first big machine and the first U.S. peace-time reactor
- Development of radioisotope technetium-99m, radiography of archeological artifacts; materials studies; etc.
- Determined eligible for listing on the National Register of Historic Places in 1999

Current Significant Feature(s): (Examples: exterior architecture; extant location; associated w/important personage; scientific achievement [e.g.; Nobel Prize]; unique facility; etc.)

-- Scientific achievements: Development of radiotracer Tc-99m, other studies.
-- Extant building(s) remains in place – pending finalization and implementation of decommissioning plan.
-- The significance of BGRR complex buildings is their association with the BGRR and operations/support functions.

Plans for Bldg or Site:

- A decommissioning plan is being developed for this facility. End state of structure will not be known until D&D plan is finalized & funded – Assume total removal due to radiological contamination issues.

Treatment and/or Mitigation Plans:

- Assuming total D&D, an MOA between SHPO & DOE was signed to address mitigation of D&D and includes development of a History Video, BGRR Researcher's Guide, etc.
- If structures remain after D&D – acknowledge site in CRMP, CR tours, etc.; develop signage, displays, etc.
- Building 701, 703, 801 and other BGRR complex buildings are considered mitigated through the activities identified in the MOA. Future architectural revisions (renovations/additions/removals) would be planned in order to minimize the impact to the visual lines of the buildings and other features directly linked to BGRR. For example:
  - Additions would follow existing architectural lines and similar colors, or be sufficiently distinct in order to differentiate original structure from new.

Level A *(achieved, in-progress, or relatively achievable)*

- Create mitigation package for Stack (Building 705)- refer to HFBR strategy form for details
- BGRR History Video (includes living history interviews) - completed
- Records (including photos & drawings) inventoried by professional archivist – completed
- BGRR Researchers Guide – 70 % complete
- Retain scale model(s) & mock fuel element(s)
- Develop architectural mgmt plan(s) to identify specific features and treatments – assessment completed in 2004
- Website description – completed
- Identify tools & equipment for potential display/preservation – identification completed; storage and documentation to be performed

Level B *(resource permitting)*

- Develop CD ROM version of Researcher's Guide

Cultural Resource Management Strategy Form

Building/Site Name: Brookhaven Medical Research Reactor (BMRR)

BNL Bldg. #: 491 **Grid #:** 84 **Site #:** 10302.002412

Date of construction or period of use: Construction: 1959 (Operating history: 1959 - 2000)

Historic Significance Category: ☒ **I or** ☐ **II or** ☐ **N/A**

Historic Role(s): *Scientific achievement, Engineering/design*

- First reactor in the nation to be constructed specifically for medical research
- Boron neutron capture therapy development

Current Significant Feature(s): (Examples: exterior architecture; extant location; associated w/important personage; scientific achievement [e.g.; Nobel Prize]; unique facility; etc.)

-- Scientific achievements:

-- Extant building & equipment are still in place – pending development and initiation of decommissioning plan.

Plans for Bldg or Site:

- A decommissioning plan is scheduled to be developed for this facility.

Treatment and/or Mitigation Plans:

- End state of structure will not be known until D&D plan is developed & funded – Assume total removal due to radiological contamination issues.
- Focus attention on identifying & preserving information related to engineering/design and scientific achievements of the medical research program - not the building.

Level A *(achieved, in-progress, or relatively achievable)*

- Video building and facility prior to major D&D effort
- Research & compile information regarding significance of medical research
- Retain scale model, photos & drawings
- Website description

Level B *(resource permitting)*

- Conduct 'Living History' interviews
- Records search & archive

Cultural Resource Management Strategy Form

Building/Site Name: Brookhaven Center - Building 30

BNL Bldg. #: 30 **Grid #:** 93 **Site #:** 10302.002295

Date of construction or period of use: Construction: 1934 (1934 – present)

Historic Significance Category: ☐ **I or** ☒ **II or** ☐ **N/A**

Historic Role(s): *Original Civilian Conservation Corp (CCC) Structure*

- Extant CCC building.
- Functioned as an Officer's Club during WWII Camp Upton.

Current Significant Feature(s): (Examples: exterior architecture; extant location; associated w/important personage; scientific achievement [e.g.; Nobel Prize]; unique facility; etc.)

-- Exterior architecture.
-- Extant location.

Plans for Bldg or Site:

- The building is still in use as a club, including ballrooms, with portions also used as support division office space.

Treatment and/or Mitigation Plans:

- Resources permitting, BNL will seek to minimize further alteration to the exterior visual lines or architectural style of the 1930s portions of the building.
- Have architectural evaluation performed - Completed in 2004
  Develop architectural management plan, Examples:
  - Replacement windows would be of similar style, whenever possible.
  - Similar materials would be used in any maintenance or renovation action
- As long as the structure remains in place, it will be acknowledged in the CRMP, CR tours, etc.
- Should the building be scheduled for demolition - a mitigation package would be developed that includes original building plans, photos, etc

Level A *(achieved, in-progress, or relatively achievable)*

- Treatment plan identified above (including architectural mgt. plan).
- Retain early photos & plan drawings.

Level B *(resource permitting)*

- None planned.

Cultural Resource Management Strategy Form

Building/Site Name: Building 120 - Former WWII Barracks Building

BNL Bldg. #: 120 **Grid #:** 75 **Site #:** 10302.002310

Date of construction or period of use: Construction: 1942 (1942 – present)

Historic Significance Category: ☐ **I or** ☒ **II or** ☐ **N/A**

Historic Role(s): *Original World War II Barracks Structure*
The building was originally located in another part of the BNL site, and was relocated in the early BNL years.

Current Significant Feature(s): (Examples: exterior architecture; extant location; associated w/important personage; scientific achievement [e.g.; Nobel Prize]; unique facility; etc.)

-- Exterior architecture. Two Story WW II barracks building with minimal exterior renovations. (e.g., no vinyl siding, double-hung 8/8 windows remain); overhanging roof eaves with wood brackets are examples of architecture once prevalent during Camp Upton and early BNL years.

-- Note: This form only applies to the original two-story portion of Building 120. Newer modular sections were added in the 1980s

Plans for Bldg or Site:

- The building is still in use as office space for support divisions.

Treatment and/or Mitigation Plans:

- Resources permitting, BNL will seek to minimize further alteration to the exterior visual lines or architectural structure of the building. Examples:
  - Replacement windows would be of similar style, whenever possible.
  - Vinyl siding will not be installed.
- As long as the structure remains in place, it will be acknowledged in the CRMP, CR tours, etc.
- Should the building be scheduled for demolition - a mitigation package would be developed that includes original building plans, photos, etc.

Level A *(achieved, in-progress, or relatively achievable)*

- Have architectural evaluation performed to identify significant features & treatments - completed
- Develop architectural management plan
- Retain early photos – completed
- Retain early plan drawings

Level B *(resource permitting)*

- None planned.

Cultural Resource Management Strategy Form

Building/Site Name: Cosmotron

BNL Bldg. #: 902 **Grid #:** 64 **Site #:** 10302.002549

Date of construction or period of use: 1949 (1952-1966)

Historic Significance Category: ☒ **I or** ☐ **II or** ☐ **N/A**

Historic Role(s): Engineering & Design; BNL's development history; scientific achievements

- First accelerator to achieve 1 billion electron volt (BeV or GeV) level & provide external particle beams for experiments
- Led to development of "Strong-Focusing Principle"
- BNL's second major facility – established BNL's leadership in physics community
- 1957 Nobel prize in physics awarded to T.D. Lee and C.N. Yang was associated with Cosmotron experiments

Current Significant Feature(s): (Examples: exterior architecture; extant location; associated w/important personage; scientific achievement [e.g.; Nobel Prize]; unique facility; etc.)

-- Extant structure & site consist of the steel-framed, sheet metal sided & roofed building and attached administrative support offices.

-- The circular outline of the original machine remains visible by a slightly raised ring of concrete in the floor of building 902 where the machine was mounted. (Note: The building and ring area are currently in use for ongoing BNL project activities.)

-- 'C-Magnet' displayed outside building 911

-- Scale models displayed in building 438

Plans for Bldg or Site:

- The area is currently used for assembling and testing superconducting magnets. The building is expected to remain in use as an industrial work area for BNL projects.

Treatment and/or Mitigation Plans:

- Focus attention on preserving information related to the Cosmotron's engineering & design, and associated scientific achievements. Visible ring area and Bldg 902 will be noted in CRMP, but not emphasized as a significant site.

Level A *(achieved, in-progress, or relatively achievable)*

- C-magnet and plaque retained, maintained and displayed
- Scale model(s) and associated material retained, maintained and displayed
- Retain photos & descriptive information files
- Website description

Level B *(resource permitting)*

- Conduct 'Living History' interviews – Initiated in 2003
- Records search & archive

Cultural Resource Management Strategy Form

Building/Site Name: Gamma Forest

BNL Bldg. #: N/A **Grid #:** 21 & 29 **Site #:**

Date of construction or period of use: Construction: 1961 (1961 – 1979)

Historic Significance Category: ☐ **I or** ☒ **II or** ☐ **N/A**

Historic Role(s): *Unique site operated by Biology Dept. from 1961 –1979 to study effects of radiation on plants.*

Current Significant Feature(s): (Examples: exterior architecture; extant location; associated w/important personage; scientific achievement [e.g.; Nobel Prize]; unique facility; etc.)

-- Extant structure & site consist of the steel framed sheet metal operations shed; source storage pit (filled in); source tower (not standing); distance marking stakes.
-- The effects of the radiation on vegetation remain clearly evident through the variation in regrowth patterns

Plans for Bldg or Site:

- The area is currently not in use, and remains in an "abandoned" state since the end of scientific project (1979).

Treatment and/or Mitigation Plans:

- Maintain site in its current state, and make available/accessible for cultural resource tours
- Minor enhancements such as housekeeping, fencing, gravel path, etc. would improve access

Level A *(achieved, in-progress, or relatively achievable)*

- Conduct supervised tours with site current state
- Documentation (research, photos, etc.) search for project information - Create reference file
- Develop interpretive signage for posting at site
- Develop specific management plan defining tasks, responsibilities, etc. for the site
- Develop information for CRM website

Level B *(resource permitting)*

- Improve accessibility (gravel pathway to minimize ticks)

Cultural Resource Management Strategy Form

Building/Site Name: High Flux Beam Reactor (HFBR) Complex

BNL Building #: 704, 705, 707, 707A&B, 715, 750, 751, 753 **Grid #:** 75 **Site #:**

Date of construction or period of use: Construction: 1964 (Operating history: 1965 - 1999)

Historic Significance Category: ☒ **I or** ☐ **II or** ☐ **N/A**

Historic Role(s): *Scientific achievement, Engineering design*

- Unique design resulting in neutron flux peaking outside core for beam line experiments
- Dome structure makes it one of the most recognizable buildings on the BNL site
- Most research reactors built since 1965 incorporate the design innovations, which first appeared in the HFBR
- For over 30 years, the HFBR was one of the premier beam reactors in the world
- Determined eligible for listing on the National Register of Historic Places in 2001

Current Significant Feature(s): (Examples: exterior architecture; extant location; associated w/important personage; scientific achievement [e.g.; Nobel Prize]; unique facility; etc.)

-- Scientific achievements.
-- Extant building & major equipment are still in place – pending development and initiation of decommissioning plan.

Plans for Building or Site:

- A decommissioning plan is being developed for this facility
- End state of structure will not be known until D&D plan is approved & financed – Assume total removal due to radiological contamination & maintenance cost issues.

Treatment and/or Mitigation Plans:

- Focus attention on identifying & preserving information related to engineering design and scientific achievements
- If building remains after D&D – identify significant historic operational features (e.g., Reactor On lights); acknowledge site in CRMP; CR tours, etc.; develop signage & displays

Level A

- Create Mitigation Package specifically for the Stack, to include: Engineering drawings, descriptive information; photos and videos (stack internals, etc.); video stack from various vantage points
- Video buildings and facility prior to major D&D effort
- Retain scale models, mock fuel element, other equipment artifacts and visual items (Curate and make available to interested museums/organizations)
- Identify documents to be made available at BNL Research Library, such as: Plant Description Manual, Final Safety Analysis Report, Operating Procedures Manual, History Researchers Guide, Stack mitigation package
- Retain photos & plan drawings – scan onto digital format
- Develop website
- Research & compile information regarding significance of HFBR research
- Develop History Researcher's Guide

Level B *(resource permitting)*

- Archive records
- Conduct 'Living History' interviews

Cultural Resource Management Strategy Form

Building/Site Name: Hot Laboratory – Isotope Research and Processing

BNL Bldg. #: 801 **Grid #:** 65 **Site #:** 10302.002527

Date of construction or period of use: Construction: 1950 (Operating history: 1950 – present)

Historic Significance Category: ☐ **I or** ☒ **II or** ☐ **N/A**

Historic Role(s): *Scientific achievement, Engineering/design*

- Associated with BGRR and early BNL operations
- Development of radioisotopes
- Determined eligible for listing on the National Register of Historic Places in 1999 as part of the BGRR complex

Current Significant Feature(s): (Examples: exterior architecture; extant location; associated w/important personage; scientific achievement [e.g.; Nobel Prize]; unique facility; etc.)

-- Extant building associated with BGRR complex.

Plans for Bldg or Site:

- The building continues to be utilized to support BNL program areas, including isotope processing. There are no plans to decommission this building at this time.

Treatment and/or Mitigation Plans:

- The mitigating actions identified in the BGRR MOA also encompass the Hot Laboratory. These actions include archiving documentation and building plan drawings.
- Acknowledge building in CRMP, CR tours, etc.
- Future architectural revisions (renovations/additions/removals) would be planned in order to minimize the impact to the building visual lines. For example:
  - Additions would follow existing architectural lines and similar colors, or be sufficiently distinct in order to differentiate original structure from new.

Level A *(achieved, in-progress, or relatively achievable)*

- BGRR History Video (includes living history interviews) - complete
- Records inventoried by professional archivist (Retain photos & drawings) – completed
- BGRR Researchers Guide – 70 % complete
- Identify tools & equipment for potential display/preservation
- Have architectural evaluation performed to identify specific features/treatments - completed

Cultural Resource Management Strategy Form

Building/Site Name: Medical Research Center/Program

BNL Bldg. #: 490 **Grid #:** 84 **Site #:** 10302.002411

Date of construction or period of use: Construction: 1958 (Operating history: 1958 - present)

Historic Significance Category: ☒ **I or** ☐ **II or** ☐ **N/A**

Historic Role(s): BNL's development history; scientific achievements

- Nuclear medical research program initiated in 1950. New facility (constructed in 1958) expanded program

Current Significant Feature(s): (Examples: exterior architecture; extant location; associated w/important personage; scientific achievement [e.g.; Nobel Prize]; unique facility; etc.)

-- Scientific achievements: Development of radioisotopes for medical applications; technetium-99m, L-dopa treatments, BNCT, thallium-201, tin-117m DPTA, positron emission tomography

Plans for Bldg or Site:

- Extant building is still in use in support of scientific programs as a center for conducting medical studies and research. Note: The building is not considered the significant feature of this resource.

Treatment and/or Mitigation Plans:

- Identify & preserve information related to the scientific achievements of the medical research program - not the building.
- Identify key pieces of equipment potentially representative of select experimental programs.

Level A *(achieved, in-progress, or relatively achievable)*

- Research & develop information regarding significance of medical research.
- Identify & evaluate potential equipment artifacts for future display – ceremonial groundbreaking flask/plaque identified.
- Retain MRI machine displayed in Chemistry Bldg lobby.
- Retain photos & drawings.

Level B *(resource permitting)*

- Conduct 'Living History' interviews
- Records search & archive

Cultural Resource Management Strategy Form

Note: Sensitive Information - Do Not Distribute -

Building/Site Name: Weeks Campbell Site

BNL Bldg. #: None **Grid #:** 70 & 80 **Site #:**

Date of construction or period of use: Late 1800 to early 1900s

Historic Significance Category: ☒ **I or** ☐ **II or** ☐ **N/A**

Historic Role(s): Historical archeology site;

Current Significant Feature(s): (Examples: exterior architecture; extant location; associated w/important personage; scientific achievement [e.g.; Nobel Prize]; unique facility; etc.)

-- Above grades structures are no longer visible, however, stone foundation, brick walkway/patio remains. Site likely contains buried artifacts that provide evidence of rural life in the late 1800s.

-- Site has a relatively high degree of integrity, with several surface and subsurface features (agricultural landscape markers, the brick walkway, and most importantly, the foundation/cellar hole)

-- The site can speak to research questions regarding late nineteenth century rural domestic lifeways of what was likely an agrarian family; also, the site yielded evidence of military occupation, probably World War I era, so it might be important as a "satellite" site (even if not used for an official Army function) of Camp Upton

Plans for Bldg or Site:

- None; maintain and protect site for potential future research study

Treatment and/or Mitigation Plans:

- Conduct preliminary archeological survey/evaluation of potentially threatened site – completed 2004.
-

Level A *(achieved, in-progress, or relatively achievable)*

- Research house site history – Completed as part of archeology evaluation.
- Develop & implement monitoring plan for site, as determined necessary.

Level B

- Development impinges on the area, a Phase III archeological data recovery project may need to be performed.

Cultural Resource Management Strategy Form

Note: Sensitive Information - Do Not Distribute -

Building/Site Name: W. J. Weeks House Site

BNL Bldg. #: None **Grid #:** 70 & 80 **Site #:**

Date of construction or period of use: Mid 1800s

Historic Significance Category: ☒ **I or** ☐ **II or** ☐ **N/A**

Historic Role(s): Historical archeology site;

Current Significant Feature(s): (Examples: exterior architecture; extant location; associated w/important personage; scientific achievement [e.g.; Nobel Prize]; unique facility; etc.)

-- Above grades structures are no longer visible, however, stone foundation (or partial) remains. Locust fence posts (3 to 4) remain. Site likely contains buried artifacts that provide evidence of life in the 1850s.

-- Age, density and diversity of artifacts, along with intact subsurface features suggest high research potential research topics: lifeways of otherwise "undocumented" people, in this case, tenant woodchoppers; socio-economic issues of non-land holding lower class in nineteenth century rural setting.

Plans for Bldg or Site:

- None; maintain and protect site for potential future research study

Treatment and/or Mitigation Plans:

- Conduct preliminary archeological survey/evaluation of potentially threatened site – completed 2004.
- Implement protection plan for site to prevent unauthorized excavation – completed in 2004 (fencing & signs)

Level A *(achieved, in-progress, or relatively achievable)*

- Research house site histories – Completed as part of archeology evaluation.
- Develop & implement monitoring plan for site, as determined necessary.

Level B

- If development impinges on the area, a Phase III archeological data recovery project would need to be performed.

Cultural Resource Management Strategy Form

Note: Sensitive Information - Do Not Distribute -

Building/Site Name: World War I Camp Upton Foundations & Features

BNL Bldg. #: None **Grid #:** 53, 57, 63, 67, 73, 77, 78, 107 **Site #:**

Date of construction or period of use: 1917 –1929

Historic Significance Category: ☒ **I or** ☐ **II or** ☐ **N/A**

Historic Role(s): Constructed in 1917-1918 as part of Camp Upton during WW I

- Likely to be eligible for listing on the National Register of Historic Places due to association with Camp Upton (based on contactor's evaluation)
- Associated with historic pattern of events – mobilization & training of U.S. Army troop during WW I.

Current Significant Feature(s): (Examples: exterior architecture; extant location; associated w/important personage; scientific achievement [e.g.; Nobel Prize]; unique facility; etc.)

-- Four to five separate sites of foundations are extant.

-- These sites may be the only remaining examples of WWI Cantonment features remaining in the U.S. (None of the 16 WW I National Army Cantonments is currently listed on the National Register.)

-- High degree of integrity with respect to location, design, materials and association - offers a rare opportunity to study this aspect of military history.

Plans for Bldg or Site:

- Maintain sites in current state with surrounding wooded buffers.

Treatment and/or Mitigation Plans:

- Maintain areas in their current state; available for study/interpretation.
- If development threatens a specific site—perform archeological survey of impacted area.

Level A *(achieved, in-progress, or relatively achievable)*

- Survey and map foundation areas – completed 95% in 2002.
- Acknowledge and describe sites on CRM webpage.

Level B *(resource permitting)*

- Map newly identified features using GPS.

Cultural Resource Management Strategy Form

Note: Sensitive Information - Do Not Distribute -

Building/Site Name: World War I Training Trenches

BNL Bldg. #: None **Grid #:** 21, 22, 35, 36, 43, 46, 47, 48, 53, 113 **Site #:**

Date of construction or period of use: 1917 – 1918

Historic Significance Category: ☒ **I or** ☐ **II or** ☐ **N/A**

Historic Role(s): Constructed in 1917-1918 as part of Camp Upton for trench warfare training
Determined to be eligible for listing on the National Register of Historic Places
Associated with historic pattern of events – mobilization & training of U.S. Army troop during WW I.

Current Significant Feature(s): (Examples: exterior architecture; extant location; associated w/important personage; scientific achievement [e.g.; Nobel Prize]; unique facility; etc.)

Eleven separate sites of trench networks are extant. (Complexity of each network varies from a single trench to intricate patterns similar to Army field manual diagrams)
These sites are some of the few remaining examples of WW I trench earthworks in the U.S.
High degree of integrity with respect to location, design, materials and association - offers a rare opportunity to study this aspect of military history.

Plans for Bldg or Site:

- Maintain sites in current state with surrounding wooded buffers.
- NOTE: The area encompassing Trench #6 has been designated for preservation as part of the LEED (Leadership in Energy & Environmental Design) program for the Center for Functional Nanomaterials and the Research Support Building. Accordingly, this area is to be preserved as a natural area for the life of these buildings.
- Develop tour program for a select site(s), with interpretive signage.

Treatment and/or Mitigation Plans:

- Maintain site in its current state, and make available/accessible for cultural resource tours.
- Develop management plan to include periodic assessment
- If development threatens a specific site—perform archeological survey of impacted area.
- Submit nomination documents to have trenches listed on National Register

Level A *(achieved, in-progress, or relatively achievable)*

- Survey and map trench networks – completed in 2002.
- Select specific site(s) (1 or 2) for supervised Cultural Resource tours. Tours can be initiated with sites in current state (e.g. accessibility improvements & signage not immediately necessary).
- Develop specific management plan that includes periodic physical assessment, security, etc.

Level B *(resource permitting)*

- Improve accessibility

Additional Information:

- Two trench sites (near the current RHIC facility) identified in mid-1970s were assigned site no. A10302.000474 by the NYSHPO

Appendix D

Cultural Resource Management Plan – Action Items

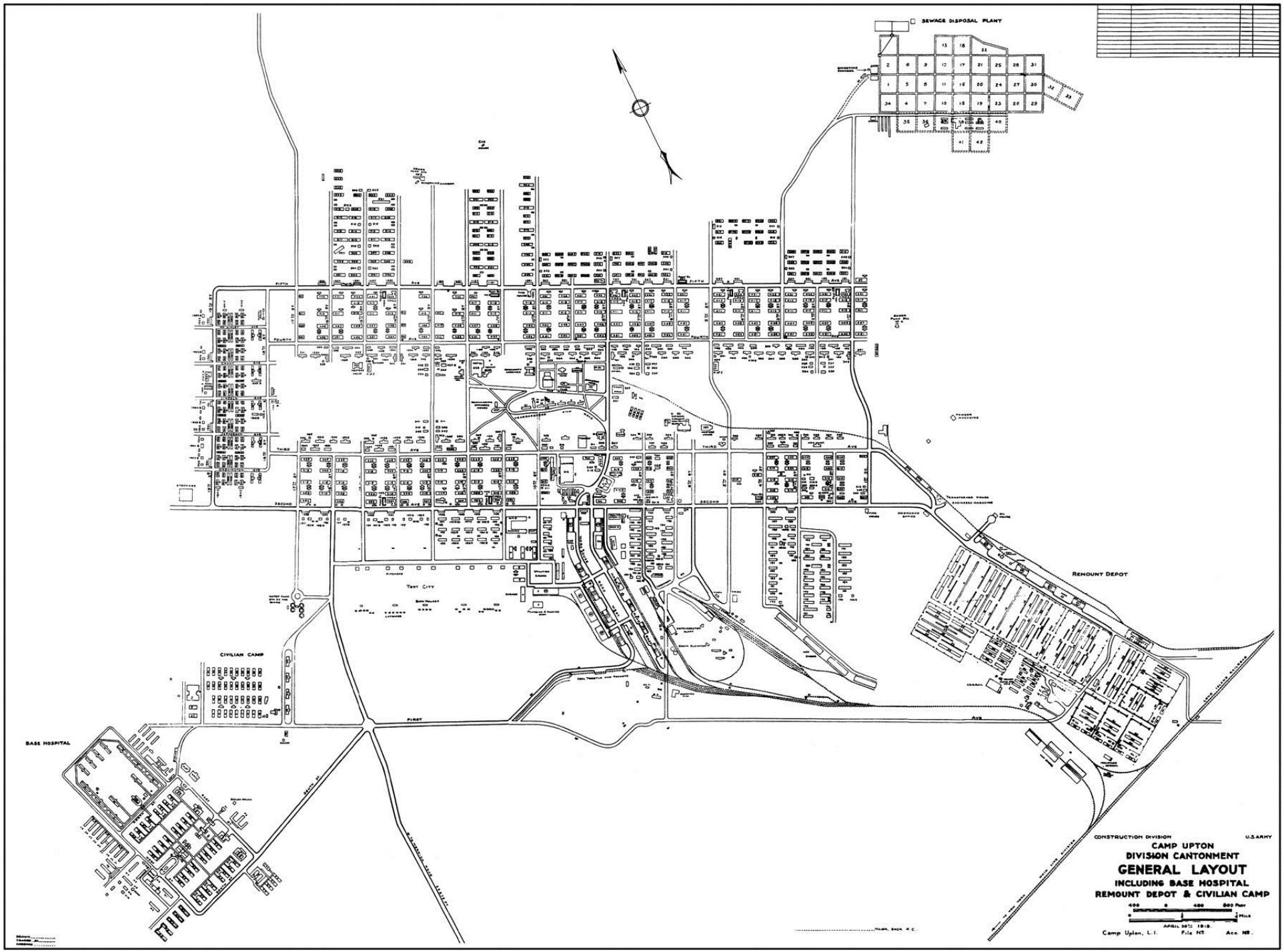
Note: Shaded cells indicate completed tasks.

Item #	Action Item	Priority	Status/Action Taken
1	Perform archeological evaluation of 1850's house sites	A	Performed in 2004
2	Following archeological evaluation, implement protection of 1850's house site(s), as determined necessary	A	Fencing erected & signs posted in 2004
3	Develop a Cultural Resources Management subject area.	A	Not necessary at this time
4	Coordinate with Facility and Operations personnel to identify appropriate CR review flags/checks and incorporate them into existing programs and procedures such as the ESH-500 form, Digging Permit, maintenance management system, etc.	A	- Added CR flags in Maximo & ESH-500 Form - IFM engineers informed
5	Develop cultural resource training; target specific groups such as Integrated Facility Management supervisors and engineers, security, fire, EM engineers, work control planners, etc.	A	Training conducted in 2012, Training needs to be updated and provided to F&O and ESH Coordinated Group
6	Complete BGRR mitigation actions identified in the MOU as resources permit (prepare a Researchers Guide and a list of tools and equipment needed for evaluation or Curation.	A	BGRR equipment artifacts were relocated to storage in 2008/2009.
7	Complete mitigation actions identified in the MOA for the 1960s era apartments (kiosks)	A	
8	Complete mitigation actions identified in the MOA for the BMRR stack demolition	A	
9	Integrate CR management strategy into BNL planning and maintenance programs	A	Partially met by adding NRE buildings to F&O 500A forms
10	Include Major CR accomplishments in annual Site Environmental Report	A	Ongoing
11	Working with Stake Holder Relations, determine long-term storage needs for BNL press release and newsletter archives	B	
12	Evaluate architectural features of Chemistry Building, Berkner Hall, and other identified structures (Buildings 701,703, 801, 750, 120, etc.) as appropriate (Pending available funding)	B	Completed in 2004 (Ref. March 2005 Annual review for details)
13	Have an assessment performed to evaluate BNL's scientifically significant facilities (Pending available funding).	B	Completed 2019-2022
14	Implement Historic Resource Identification Tag program	B	Procedure developed in 2004; Needs cont. implementation
15	Develop a cultural resource tour program, including talking-points script and visuals	B	Completed in 2005, Work with Stakeholder Relations to Update
16	Develop CR presentation and display materials	B	Posters, presentations developed on Trenches, BNL Site History; ongoing development/refinement
17	Evaluate the appropriate means of establishing a catalog/accession/labeling/storage system for CR material and records recovered during formal surveys, old "finds" retained by individuals, and new discoveries	B	
18	Consolidate storage for all CR material.	B	

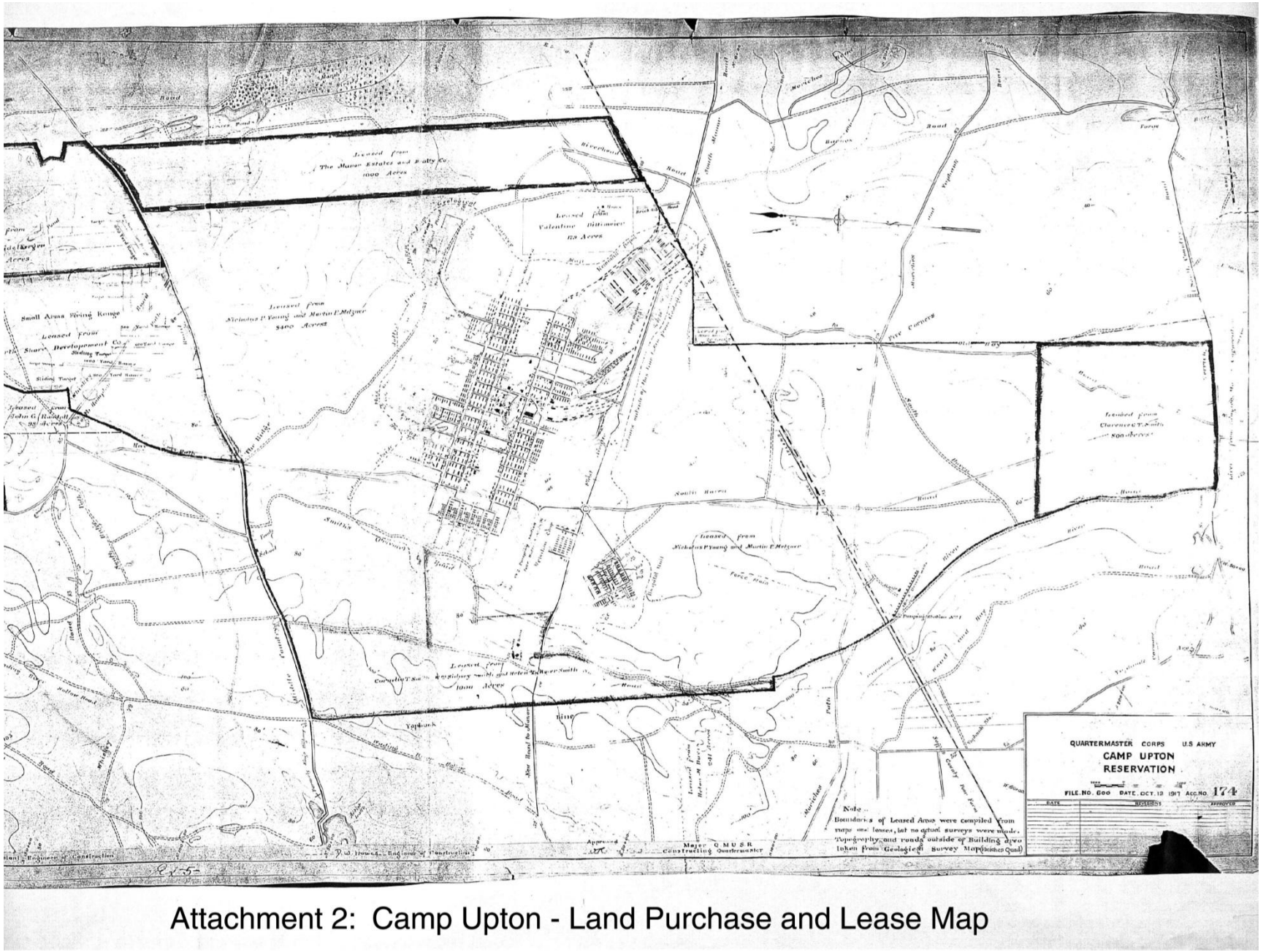
Item #	Action Item	Priority	Status/Action Taken
19	Evaluate the need to establish a contract or MOA with a qualified institution for curation of material, periodic assessment of curation methods at BNL, or the value in becoming a designated repository	B	
20	Obtain official site number for WW I Camp Upton Features from NYSHPO	B	SHPO assigned Site No. A10302.002771
21	Complete site forms for other BNL CR sites	B	
22	Identify location and content of the oral histories.	B	
23	Develop a formal Collections Management Policy to guide future decisions, such as how and what the collection will contain, processes for accepting items into collection, loans, de-accessioning, etc.	B	
24	Facilitate loan of item, when requested, to museums following BNL's Loan Agreement requirements.	B	On going
25	Update architectural management documents to identify specific features and treatments for NRE structures and buildings	B	Architectural mgmt. plan developed in 2005, treatment documents need updating
26	The Camp Upton Collection has been moved multiple times and items had been removed without documentation. A full re-inventory needs to be completed.	B	
27	Establish a logbook system to document item removal/return associated with loan of items.	B	
28	Develop a program for periodic environmental monitoring and inspection of Camp Upton collection and other CR collections.	B	
29	Develop evaluation/protection/maintenance plans for the scientifically significant equipment on display	B	
30	Interact with local historical societies and participate in internal/external outreach opportunities; offer presentations on BNL History and the BNL CRMP. This item is expected to be ongoing.	B	77th Division Casing of Colors ceremony – Sept. 2008; Small group tours performed; Refer to Attachment 13.
31	Develop procedure(s) for periodic monitoring and inspection of cultural resources to identify potential damage due to natural, unauthorized or illegal actions	B	
32	Evaluate the potential effects of wildland fires on cultural resource areas and develop appropriate documentation (Section 106, Procedure(s), MOA, etc.) to address issues identified in DOE G 450-1.4 *Wildland Fire Management Program*	B	
33	Map (using GPS, NearMap, or Hillshade data) old roads & trails	B	Initiated in 2004; No action in 2005-2009
34	Document history of old roads/trails & incorporate in CRM program	B	
35	Include planning of pre and post cultural resource surveys in prescribed fire areas	C	Incorporated in NRMP
36	Research histories of 1800s house sites - submit files to SHPO	C	
37	Confirm that Smithsonian Institute has a 'C' – Magnet(s) in their collection	C	Confirmed during preparation of BNL 75th Anniversary History displays Long Island Museum
38	Develop a system for acquiring, storing, and accessing originals or copies of reports, documents, and other written materials that concern BNL cultural resources (i.e., develop the CR Library).	C	

Item #	Action Item	Priority	Status/Action Taken
39	Develop methods to ID historic or supporting resources (video/photo/written) identify responsible persons, ensure proper storage.	C	
40	Digitize photo archives	C	
41	Develop a bibliography/searchable database of current BNL cultural resources related documents	C	
42	Replace existing Website with updated new site.	C	
43	Incorporate site forms and numbering system into an ESH&Q SOP(s)	C	
44	Map newly identified WW I foundations & trenches using GPS or Hillshade data	C	
45	Complete inventory forms for newly identified WW I trenches	C	
46	Evaluate options related to improving fire code related issues and fire detection/suppression systems for CU Collection	C	
47	Evaluate the potential for establishing a more permanent area for rotating display themes of Camp Upton Collection items	C	Periodic displays are established in Berkner Hall
48	Develop list of key figures in BNL's scientific history for interview	C	
49	Develop procedure for triggering and conducting oral histories of employees retiring with 20+ years of service	C	
50	Develop a monitoring plan for the WW I trenches	D	
51	Formalize CU Collection catalog and storage system by incorporating directly into a BNL procedure, or by reference	D	
52	Evaluate the potential to have assessments performed by qualified outside organizations via contract or cooperative agreement	D	
53	Develop brief descriptions of the additional CR assets listed in Attachment 7 and add to CRMP	D	
54	Develop Researcher's Guide to AGS Complex Facilities and Scientific Research	D	
55	AGS facility records search and archive	D	
56	Perform actions identified on BMRR CR management strategy form	D	
57	Perform actions identified on HFBR CR management strategy form	D	Identified and relocated equipment artifacts from HFBR to CR storage area
58	Consider establishing a CR Advisory Group and/or Interest Group	D	
59	Document history of Civilian Conservation Corp period (1930s) at BNL site	D	Fact Sheet developed in 2007.

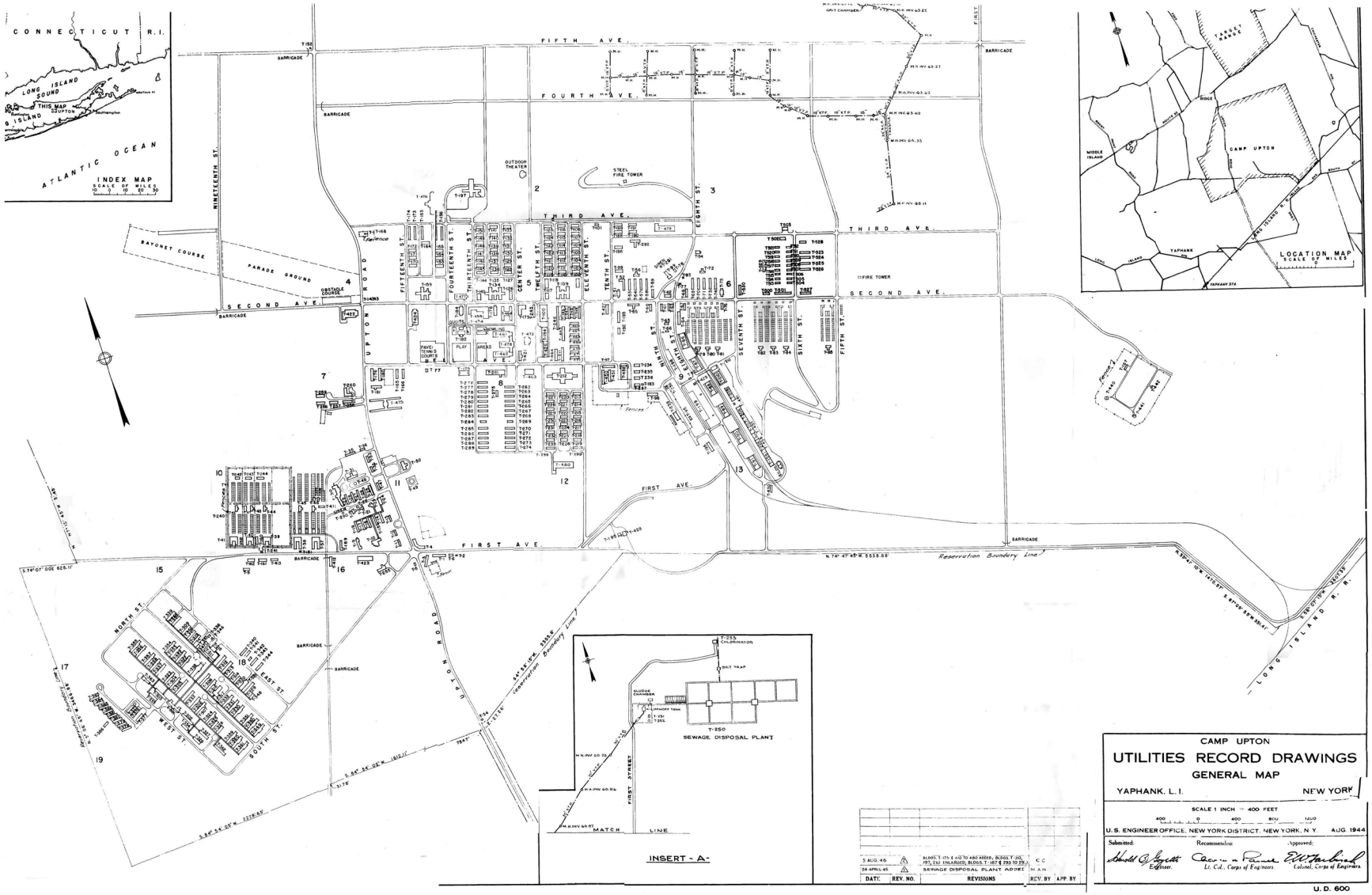
ATTACHMENTS



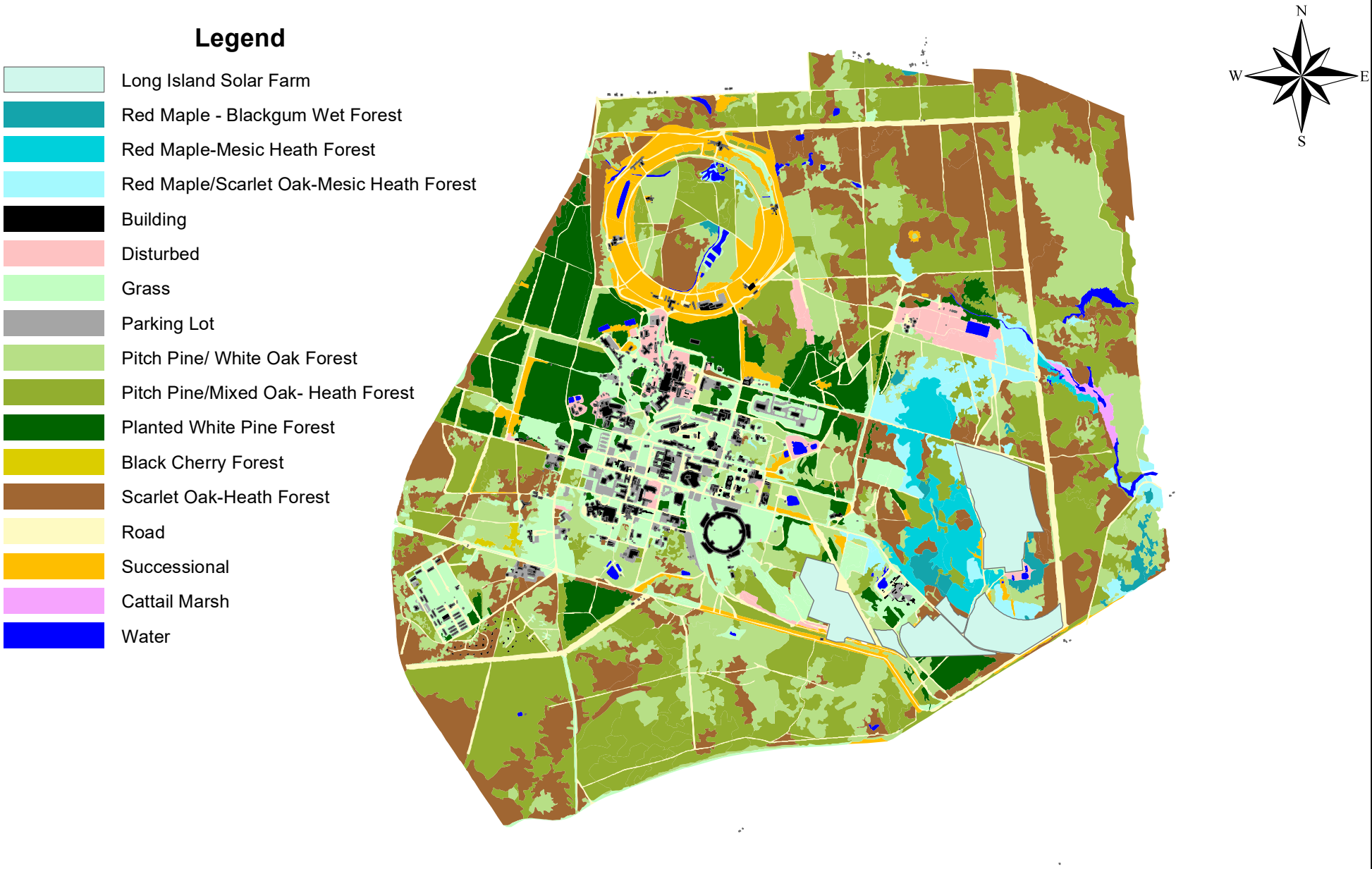
Attachment 1: Map of World War I Camp Upton



Attachment 2: Camp Upton - Land Purchase and Lease Map



Attachment 3: World War II Camp Upton Map



Brookhaven National Laboratory

Attachment 4
BNL Vegetation Map

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Feet

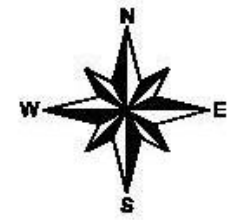
Environmental Protection Division

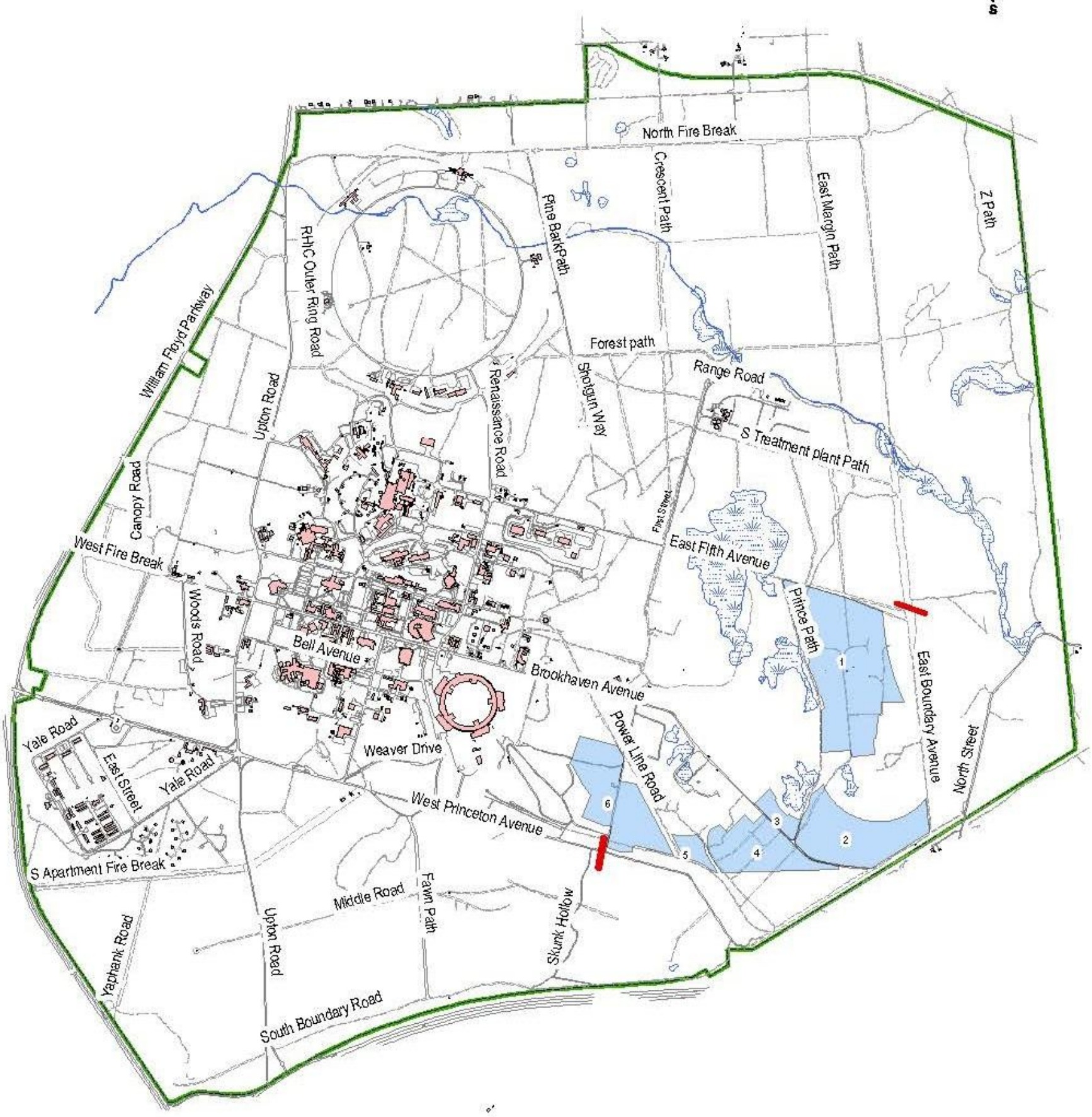
JLH - 10/14/2021

Attachment 5:

BROOKHAVEN NATIONAL LABORATORY

Buildings and Roads





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Feet

Environmental Protection Division

Legend

- Solar Farm
- Wetlands
- BNL Boundary
- Buildings
- Locked Gate

jlh-06/1/12

Full Catalog Available by Request

Attachment 7 BNL Cultural Resources

BNL CR ID	*Type*	*Period*	*Name*	*Description*	*NRHP*	*Comments*
BNL-CR-01	site	Historic	Weeks Campbell Site	Late 19th -early 20th century site	L	Reference CRM Project # CRP-2004-2
BNL-CR-02	site *&* objects	Historic	Wheel & Hub	Steel wheel *&* hub assembly	U	Artifacts identified in 2002
BNL-CR-03	objects	Historic	Camp Upton Collection	Collection of WWI & WWII artifacts *&* donated items	U	Other database lists CU Collection items
BNL-CR-04	sites	Historic	WWI Training Trenches	10 networks of trench warfare training	Y	Reference CRP KRP-2002-02 for earthworks detail
BNLCR-05	sites	Historic	WWI foundations & structures	Areas of Camp Upton building foundations & other structures	L	Reference CRP #CRP-2002-02 for detail
BNLCR-06	building	Historic	Grain silo bases	Concrete bases from 2 WWI Camp Upton silos	U	Building 482 – Section 106 package covering demolition for NSLS-II construction
BNLCR-07	building	Historic	Brick building (Bldg 455)	Brick structure circa WWI Camp. Upton - 1917	U	Substantial modifications
BNL-CR-08	feature	Historic	White Pines	Stands of white pine trees planted by CCC	U	Approximately 400 acres
BNL-CR-09	building	Historic	Building 30	Building extant to CCC *&* WWII Camp Upton	N	Historic significance for use in three periods of history
BNL-CR-10	building	Historic	Building 120	Barracks building WWII Camp Upton	N	Minimal exterior renovations
BNLCR-11	complex	Scientific	Graphite Reactor (BGRR)	7 buildings assoc. with first non-weapons Complex research reactor	Y	Determined NRHP eligible in 2000.
BNLCR-12	complex	Scientific	High Flux Beam Reactor (HFBR) Complex	6 buildings assoc. with BNL's 2nd generation research reactor	Y	Determined NRHP eligible in 2001

BNL CR ID	*Type*	*Period*	*Name*	*Description*	*NRHP*	*Comments*
BNL-CR-13	site	Scientific	Gamma Forest site	Site includes structures/equip & visible effects of radiation on plant Life	U	
BNL-CR-l4	site	Scientific	Cosmotron Site (Bldg 902)	Outline of Cosmotron Ring visible on Floor of Bldg. 902	U	
BNL-CR-15	object	Scientific	Cosmotron C-Magnet	One section of an actual magnet Mounted outside of Bldg. 911	U	
BNL-CR-16	object	Scientific	Cosmotron scale model	Scale model of Cosmotron	U	In storage basement of Bldg. 703
BNL-CR-17	object	Scientific	HFBR scale model of Bldg. 750	Scale model of HFBR dome w/ cutaway view to interior	U	In storage basement of Bldg. 703
BNL-CR-18	object	Scientific	HFBR scale model of Biological shield	Scale model of HFBR bio shield & vessel	U	In storage basement of Bldg. 703
BNL-CR-19	object	Scientific	HFBR dummy fuel element	Non-fueled, actual size & material element	U	IAEA Program (R. McNair) Bldg. 400D
BNL-CR-20	object	Scientific	BGRR Scale model	Scale model of BGRR	U	In storage basement of Bldg. 703
BNL-CR-21	objects	Scientific	BNL photo negative archive	Photo negatives from 1947 to present	U	Index of negatives lists individual photo, CR program copy available Negatives in Bldg. 493
BNL-CR-22	objects	Scientific	BNL Bulletin & press Releases	Copies of BNL's weekly newsletter & Press releases	U	Archives maintained in Bldg. 400 recent ones available electronically
BNL-CR-23	object	Historic	World War II mural	Partial Mural from WW II in non-Commissioned officer's club	U	Attic portion of Bldg 197
BNL-CR-24	objects	Scientific	BGRR document archives	BGRR documents catalogued and Archived. Includes design, operation & experiments	?	Index and Researcher's Guide available. Documents sent to permanent archives in 2012
BNL-CR-25	object	Scientific	BGRR History Video	Video describes design/construction/ Research; interviews w/former Scientists and engineers	?	Part of BGRR D&D mitigation Available on BNL website.

BNL CR ID	*Type*	*Period*	*Name*	*Description*	*NRHP*	*Comments*
BNL-CR-26	building	Historic	W.J. Weeks house site	Circa 1850s house site	L	Reference CRM Project #CRP-2004-2
BNL-CR-27	object	Scientific	31” Bubble Chamber	small bubble chamber	U	Stored outside near Bldg. 438
BNL-CR-28	object	Scientific	HFBR CNF H9 beam plug	HFBR Cold Neutron Facility Beam plug	U	Stored outside near Bldg. 438
BNL-CR-29	object	Scientific	7’ Bubble Chamber glass Window	Large borosilicate glass window	U	Stored outside near Bldg. 438
BNL-CR-30	object	Scientific	T. Goldhaber’s model	3D model of isomer excited states	U	Mounted on wall of Bldg. 510 lobby
BNL-CR-31	object	Scientific	Tandem van der Graff Model	Scale model of Tandem van der Graff	U	Utilized for for tours in Bldg. 901E (C. Carlson)
BNL-CR-32	object	Scientific	Graphite Block	6” x 12” example of BGRR graphite	N	IAEA Program (R. McNair) Bldg. 400D
BNL-CR-33	object	Scientific	BGRR Control Room Instrument panels mockup	3 Sections of Control Room instrument panels w/ actual inst.	N	BGRR Artifact, Bldg. 703 west Basement
BNL-CR-34	object	Scientific	BGRR Control Rod Position indicator panels	Actual Instruments from BGRR control room	N	BGRR Artifact, Bldg. 703 west Basement
BNL-CR-35	object	Scientific	BGRR dummy fuel element 11ft. long	Aluminum, actual size	N	BGRR Artifact, Bldg. 703 west basement
BNL-CR-36	object	Scientific	BGRR Fuel element 2 – 1 ft. long	2 types of elements, mounted on wood plaque	N	IAEA Program (R. McNair) Bldg. 400D
BNL-CR-37	object	Scientific	BGRR sample tubes (rabbits)	Aluminum tubes for sample irradiation Case of ?	N	BGRR Artifact, Bldg. 703 CR cage
BNL-CR-38	object	Scientific	BGRR status blackboard	2, slate backboards used for Communicating operational status	N	Bldg. 703 CR cage

BNL CR ID	*Type*	*Period*	*Name*	*Description*	*NRHP*	*Comments*
BNL-CR-39	object	Scientific	Atoms for Peace Sign	4’ x 7’ sign Central Staircase of Bldg. 703 Lobby	N	BGRR Artifact, Bldg. 703
BNL-CR-40	building	Architectural	Chemistry Building	Designed by renowned architect Marcel Breuer	L	Reference CRP-2004-1
BNL-CR-41	building	Architectural	Berkner Hall	Designed by renowned architect Max O. Urbahn	L	Reference CRP-2004-1
BNL-CR-42	object	Scientific	Ceremonial Flask	Flask/plaque from Medical Research Center ground breaking	N	Medical Dept. possession
BNL-CR-43	object	Scientific	BGRR On-shift staff Board	Wood status board w/name tags	U	BGRR Artifact, Bldg. 703 West Basement
BNL-CR-44	object	Scientific	HFBR NSS Instrument Chassis	Nuclear Safety Systems Instrument	U	HFBR Artifact, IAEA Program (R. McNair), Bldg. 400D
BNL-CR-45	object	Scientific	PET Scan Device	PET scan device, encased in Plexiglass	U	Displayed in Chemistry, Bldg. 555 Lobby
BNL-CR-46	object	Scientific	BMRR Scale Model	Medical Research Reactor model	U	Stored in BMRR Treatment Room
BNL-CR-47	object	Scientific	7’ Bubble Chamber	Large Bubble chamber	U	Stored outside near Bldg. 438
BNL-CR-48	object	Scientific	Bubble Chamber camera Tube	Camera tube for bubble chamber	U	Stored outside near Bldg. 438
BNL-CR-50	object	Scientific	Hot Cell Models	Model of Bldg. 830 Hot Cells	U	Model in Lobby of Bldg. 830
BNL-CR-51	object	Scientific	BGRR Bldg Model	Model of Bldgs 701 & 702	U	Model in Bldg. 703 CR cage
BNL-CR-52	object	Historic	Axe Head	Hand forged axehead from LISF	U	Axe head currently in Bldg. 120 Rm 1-48
BNL-CR-56	object	Historic	Quartz Flake	Quarter sized worked flake likely of Native American origin	U	Artifact held by Institute for Long Island Archaeology

N
W
E
S

Legend

Buildings Eligible for Listing on NRHP

Architectural or Historic Period Significance

0 1,000 2,000

Feet

*Note: Sensitive Information Not Shown

[redacted]

Environmental Protection Division

Attachment 8
Map of Cultural Resource Areas, Sites, and Buildings

JLH - 4/6/23
r:/arcmap_projects/crmp/att8_r2.mxd

Cultural Resource Projects *Attachment 9*

CRPID#	*Name*	*Description*	*Performed By*	*Comments*
CRP-1999-01	Cultural Resource Programmatic Agreement	Develop draft PA between DOE and Advisory Counsil on Historic Preservation	C. Kielusiak	PA Drafted but not finalized. DOE decided to develop CRMP.
CRP-2000-01	BNL Architectural Inventory	Evaluated BNL buildings and structures for NRHP eligibility potential IAW NHPA Section 110	ILIA	Produced the Architectural Inventory of the Brookhaven National Laboratory
CRP-2000-02	BGRR Document Inventory	Inventory all BGRR documents, appraise to SAA stds and NARAIDOE retentions; catalog in a searchable database; develop descriptions; prep documents for transfer to BNL RHA	S. Kalamaris	Ref. Webreq 40605; produced final report dated 12/2001
CRP-2000-03	BGRR History Video	R. Crease Interviews BGRR designers/engineers/scientists + historic photos	BNL	Distributed in 2003
CRP-2000-04	Historic Film Reel Conversion	Converted historic 16-mm film reel footage to high quality tape & developed database listing	AdwarVideo	Listing of 19 tapes placed on Cultural Resources website
CRP-2001-01	Historic Context & Archeological Sensitivity	Developed historic contexts for BNL and assessed potential for arch. finds.	ILIA	Cultural Resources Inventory of BNL, including Archival Search, Prehistoric and Historic period Contexts, and Archeological Sensitivity Assessment
CRP-2002-01	Evaluation of WWI Features	Mapped trenches, foundations & other features; Determined NRHP eligibility; recommended preservation and restoration concepts	ILIA	
CRP-2002-02	Camp Upton Collection Catalog & Inventory	Cataloged & labeled 2040+ items; organized and stored items in museum std materials. Est. database w/ accession, collection & photo tables. digi tally photographed ea item	C-S-V Assoc.	
CRP-2003-01	CR Management Methods and Procedures Assessment	Identified requi rements & recommended methods for compliance with CRM laws & regulations	ILIA	
CRP-2003-02	Archeological Field Survey Requirements Assessment	Identified need and scope of archeological surveys and areas where surveys are recommended.	ILIA	
CRP-2003-03	Archeological Field Survey for FHWMF Rail spur	Performed Stage I Archeological Survey of route of new rail spur	ILIA	

CRPID#	*Name*	*Description*	*Performed By*	*Comments*
CRP-2004-01	Architectural Eva! – Chemistry Bldg; Berkner Hall	Performed architectural survey & NRHP evaluation of Bldgs 555 & 488; Assisted w/ developing mgmt strategies for other CR buildings	PAL	(PAL) Public Archeology Associates, of Rhode Island
CRP-2004-02	Archeological Evals of 1800s House Sites	Performed archaeological evaluation of W. J. Weeks House site and Weeks/Campbell Site	ILIA	
CRP-2004-03	Protective Fencing	Installed protective fencing & warning signs around W.J. Weeks House site	BNL	
CRP-2007-01	Archeological Field Survey of NSLS-II Construction Site	Performed a Stage I Archaeological survey of the Proposed National Synchrotron Light Source II construction site.	ILIA	
CRP-2009-01	Stage 1B Archaeological survey and Data Recovery Privy Site	Performed a Stage 1B Archeological Survey and Data recovery for the Privy Site located in the northern portion of the proposed BP Solar Solar Farm	ILIA	
CRP-2009-02	Archeological Field Survey of WWI area impacted by Solar Farm	Performed a Stage I Archaeological survey of the WW I Remount facility within the footprint of the proposed BP Solar Solar Farm	ILIA	
CRP-2016-01	Archeological Field Survey of Proposed Discovery Park	Performed a Phase 1 Archeological survey of the Discovery Park Area, area surrounding Apartment complex.	Louis Berger	
CRP-2016-02	Architectural Survey of Proposed Discovery Park	Performed Architectural Survey of buildings 364, 365, 366, 367 (1960s -era efficiency apartments.) and WW I cement roads	Louis Berger	Apartments determined to be National Register Eligible, cement roads determined ineligible
CRP-2018-01	Architectural Survey of Proposed Discovery Park	Section 106 (Recordation Package) developed for 1960s era efficiency apartments as part of mitigation for planned demolitions.	Louis Berger	
CRP-2019-01	Architectural Survey of scientific buildings	Survey of Scientific Buildings greater than 50 years, formal evaluation of Medical Complex, AGS Complex, WW II water tower, 30, 120, 455, 488, and other buildings not previously assessed.	Hartgen Archeological	Multiple buildings determined to be National Register Eligible STO-0049, 120, 488, 490, 491, 510, 515, 535, 820, 820A, 820B, 830, 901, 901A, 902, 911, 912, 913, 913A-E, 930

CRPID#	*Name*	*Description*	*Performed By*	*Comments*
CRP-2020-01	Architectural Survey	Recordation of WW II Water Tower	Hartgen Archeological	
CRP-2021-01	Architectural Surveys	Survey of remaining buildings, infrastructure, and land features over 50 years of age including electrical, steam, water, sewer, storm, ditches, gamma forest, CCC plantings, and roads and parking lots	Hartgen Archeological	
CRP-2022-01	Architectural Survey	Section 106 (Recordation Package) BMRR Stack	Hartgen Archeological	

Attachment 10

NHPA Section 106 Reviews, Architectural and Archeological Surveys

Note: This listing will be updated periodically.

- 1981 – Historic and Natural Districts Inventory Form completed by Town of Brookhaven and the Society for Preservation of Long Island Antiquities.

- 1999 - Brookhaven Graphite Research Reactor (BGRR) Complex. Determined to be eligible for listing in the National Register of Historic Places (NRHP eligible).

- 1999 - Storage Building 577. Determined to be ineligible.

- 2000 – Architectural Inventory of 448 structures by Institute for Long Island Archeology (Bernstein 2001a).

- 2004 – Architectural Evaluations – Chemistry Building, Berkner Hall, and other historically significant structures. Work helped develop treatments.

- 2001 - High Flux Beam Reactor (HFBR) complex. Determined to be NRHP eligible.

- 2002 - Building Demolition Project Section 106 packages:
    - Buildings 89, 90, and 91 (warehouses). Determined to be ineligible.
    - Buildings 93 and 168 (well houses). Determined to be ineligible.
    - Buildings 194 (warehouse/offices). Determined to be ineligible.
    - Building 318 (Oceanography Dept.). Determined to be ineligible.
    - Building 324 (apartment #9). Determined to be ineligible.
    - Building 426 (labs/offices). Determined to be ineligible.
    - Building 428 (trash incinerator). Determined to be ineligible.

- 2003 - Building Demolition Project Section 106 packages:
    - Buildings 118, 184, 185, 206, 207, 208, 209, 457, 458, and 459. All determined to be ineligible.

- 2005 - Building Demolition Project Section 106 packages:
    - Buildings 193 (Credit Union), and 527. Determined to be ineligible.
    -

- 2006 – Determination of Effects Finding, High Flux Beam Reactor Decommissioning

- 2006 – A Section 106 review of the remaining Camp Upton era buildings was performed with the expectation that these structures would be demolished over the course of the next 10-15 years. These 75 structures were determined not to be eligible for listing in the National Register. This affirmed and documented SHPO's visual evaluation, made during a 2003 site visit, that due to the amount of alteration, reconfiguration and relocation, the structures do not retain enough integrity to convey their historic function and none of the Camp Upton era buildings were eligible for listing.

Building #	Name	Year Built	Grid #
	Administrative Functions		
0050	Police Headquarters	1941	94
0051	Environmental Restoration	1934	73
0097	Maintenance Management Center	1941	85
0129	Science Museum Staff & NSLS Offices	1942	75
0130	Engineering/Safety & Risk Technology	1941	74
0134	Plant Engine/Pub.Affairs/Fiscal/Inter.Audit	1941	74
0179	Staff Services/EENS/Post Office	1941	84
0185	Human Resources/Diversity Office	1942	85
0197	NNSD/Graphic Arts/NNDC	1941	74
0211	Procurement & Property Management	1941	86
0326	Site Maintenance Office	1943	102
0355	Users Center/PPM	1943	84
0452	Utilities Maintenance	1943	85
0459	Information Technology Division	1945	84
0460	Director's Office	1945	84
0464	DOE-BHSO Group Office	1945	85
0475	Intellectual Prop/Energy Science & Tech	1946	84
0477	Research Library	1945	74
0528	Electrical Operations & ECS Document Storage	1943	76
	Warehouse/Storage		
0087	Excess Property Warehouse	1940	85
0096	Truck/Utility Storage	1941	85
0100	Bulk Warehouse	1940	85
0210	Gases Warehouse	1945	85
0321	Equipment Storage	1943	102
0339	Maintenance Storage	1940	102
0346	Storage	1946	94
0412	Site Storage	1943	102
0455	Electrical Storage-Bulb House	1917	85
0482	Hazardous Storage	1917	96
0496A	Storage	1946	95
0650A	Storage	1941	76
0581	Equipment Storage	1942	38
	Housing		
0153	Cavendish - Men's Residence	1941	94
0170	Compton - Men's Residence	1941	93
0180	Fleming - Men's Residence	1941	84
0257	Guest House	1943	83

0258	Curie-Women's Residence	1942	83
0302	Apartment 28	1946	109
0303	Apartment 34	1941	109
0304	Apartment storage	1941	109
0306	Apartment 13	1941	109
0307	Apartment 11	1941	109
0325	Apartment 7	1943	110
0327	Apartment 24	1943	109
0328	Apartment 26	1943	109
0330	Apartment 8	1943	110
0331	Apartment 10	1943	110
0334	Apartment 30	1943	109
0335	Apartment 36	1943	109
0349	Apartment 2	1943	110
0350	Apartment 4	1943	110
0351	Apartment 6	1943	110
0359	Apartment 5	1943	110
0360	Apartment 3	1943	110
0361	Apartment 1	1943	110
0362	Apartment 22	1943	110
0363	Coin Laundry	1943	109
	Recreational		
0317	Recreation Hall	1941	110
0461	Gymnasium	1945	84
0478	Swimming Pool	1946	84
	Industrial		
0244	Carpenter / Lock & Paint Shop	1946	83
0422	Building Maintenance Shop	1943	83
0423	Equip/Vehicle Repair	1943	102
0462	Central Shop - Sheet Metal Shop	1945	84
0473	Electron Beam Weld	1942	84
0479	Heavy Machine Shop	1946	95
0481	Sewage Pump House	1946	86
0573	Hypochlorite Storage Building	1942	74
0580	U.V. Disinfection Discharge	1942	39
	Scientific		
0348	Calibration	1943	73
0356	Solid State Irradiation Facility	1943	75
0421	Structural Biology	1943	84
0463	Biology	1945	84

0480	Material Sciences	1946	75
0526	Energy Efficiency & Conservation	1943	76

- 2007 – Archeological Field Survey of NSLS-II construction site. No significant archeological features identified and no further action required.

- 2009 – Section 106 reviews were performed for two areas affected by the proposed BP Solar Array Project, the WWI Camp Upton Remount Depot Site, and the privy site. These reviews were documented in the following reports, which were forwarded to SHPO in 2010: A *Stage 1 Archeological Survey for the Proposed Solar Array,* and the *Archaeological and Architectural Data Recovery for the Privy Site at BNL*. Once SHPO comments were addressed, SHPO concluded that the project would have no adverse effect upon cultural resources in or eligible for inclusion in the National Registers of Historic Places.

- 2016 – Archeological Field Survey of proposed Discovery Park area. No significant archeological resources were identified, and no further archeology is required.

- 2016 – Architectural survey of buildings 364, 365, 366, and 367, and WW I era cement roads conducted. Buildings were determined eligible for listing on NRHP. WW I cement roads were determined not to be NRHP eligible.

- 2018 – Section 106 Recordation of buildings 364 – 367 due to plan for future demolition. Recordation included in MOA between DOE-BHSO and NYSHPO.

- 2019 – Historic evaluation and survey of Scientific Buildings and structures greater than 50-years of age. Buildings STO-0049, 120, 488, 490, 491, 510, 515, 820, 820A, 820B, 830, 901, 901A, 902, 911, 912, 913, 913A-E, and 930 determined to be NRHP eligible.

- 2020 – Section 106 Recordation of 1940 Water Tower STO-0049.

- 2021 – Survey and evaluation of remaining buildings, infrastructure, and land features over 50-years of age.

- 2022 – Section 106 Recordation of Brookhaven Medical Reactor Stack prior to demolition as part of MOA between DOE-BHSO and NYSHPO.

N

W E

S

Legend

COLOR

Eligible for Listing

Ineligible for Listing

0 1,000 2,000

Feet

[redacted]

Environmental Protection Division

Attachment 11
Buildings & Structures Reviewed Under NHPA Section 106

JLH - 3/31/22
r:/arcmap_projects/natural_resources/archelogic_eligible_r4.mxd

NOTE: Sensitive Information

Not Shown – For General Distribution

Attachment 12

Archeological Survey Areas

The Archeological Survey Areas diagram is intentionally not shown.

Contact the BNL Cultural Resources Manager for additional information.

Cultural Resource Outreach Activities Attachment 13

Date	Event Description	Internal/External	External Organization(s)
9/1/2001	CU Display at Longwood Country Fair	External	Sponsor - Brookhaven Town
10/1/2001	Camp Upton Presentation	External	Manorville Historical Society
5/1/2002	Display at Wading River Duck Pond Day	External	GeneralPublic
7/1/2002	Camp Upton Presentation	External	Rocky Point Historical Society
9/1/2002	CU Display at Longwood Country Fair	External	Sponsor - Brookhaven Town
10/1/2002	CU Display	External	"Golden Gathering" at Suffolk Cnty Comm College
10/1/2002	Camp Upton Presentation	External	Yaphank Historical Society
11/1/2002	Camp Upton Presentation	External	Sayville Historical Society
3/1/2003	Camp Upton Presentation	External	Greater Patchogue Historical Society
5/25/2003	CU Presentation to Onsite tour Group	External	Great Neck Adult Education group
7/1/2003	Summer Sundays Exhibit	Both	General Public
7/1/2003	Camp Upton Presentation	External	E. Islip Historical Society
9/6/2003	Longwood Country Fair	External	Sponsor - Brookhaven Town; General public
7/1/2004	Summer Sundays Exhibit	Both	General Public - displayed July & August
9/6/2004	Longwood Country Fair	External	Sponsor - Brookhaven Town; General public
7/1/2005	Summer Sundays Exhibit	Both	General Public - displayed July & Aug
8/12/2005	Trench Tour	External	US Army Recruiting Office - Patchogue
8/14/2005	Summer Sunday - BNL History	Both	General Public - History bus tour; exhibits, etc
9/11/2005	Longwood Country Fair	External	Sponsor - Brookhaven Town; General public
10/27/2005	Cultural Resource Presentation	External	DOE SER/Envir. Monit. Conf - Los Alamos Natnl Lab
11/1/2005	Annual DAR Chapter Veterans Benefit Luncheon	External	Daughters of American Revolution local chapter
11/4/2005	History overview & Trench Tour	External	Brkhvn Twn 350th Anniv Committee
11/30/2005	Periodic (3) presentations at BNL	External	Greenmen Association (Over 55 community)

Date	Event Description	Internal/External	External Organization(s)
3/28/2006	Trench Tour	External	Wildlife Genetics Conference (7 people)
4/1/2006	Article in DOE CR Newsletter Partners In Preservation	External	DOE & contractor CR subscribers
5/4/2006	History & CRM overview	External	Stony Brook "Roundtable"
5/18/2006	Trench Tour	Both	Longwood Library/EWMS/DNE personnel (~6)
9/10/2006	Longwood Country Fair; 2-days	External	Sponsor - Brookhaven Town; General public
10/10/2006	Camp Upton presentation by JMP	External	DOE Librarians org
1/25/2007	Camp Upton Presentation by JMP	External	To East End Garden Club - SouthHampton DAR
5/31/2007	Presentation Site History	Both	Americal Nuclear Society - Long Island Chapter
7/31/2007	Site History Tour - DOE-BHSO Manger	Internal	Driving tour provided to DOE-BHSO Managers
9/9/2007	Longwood Country Fair; 2-days	External	Sponsor - Brookhaven Town; General
9/25/2007	BNL Site History Presentation	Internal	Presentation to DOE-BHSO
7/17/2008	Trench Tour	External	77th Division Regional Readiness Command officers
9/7/2008	77th Division Casing of Colors	External	BNL hosted ceremony for retiring 77th Division
9/20/2012	Presentation BNL site history	External	Bayshore Historical Society
5/23 – 12/29/2014		External	LI Museum Display – “Long Island at War: Front and Home Front”
5/2015, 7/26/2015		Internal/ External	“History of the BNL Site” – Middle Island Civic Summer Sundays
7/2016		Internal/ External	“History of Camp Upton” – Summer Sundays Tour of Camp Upton Collection – Suffolk Historical Society
6/2017, 7/2017, 8/2017, 9/2017		Internal/ External	“History of the BNL Site” – Employees, Summer Sundays, Local Historical Societies
4/2018, 6/2018		Internal	“History of BNL Site” – Visiting Scientists
Fall 2018		External	Suffolk County Historical Society – Camp Upton Exhibit w/artifacts borrowed from BNL
5/20/2021		External	Attended Yaphank Historical Society – Presentation on Meeks Houses Archeological Work conducted on BNL Property
6/17/2021		External	“National Register Eligible Buildings at BNL” – Yaphank Historical Society
10/4/2021		External	“History of Camp Upton” – German Genealogical Society, Hicksville, NY

Date	*Event Description*	*Internal/External*	*External Organization(s)*
3/9/2022		External	'History of Camp Upton" – Connetquot Library
4/2022 – 10/2022		External	"Atoms to Cosmos: The Story of Brookhaven National Laboratory" – Exhibit at Long Island Museum, Stony Brook, NY
7/25/2022		External	Camp Upton Tour for Michel Jacquis in preparation of book
2/2/2023		External	"History of Brookhaven National Laboratory" – Smithtown Library - Commack

Attachment 14
Cultural Resource
Management Strategy Form

Building/Site Name: _____

BNL Bldg. #: _____ **Grid #:** _____ **Site #:** _____

Date of construction or period of use: _____

Historic Significance Category: ☐ **I or** ☐ **II or** ☐ **N/A**

Historic Role(s): _____

- _____
- _____

Current Significant Feature(s): (Examples: exterior architecture; extant location; associated w/important personage; scientific achievement [e.g.; Nobel Prize]; unique facility; etc.)

-- _____
-- _____
-- _____
-- _____
-- _____

Plans for Bldg or Site:

- _____
- _____
- _____

Treatment and/or Mitigation Plans:

- _____
- _____
- _____

Level A *(achieved, in-progress, or relatively achievable)*

- _____
- _____
- _____
- _____
- _____
- _____
- _____

Level B *(resource permitting)*

- _____
- _____
- _____
- _____

Attachment 15

Cultural Resource Management Strategy Groups

Historic & Unique Sites:

World War I Features* (Trenches & Foundations)
Circa 1850s home sites* (2)
Gamma Forest site*

Scientific Achievement & Engineering Design:

BGRR Complex* (Bldgs. 701, 703, 801)
HFBR Complex* (Bldgs. 750, 751)
AGS Complex*
Medical Research Center/Program* (Bldgs. 490, 491)
Cosmotron (Bldg. 902)*
Chemistry* Bldgs. 820, 820A, 820B*
Bldg. 830* Bldgs. 510*, 515*
Bldg. 535*

Architecturally Significant:

Chemistry Building, 555*: Designed by Marcel Breuer
Berkner Hall, 488*: Designed by Max O. Urbahn
1960s Apartments (364, 365)*: Mid-Century Modern

Period Representation:

Building 30: "The Center", CCC (1930's) era structure
Building 120*: WWII barracks style building w/ minimal renovations

*Determined "Eligible for Listing on the NRHP"

Attachment 16

Archaeological Site Numbers

The New York State Historic Preservation Officer assigned the following site numbers:

A10302.002771 Camp Upton World War I Features (trenches and foundations) as documented in "DOE Evaluation of World War I Trenches and Other Features", letter Mackey to Holland, November 17, 2003.

A103.02.0474.0015 Camp Upton World War I training trenches (SB20-SB33) identified during the ISABELLE project survey (Johannemann and Shroeder 1977).

A103.02.002283 Camp Upton, BNL features 01/01A (depression with brick pile), Feature 02 (latrine/shower facility), Feature 03 (WW I dump). Identified during the Eastern Long Island Extension Pipeline survey (Maymon et al. 2003).

A10302.002923 WWI Camp Upton Remount Depot Site. A stage 1 archeological survey of this site was performed in 2009 as part of the proposed BP Solar Array Project.

A10302.002924 Privy site. An archaeological and architectural data recovery survey was performed in 2009 as part of the proposed BP Solar Array Project.

A10302.002283 Camp Upton Hospital Complex. Phase I Archeological Survey of the Discovery Park proposed development performed in 2016. (Louis Berger Group 2016)

NEW YORK STATE PREHISTORIC ARCHAEOLOGICAL SITE INVENTORY FORM

For Office Use Only--Site Identifier _____
Project Identifier _____ Date _____
Your Name _____ Phone _____
Address _____
_____
Zip _____
Organization (if any) _____

1. Site Identifier(s)_____
2. County _____ One of following: _____
   Township_____
   Incorporated Village _____
   Unincorporated Village or Hamlet_____
3. Present Owner_____
   Address _____
   Zip _____

4. Site Description (check all appropriate categories): Structure/site
   Site

___Stray find	__ Cave/Rockshelter	__ Workshop
__ Pictograph	__ Quarry	__ Mound
__ Burial	__ Shell midden	__ Village
___Surface evidence	__ Camp	__ Material in plow zone
___ Material below plow zone	__ Buried evidence	__ Intact occupation floor
___ Single component	__ Evidence of features	__ Stratified
___ Multicomponent		

   Location

__ Under cultivation	___ Never cultivated	__ Previously cultivated
__ Pastureland	____Woodland	__ Floodplain
___Upland	___ Sustaining erosion	___Residential lawn

   Soil Drainage: excellent__ good___ fair___ poor___
   Slope: flat____gentle __moderate ___steep __
   Distance to nearest water from site (approx.)_____Elevation: _____

5. Site Investigation (append additional sheets, if necessary):
   Surface--date(s)_____
   Site Map (Submit with form)_____
   Collection _____
   Subsurface--date(s)_____
   Testing: shovel____ coring___ other ___ unit size_____ no. of units_____
   Excavation: unit size_____ no. of units _____
   Investigator_____

   Manuscript or published report(s)(reference fully):

   Present repository of materials _____

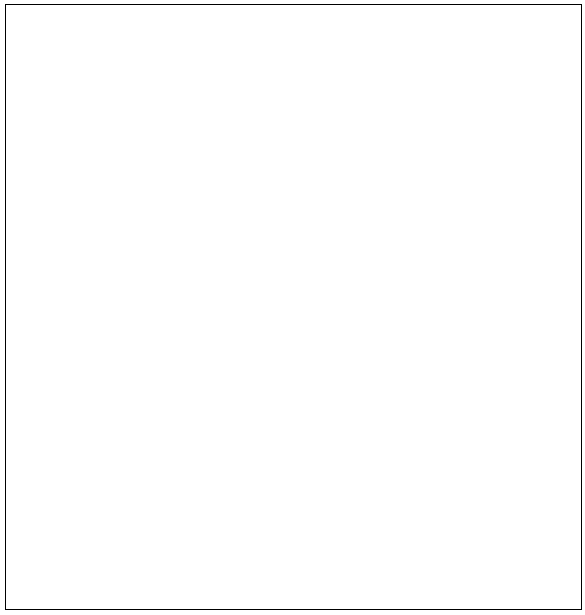
6. Component (s)(cultural affiliation/dates):

7. List of material remains (be as specific as possible in identifying object and material):

If historic materials are evident, check here and fill out historic site form.

8. Map References: Map or maps showing exact location and extent of site must accompany this form and must be identified by source and date. Keep this submission to 8.5x11" if possible.
USGS 7.5' Minute Series Quad. Name
For Office Use Only--UTM Coordinates

9. Photography (optional for environmental impact survey):
Please submit a 5x7" black and white print(s) showi ng the current state of the site. Provide a label for the print(s) on a separate sheet. (see report)



Attachment 18

NEW YORK STATE HISTORIC ARCHAEOLOGICAL SITE INVENTORY FORM

For Office Use Only--Site Identifier_____
Project Identifier_____ Date _____
Your Name _____ Phone _____
Address _____
_____
Zip _____

Organization (if any)_____

1. Site ldentifier(s)_____
2. County _____ One of following: City-_____
Township_____
Incorporated Village_____
Unincorporated Village or Hamlet_____
3. Present Owner_____
Address _____
_____
Zip _____

4. Site Description (check all appropriate categories): Structure/site
Superstructure: complete____ p a r t i a l_____ collapsed_____ not evident_____
Foundation: a b o v e____ below____ (ground level) not evident____
Structural subdivisions apparent: Only surface traces visible____ Buried traces detected____

List construction materials (be as specific as possible):

Grounds: Under cultivation____ Sustaining erosion____ Woodland____Upland____
Never cultivated____Previously cultivated____ Floodplain____ Pastureland____
Soil Drainage: excellent____ good____ fair____poor____
Slope: flat____ gentle____ moderate____steep____
Distance to nearest water from structure (approx.)_____ Elevation:_____

5. Site Investigation (append additional sheets, if necessary):
Surface—date(s)_____
Site Map (Submit with form)_____
Collection_____

Subsurface-date(s)_____
Testing: shovel____ coring____othe r____ unit size_____ no. of units_____
Excavation: unit size_____ no. of units_____
Investigator _____

Manuscript or published report(s)(reference fully):

Present repository of materials _____

6. Site inventory:
   a. date constructed or occupation period _____
   b. previous owners, if known _____
   c. modifications, if known: _____

7. Site documentation (append additional sheets, if necessary):
   a. Historic maps _____
   1) Name_____ Date_____ Source _____
   Present location of original, if known _____
   2) Name _____Date _____ Source _____
   Present location of original, if known _____
   3) Name _____ Date _____ Source _____
   Present location of original, if known _____
   b. Representation in existing photography
   1) Photo date _____ Where located _____
   c. Primary and secondary source documentation (reference fully):
   d. Persons with memory of site:

8. List of material remains other than those used in construction (be as specific as possible in identifying object and material):

   If prehistoric materials are evident, check here and fill out prehistoric site form. _____

9. Map References: Map or maps showing exact location and extent of site must accompany this form and must be identified by source and date.
   USGS 7.5' Minute Series Quad. Name _____
   For Office Use Only-UTM Coordinates _____

10. Photography (optional for environmental impact survey): see report

11. Eligibility Discussion
   A.____Property appears NR/SR eligible.
   Identify relevant theme: _____
   Existence of relevant context: ___yes ___ n o
   Discuss: _____

   B. Specific Criteria for Eligibility:
   Criteria A.____ Associated with events that have made a significant contribution to the broad patterns of our history.
   Criteria B.____ Associated with the lives of persons significant in our past.
   Criteria C.____ Embodies the distinct characteristics of a type, period, or method of construction; or represents a significant and distinguishable entity whose components may lack individual distinction; or
   Criteria D.____ Have yielded, or may be likely to yield, information important in prehistory or history.

C. Discussion (Provide a brief paragraph summarizing site)

BROOKHAVEN NATIONAL LABORATORY
TRENCH FEATURE INVENTORY FORM

Trench ID number: _____

Data collected by: _____ Date: _____

USGS 7.5' quadrangle: _____ BNL map grid: _____

Photo number: _____ View of:_____

Description: _____
_____
_____
_____
_____
_____

Trench type: _____ Adjacent trench number(s): _____
Associated cultural material:_____

Average dimensions (see attached):
length: _____ width: _____depth: _____

Coordinates (UTM Zone 18N)

Point	**Easting**	**Northing**

Attachment 20

BROOKHAVEN NATIONAL LABORATORY
FOUNDATION FEATURE INVENTORY FORM

Foundation Area: _____

Data collected by: _____ Date: _____

USGS 7.5' quadrangle: _____ BNL map grid: _____

Photo number: _____ View of:_____

Description: _____
_____
_____
_____
_____
_____

Types of features:
_____
_____

Complex dimensions (see attached):
East-West length: _____ North-South length: _____

Coordinates (UTM Zone 18N)

Point	**Easting**	**Northing**

Attachment 21

Brookhaven National Laboratory
Cultural Resource Property Accession Receiving Report

_____ - ____ - _____ _____
Accession date (year-month-day) Number of items in collection

Use this form to document the receipt of artifacts an :or& and to collect pertinent information on the item(s). If additional space is needed, attach a separate sheet. Use ink or type.

1. Name of Item(s): _____

2. Name and address of Source of Accession:

_____

_____

_____

Phone: _____ E-mail: _____

3. Give brief description, identification and history of the collection. Note locality collected or purchased, give site names and numbers if appropriate. Use page 2 to list individual items in collection. ***This information* is *provided by the Source of Accession only*.**

4. Remarks:

5. Objects and/or Specimens Received by: _____
Print Name and Title of BNL Employee

_____ Date:_____ at:_____
Signature Unit Location

Attachment 21

ACCESSION RECEIVING REPORT
LIST OF OBJECTS AND/OR RECORDS

______________________ ______________

BNL Office Accession Date

Use this form to provide a list of the objects and/or specimens and their condition. This form is used only as an attachment to the Accession Receiving Report.

Quantity	Object or Specimen Name	Description	Condition

Camp Upton Historic Collection

Accession Records Work Sheet

Accession Number:

Title:
First Name:
Last Name:
Street:
Street:
City:
State:
Zip Code:
Day Phone:
Evening Phone:

Donation Date:
Acquistion Type:
Donation For:

Quantity:	**ltem:**	**Description:**

Comments and More Items (if **necessary):** _____

_____

_____

_____

_____

Signature of Donor: _____

_____

Reply ☐

Attachment 23

Camp Upton Historic Collections
Cataloging Worksheet Catalog No. CU-
Class 2

Accession No: BNL Negative No. Count: Parts:

Object Name:

Object Location: Object Status:

Description:

Photo Info. Horizontal BW Studio Indoors Glossy
Circle: Vertical Color Candid Outdoors Matte Panoramic

Object Date:
Artist/Author:
Maker/Publisher:
Maker Address: Country: State: City

Cultural Identity: Exhibit Potential:
Association: WW
Eminent Figures:

Significance: International National Regional Local

Dimensions H x W x Circ./Length

Materials

Condition Complete/Incomplete Condition: Excellent/Good/Fair/Poor
Condition Description

Maintenance Cycle: Maintenance Start Date:
Cataloger Name: Date Catalogued:
Catalog Folder: Items: Orig. Value $
Photo Taken: Restrictions: Current Value $
Identified By: Identified Date:
Memo:

Attachment 24

Shovel Test Pit Record

Project_____ Date _____Crew_____

Unit

Level	Open	Close	Horizon	Color/texture	Cultural material	comments

Unit

Level	Open	Close	Horizon	Color/texture	Cultural material	comments

Unit

Level	Open	Close	Horizon	Color/texture	Cultural material	comments

Attachment 25

Excavation Record Form

Project _____ Unit (SW corner)
Site/Area _____ Unit size
Excavators_____ SW/SE/NW/NE quad of
Date _____ Vertical datum

ground surface or opening depths: SW____ SE ____ NW ____ NE____
closing depth: SW____ SE ____ NW ____ NE____
level # : ____(open) ____ (close)
stratum: _____ soil: _____
lot # _____ # bags of artifacts: _____
cultural material: _____
comments:_____
check all that apply: feature___ color print photo____ color slide____ b&w photo____
plan view____ profile drawing____ soil sample____ C^{14} sample____ other____

closing depth: SW____ SE ____ NW ___ NE____
level # :____ (open)____ (close)
stratum: _____ soil: _____
lot # _____ # bags of artifacts: _____
cultural material:_____
comments:_____
check all that apply: feature____ color print photo____ color slide____ b&w photo____
plan view ____ profile drawing____ soil sample____ C^{14}sample____ other____

Attachment 26

Feature Record Form

Project _____ Feature **#**_____
Site/Area_____ Unit (SW corner)_____
Excavators_____ Unit size_____
Date_____ Vertical datum_____

lot **#**_____ top depth below datum or ground surface:_____

description:_____
stratigraphic context:_____
feature matrix description:_____
dimensions: length_____ width_____ depth_____
associated cultural material/# bags:_____

excavation methods (sectioning, screening, etc.):_____
_____

photographs/drawings/samples (check all taken): color print photo____ b&w photo____
color slide____ plan view drawing____ profile drawing____ soil sample____
C^{14} sample____ other____

Subject Area: National Environmental Policy Act (NEPA) and Cultural Resources Evaluations

Management System: Environmental Management System

Effective Date: September 21, 2020 (Rev 1.10)
Last Reviewed: September 21, 2020
Next Periodic Review: September 21, 2025

MS Steward: Michael Clancy Jr
MS Executive: Jason Remien
Subject Matter Expert: Timothy Green

Introduction

Staff involved in projects, activities, or facility modifications that involve either federal funding, or use of federal facilities, federal lands, or capital equipment must ensure that a NEPA/Cultural Resources review is performed before initiating work.

Contents

Section	Overview of Content (see section for full process)
1. Conducting National Environmental Policy Act (NEPA) and Cultural Resources Evaluations	• Determine if reviews are required based on given criteria. • Send specified information to the NEPA SME. • NEPA SME either issues a memorandum that the NEPA process has been completed (via an existing approval) or provides PI with an EENF to be filled out. • Complete EENF to best of knowledge and forward to NEPA SME for completion. • NEPA SME returns signed EENF to PI/PM for review and signing.

	• PI/PM returns EENF to NEPA SME for submission to DOE-BHSO for NEPA determination. • Follow appropriate process based on DOE-BHSO response.

References

DOE Order 451.1B, National Environmental Policy Act Compliance Program

Standards of Performance

All staff shall comply with applicable Laboratory policies, standards, and procedures, unless a formal variance is obtained.

Managers shall analyze work for hazards, authorize work to proceed, and ensure that work is performed within established controls.

Managers shall ensure that work is planned to prevent pollution, minimize waste, and conserve resources, and that work is conducted in a cost-effective manner that eliminates or minimizes environmental impact.

BNL shall actively seek and consider the public's input on the Laboratory's decisions that affect the community and the general public.

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1. Conducting National Environmental Policy Act (NEPA) and Cultural Resources Evaluations

Applicability

This information applies to Project Managers/Principal Investigators responsible for projects, activities, or facility modifications that involve either federal funding or use of federal facilities, federal lands, environmental permits (i.e., wetlands permits), or capital equipment.

Required Procedure

Staff involved in projects, activities, or facility modifications that involve either federal funding, or use of federal facilities, federal lands, or capital equipment must ensure that a NEPA/Cultural Resources review is performed before initiating work.

Note: Any work performed by Brookhaven Science Associates for other national laboratories must comply with DOE NEPA requirements, even if the work does not involve the Brookhaven National Laboratory site or other federal resources. The Laboratory that is requesting funds from DOE is responsible for completion of the NEPA process.

Note: If the proposed activity does not involve federal funding, but uses DOE-owned or leased property, capital equipment, federal lands, or requires new or modified permits (i.e., SPDES, wetlands, air) the activity must be reviewed by the Environmental Subject Matter Expert for NEPA or Environmental Compliance Representative to determine the level of NEPA documentation required.

Note: If the project concerns structural modification of the following buildings, then a NEPA and/or Cultural Resource Evaluation must be conducted by the Environmental Subject Matter Expert for NEPA and/or Cultural Resources: Buildings 120, 364, 365, 488, 490, 491, 510, 515, 535, 555, 701, 703, 750, 751, 801, 820, 820B, 830, 901, 901A, 902, 911, 912, 913, 913A-E, 930, and ST0049.

Note: If the proposed activity does ***not*** involve federal funding or the use of federal facilities, lands, or capital equipment, NEPA does ***not*** apply.

Note: Certain activities may be allowed prior to NEPA approval. Contact the Environmental Subject Matter Expert for NEPA for additional information.

The following actions must be taken to initiate a NEPA/Cultural Resources review.

Step 1	Project Managers/Principal Investigators involved in projects, activities, or facility modifications that involve either federal funding or use of a federal facility, federal lands, or capital equipment determine if NEPA and Cultural Resources reviews are required. NEPA/Cultural Resources reviews are required for the following types of projects: • a project that involves a research paper investigation • a project that involves experimental work • a project where the scope, location, or probable environmental impact has changed since an earlier NEPA review • a project that involves facility or structural construction, installation, or modifications • a project that involves outdoor field work such as excavation, environmental monitoring, characterization, or research • an activity that involves new or modified permits (i.e., SPDES, wetlands, air) • an activity that involves a capital procurement for fabrication services over $500,000. Questions regarding the applicability of NEPA/Cultural Resources Review should be directed to the Environmental Subject Matter Expert for NEPA.
Step 2	Provide the Environmental Subject Matter Expert for NEPA with a project title, project description, total estimated project cost, and source of funding.
Step 3	If the action is an authorized Categorically Excluded activity, or is included in a Finding of No Significant Impact or a Record of Decision (ROD) previously issued to the Laboratory, the Environmental Subject Matter Expert for NEPA issues a memorandum that the NEPA process has been completed. Maintain this record and proceed with work if funding is available.
Step 4	If the action requires a decision by a DOE NEPA Compliance Officer, the Environmental Subject Matter Expert for NEPA will direct you to submit a NEPA Environmental Evaluation Notification Form. Complete sections I through III to the best of your knowledge. In section IV, provide an explanation for each item marked "yes" in Section III. Forward the form to the Environmental Subject Matter Expert for NEPA, who will review, complete as necessary, sign, and return the form. Review the form for accuracy, sign it, and

	return it to the Environmental Subject Matter Expert for NEPA who will forward it to the Department of Energy Brookhaven Site Office (DOE-BHSO) under the subject "Request for NEPA Evaluation."
Step 5	If DOE's response to the "Request for NEPA Evaluation" is a written determination that the action is consistent with DOE-established Categorically Excluded actions, the NEPA process is complete. If the project has the potential to impact a known or possibly unknown cultural resource, additional instructions on compliance will be provided by the Environmental Subject Matter Expert for NEPA. Maintain this record and proceed with work if funding is available.
Step 6	If DOE's response to the "Request for NEPA Evaluation" is a request to prepare an Environmental Assessment, work with the Environmental Subject Matter Expert for NEPA to complete one. A cultural resource review will be included as part of this document. Review the document with the Environmental Subject Matter Expert for NEPA, and then submit the Environmental Assessment to the DOE Office. Should DOE issue a Finding of No Significant Impact, the NEPA process is complete. Maintain this record and proceed with work if funding is available.
Step 7	If DOE's response to the "Request for NEPA Evaluation" or completed Environmental Assessment is that an Environmental Impact Statement (EIS) is required, the DOE and its contracted designee works with the Project Manager/Principal Investigator to gather information on the proposed action, possible alternatives, and anticipated impacts. A cultural resources review will be included as part of the EIS. Should DOE issue a ROD, the NEPA process is complete. Maintain this record and proceed with work if funding is available. Should the ROD incorporate a Mitigation Action Plan, requirements must be incorporated into the planned work.

Guidelines

If the proposed activity is funded by a federal agency **other than DOE** and does not involve the use of DOE-owned or leased facilities, capital equipment, or federal lands, the Project Manager/Principal Investigator should notify the client that compliance with the requirements of NEPA is the responsibility of that agency.

General procurement (including capital equipment) is considered categorically excluded (no additional NEPA Review required), as long as the use remains unchanged and/or the type of environmental impacts remains essentially the same, when compared to existing equipment. The maturity of the BNL EMS Program and the ECR Program has resulted in Work Planning & Control, Experimental Safety Review, and Tier 1 programs that effectively identify potential environmental aspects and potential impacts. These programs are sufficient to adequately identify potential impacts from the use of capital expenditures.

Subject Area: National Environmental Policy Act (NEPA) and Cultural Resources Evaluations

Management System: Environmental Management System

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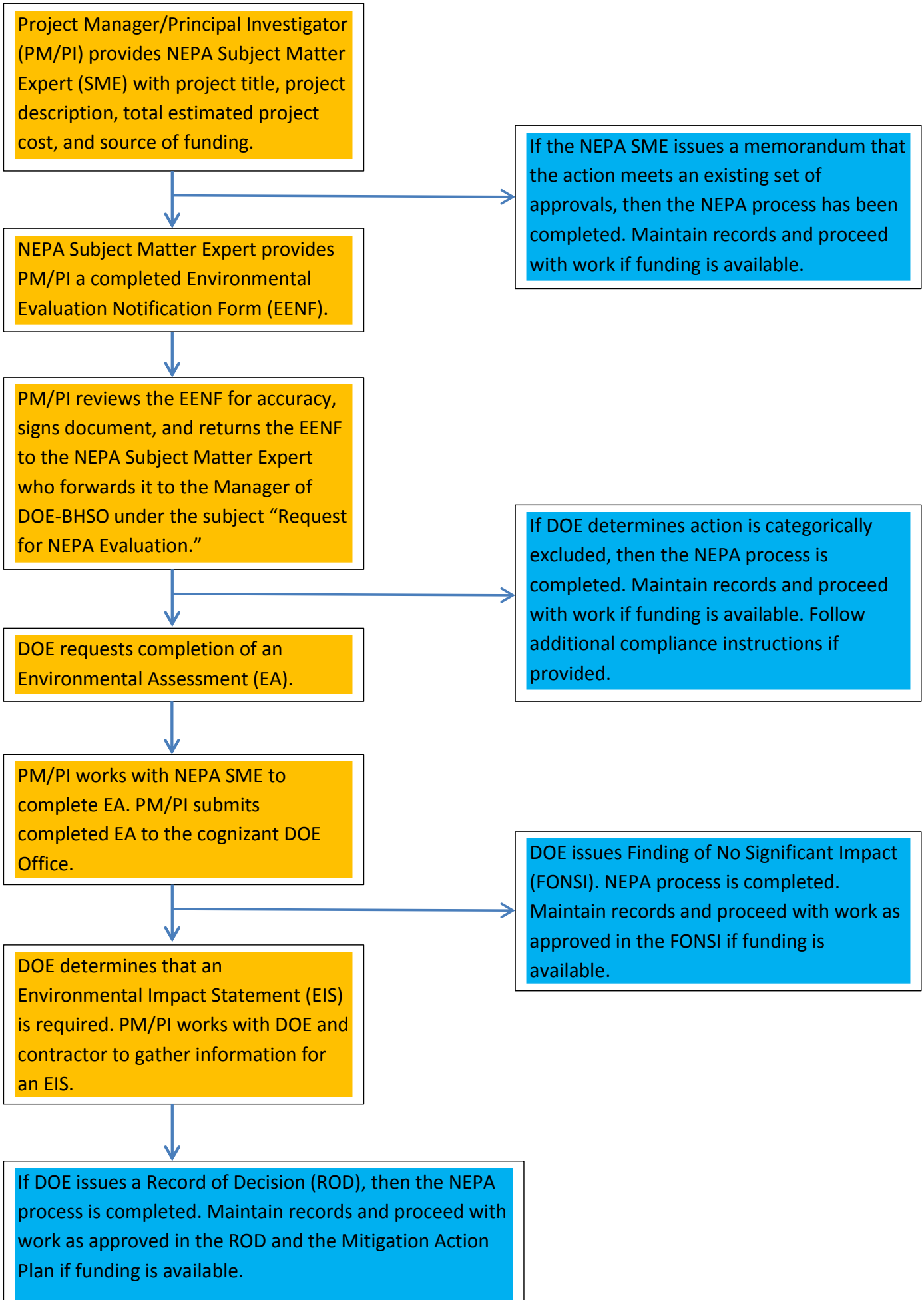
MS Steward: Michael Clancy Jr
MS Executive: Jason Remien
Subject Matter Expert: Timothy Green

Exhibit:
Flow Diagram of the NEPA Process

Effective Date: September 21, 2020

The Flow Diagram of the NEPA Process is provided as a PDF.

FLOW DIAGRAM OF THE NEPA PROCESS



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Form:
NEPA Environmental Evaluation Notification Form

Effective Date: September 21, 2020

The NEPA Environmental Evaluation Notification Form is available as a Word document.

Brookhaven National laboratory

National Environmental Policy Act(NEPA)

ENVIRONMENTAL EVALUATION NOTIFICATION FORM

Project/Activity Title: _____

BNL Project Tracking No.: _____ DOE NEPA No.: _____

BNL Project Manager: _____ Signature: _____
Date: _____

BNL NEPA Reviewer: J. Higbie _____ Signature: _____
Date: _____

I. Description of Proposed Action:

II. Description of Affected Environment:

III. Potential Environmental Effects: (In Section IV, document an explanation for each "yes" and "no" response if additional information is available and could be significant in the decision-making process.)

A. Sensitive Resources: Will the proposed action result in changes and/or disturbances to any of the following resources?

		Yes/No
1.	Threatened/Endangered Species and/or Critical Habitats	☐ ☐
2.	Other Protected Species (e.g., Burros, Migratory Birds)	☐ ☐
3.	Wetlands	☐ ☐
4.	Archaeological/Historic Resources	☐ ☐
5.	Prime, Unique, or Important Farmland	☐ ☐
6.	Non-Attainment Areas	☐ ☐
7.	Class I Air Quality Control Region	☐ ☐
8.	Climate Change (e.g., greenhouse gases)	☐ ☐
9.	Special Sources of Groundwater (e.g., Sole Source Aquifer)	☐ ☐
10.	Navigable Air Space	☐ ☐
11.	Coastal Zones	☐ ☐

12.	Areas with Special National Designation (e.g., National Forests, Parks, Trails)	☐	☐
13.	Floodplain	☐	☐

B. Regulated Substances/Activities: Will the proposed action involve any of the following regulated substances or activities?

		Yes	No
14.	Clearing or Excavation	☐	☐
15.	Dredge or Fill (under Clean Water Act section 404; indicate if greater than 10 acres)	☐	☐
16.	Noise (in excess of regulations)	☐	☐
17.	Asbestos Removal	☐	☐
18.	PCBs	☐	☐
19.	Import, Manufacture, or Processing of Toxic Substances	☐	☐
20.	Chemical Storage/Use	☐	☐
21.	Pesticide Use	☐	☐
22.	Hazardous, Toxic, or Criteria Pollutant Air Emissions	☐	☐
23.	Liquid Effluent	☐	☐
24.	Underground Injection	☐	☐
25.	Hazardous Waste	☐	☐
26.	Underground Storage Tanks	☐	☐
27.	Radioactive (AEA) Mixed Waste	☐	☐
28.	Radioactive Waste	☐	☐
29.	Radiation Exposures	☐	☐
30.	Surface Water Protection	☐	☐
31.	Ozone Depleting Substances	☐	☐

C. Other Relevant Disclosures. Will the proposed action involve the following?

		Yes	No
32.	A threatened violation of ES&H regulations/permit requirements	☐	☐
33.	Siting/Construction/Major Modification of Waste Recovery, or TSD Facilities	☐	☐
34.	Disturbance of Pre-existing Contamination	☐	☐
35.	New or Modified Federal/State Permits	☐	☐
36.	Public controversy (e.g., Environmental Justice Executive Order 12898 consideration and other related public issues)	☐	☐
37.	Action/involvement of Another Federal Agency (e.g., license, funding, approval)	☐	☐

38.	Action of a State Agency in a State with NEPA-type law.(Does the State Environmental Quality Review Act Apply?)	☐	☐
39.	Public Utilities/Services	☐	☐
40.	Depletion of a Non-Renewable Resource	☐	☐
41.	Adverse visual impacts	☐	☐
42.	Targets for Intentional Destructive Acts	☐	☐
43.	Opportunity for environmental sustainability (energy usage, green buildings, native vegetation, etc.)	☐	☐
44.	Connected Action (To other actions with significant effects)	☐	☐
45.	Extraordinary Circumstances (affecting significance of environmental effects)	☐	☐

IV. Additional Information:

NOTE: DOE BHSO will utilize the information provided in this EENF to make a NEPA determination. The separate determination document, provided by DOE, is to be appended to this NEPA review.

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Requirements

Reporting Obligations

This subject area contains reporting obligations. See the section 1. Conducting National Environmental Policy Act (NEPA) and Cultural Resources Evaluations.

External/Internal Requirements

BNL has to abide by all applicable Prime Contract clauses, DOE directives, industry standards, as well as Federal, state, and local laws. BNL develops its policies and procedures based on an evaluation of these external requirements. This Subject Area implements the following requirements:

Internal & External Requirements

There are no internal or external requirements for which this document has responsibility

Subject Area: National Environmental Policy Act (NEPA) and Cultural Resources Evaluations

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Training

This subject area does not contain training requirements.

Subject Area: National Environmental Policy Act (NEPA) and Cultural Resources Evaluations

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Terms & Definitions

Term	Definition
categorical exclusion (CX)	Through previous experience and documentation, DOE has identified actions that have no significant environmental impact and do not require the preparation of an Environmental Assessment or Environmental Impact Statement. These actions are Categorically Excluded from NEPA.
cultural resources	Historic or prehistoric sites, artifacts, or other items of cultural importance; standing structures that are over 50 years of age, or represent a major historical theme or era; recent structures, facilities, equipment, and apparatuses that have historical scientific significance. (Contact the Environmental Subject Matter Expert for Cultural Resources for questions on specific items or potential resources).
environmental assessment (EA)	A public document that provides sufficient evidence to support the preparation of an Environmental Impact Statement or a Finding of No Significant Impact. The EA includes brief discussions of the need for the proposal; alternatives to the proposal; environmental impacts associated with the proposal and alternatives considered; and a listing of agencies and persons consulted. DOE is responsible for this document.

Term	Definition
Environmental evaluation notification form (EENF)	This form includes a preliminary evaluation of the potential environmental impacts associated with a proposed action, in order to determine the appropriate level of NEPA documentation required. It is completed by the Environmental Subject Matter Expert for NEPA and the PI/PM and is reviewed and approved by the DOE NEPA Compliance Officer.
environmental impact statement (EIS)	A public document which provides sufficient evidence to support the preparation of a Record of Decision. The EIS includes brief discussions of the need for the proposal; alternatives to the proposal; environmental impacts associated with the proposal and alternatives considered; and a listing of agencies and persons consulted. Document review is conducted through a prescribed process of public participation and involvement. DOE is responsible for this document.
finding of no significant impact (FONSI)	A determination by DOE that the proposal will not produce any significant impact to the environment, based on a review of the proposed action and alternatives.
mitigation action plan (MAP)	A plan that establishes measures to be conducted in conjunction with a proposed action in order to minimize impacts to the environment. The measures established by a MAP are considered enforceable requirements for project completion, and must be tracked and reported based on an established schedule.
Record of Decision (ROD)	A decision rendered by the Secretary of Energy based on information provided in an EIS. It includes the selection of alternatives and potential mitigating measures that have been incorporated through a MAP.

ENVIRONMENT, SAFETY, AND HEALTH DIRECTORATE

BROOKHAVEN NATIONAL LABORATORY

REGULATORY COMPLIANCE PROCEDURE

Procedure No. **RC-SOP-501**

Revision No. 4

Project Reviews for Potential Impact to Cultural Resources

The only official copy of this file is the one on line. Before using a printed copy, **verify** that it is the **most current version** by checking the document effective date on the web site.

PREPARED BY:	**REVIEWED BY:**	**APPROVED BY:**
T. Green/ 9/4/18 Author /Date	T. Green/ 9/4/18 EPD Compliance Group Leader/Date S. Stein/ 9/12/18 Quality Representative/Date	J. Remien/ 9/14/18 EPD Division Manager/Date **EFFECTIVE DATE:** September 14, 2018 **REVIEW CYCLE: 5 years**
Filing Code: EC45ER.18		

(Signatures on file)

Revision Log

Section	Page #	Reason(s) for Revision	Rev. #	Date
All	All	Review cycle update; added Revision Log; miscellaneous editorial refinements.	2	11/3/06
2.0	3	Added responsibility for records management.	2	11/3/06
6.1.4	4	Included maintenance and project planning flags.	2	11/3/06
6.2.2	5	Added list of strategy forms.	2	11/3/06
All	All	Update Directorate name; replace EWMSD with EPD throughout; change CR coordinator to CR personnel throughout	3	1/17/13
10.0	7	Added section 10.0 Applicable FRAs/JRAs	3	1/17/13
2.0	4	Adjusted language in section 2.1	4	6/20/18
6.0	5	Updated discussion on digging permits section 6.1.2	4	6/20/18
6.0	6	Added a Note to Section 6.2.1, added 1960s Era Efficiency Apartments to list in Section 6.2.2	4	6/20/18
6.0	7	Added WW I cement roads in Section 6.3.1.2	4	6/20/18
11.0	8	Added section 11.0 EMS Information	4	6/20/18
Att. 1		Added 1960s Era Efficiency Apartments to table	4	6/20/18

1.0 PURPOSE AND SCOPE

The purpose of this procedure is to provide a standardized method for reviewing BNL projects in order to assess their potential to impact on site cultural/historic resources. The scope includes descriptions of how reviews are initiated, cultural resource aspects to be considered, and management tools used to assist in the evaluations.

2.0 RESPONSIBILITIES

2.1 The Cultural Resources program personnel are responsible for reviewing project information (proposals, descriptions, digging permits, etc.), usually through the National Environmental Policy Act (NEPA) review process, to determine the potential effects on BNL cultural resources, and ensuring mitigating actions are performed in accordance with the BNL Cultural Resource Management Plan (CRMP).

2.2 The Environmental Protection Division manager is responsible for reviewing, signing, and ensuring distribution of formal documents to DOE.

2.3 The Natural and Cultural Resources Manager is responsible for reviewing draft and final documents generated by the Cultural Resource program personnel.

2.4 Environmental Subject Matter Experts (SME), with designated authority to review project documents and sign digging permits, are responsible for considering the impact on cultural resources in their review.

2.5 All records generated as a result of this procedure are to be maintained in the appropriate file codes.

3.0 DEFINITIONS

3.1 Cultural Resources – Historic or prehistoric sites, artifacts, memorabilia, or other items of cultural importance; standing structures over 50 years of age, or that are important because they represent a major historical theme or era; recent structures, facilities, equipment, and apparatus that have scientific significance or that are determined to be supporting assets.
Note: This definition was paraphrased from the definition found in Reference 8.1.

4.0 PREREQUISITES

None

5.0 PRECAUTIONS

None

6.0 PROCEDURE

Section 6.1 identifies mechanisms that initiate a cultural resource review. Sections 6.2 through 6.4 identify the culturally significant resources and aspects that shall be considered during the review. Project reviews shall consider both direct and indirect impacts to these resources

6.1 Project Review Initiation: Cultural resource reviews are initiated through the following mechanisms:

6.1.1 National Environmental Policy Act (NEPA) Reviews: A NEPA review shall be conducted for the majority of projects performed on site, including construction, modification, renovation, scientific experiments, and studies, etc. (see Reference 8.2 for a description of the NEPA process). Cultural resources are one of the environmental aspects evaluated as part of a NEPA review. This procedure shall serve as a guide for identifying the various cultural resources to be considered during a project review.

6.1.2 Digging Permits: The Facilities and Operations (F&O) Digging Permit Program requires issuance of a digging permit for excavations greater than 6 inches in depth or with machinery in any area of the Lab. The Digging Permit form shall be reviewed and signed by an environmental Subject Matter Expert (SME). The SME shall consider potential impacts to cultural resources, along with endangered species and other environmental aspects digging permits are retained by F&O.

6.1.3 Building/Site Maintenance and Project Planning Tools: Mechanisms have been integrated into BNL maintenance and project planning programs to identify specific cultural resource aspects, including the MAXIMO maintenance scheduling system which flags specific buildings having historic or architectural aspects; FO- ES&H Evaluation-500A Form, which includes a Cultural Resource check box and contact phone number; Facility Use Agreements, which identify buildings having historic or architectural aspects; and the BNL Land Use Controls Map, which identifies sensitive cultural resource areas.

6.2 Buildings

6.2.1 Buildings over 50 years of age: Any major undertaking (major modification, demolition, relocation) associated with a building over 50 years of age may require that a National Historic Preservation Act (NHPA) Section 106 review be performed, unless otherwise addressed in the approved BNL Cultural Resource Management Plan. The Section 106 review shall be based on the requirements of 36 CFR Part 800.4.

Note: Most of the WW II era buildings have had Section 106 reviews completed on them and have been determined NOT ELIGIBLE for listing on the National Register of Historic Places.

6.2.2 Cultural Significance Categories: Cultural Significance Category Descriptions (see Attachment 1) describes the categories that establish discrete levels of historical significance and identify specific buildings within each level. If the action to be performed is associated with a Category I or II building, then refer to the Cultural Resource Management Strategy Form associated with that structure or associated group for details on the specific features considered historically significant. The Strategy Forms may also identify specific strategies developed for certain types of actions. Cultural Resource Management Strategy Forms have been developed for the following resources and are presented as Appendix C in the BNL Cultural Resource Management Plan:

- Alternating Gradient Synchrotron (AGS)
- Berkner Hall (Building 488)
- Brookhaven Graphite Research Reactor Complex
- Brookhaven Medical Research Reactor
- Building 30, Brookhaven Center
- Building 120, Former Barracks Building
- Chemistry Building (Building 555)
- Cosmotron
- Gamma Forest
- High Flux Beam Reactor Complex
- Hot Laboratory
- Medical Research Center (Program)
- Weeks Campbell Site (1800's Home Site)
- W.J. Weeks House Site (1800's Home Site)
- World War I Foundation Features
- World War I Training Trenches
- 1960s era Efficiency Apartments

6.3 Cultural Resource Areas and Sites

6.3.1 Areas considered culturally significant or sensitive include:

6.3.1.1 World War I training trenches

6.3.1.2 World War I Camp Upton foundations, structures, and cement roads

6.3.1.3 Gamma Forest site

6.3.1.4 19th Century Home Sites: W.J. Weeks House Site and the Weeks Campbell Site

6.3.2 The following tools shall be utilized to identify the location of these on site areas:

6.3.2.1 Sensitive Cultural Resources map: This map is produced by the CR program personnel and is considered for Limited Distribution due to sensitive information related to the location and protection of cultural resources.

Note: These areas have also been incorporated into the BNL Land Use Controls Map.

6.3.2.2 Cultural resource site files and project files.

6.4 Archeological Surveys: Based on the high degree of previous disturbance in the developed portion of the BNL site, archeological surveys do not typically need to be performed in the areas identified on Attachment 2. If ground-disturbing activities are planned for the following areas, archeological surveys are recommended prior to initiating excavation actions (see Attachment 3):

6.4.1 Fresh Water Sources: Areas in the immediate vicinity of fresh water sources at BNL (property within or adjacent to wetlands and other fresh water sources, especially near the Peconic River).

6.4.2 Culturally Sensitive Areas: Areas within the footprint of World War I era Camp Upton, the Civilian Conservation Corps period, and World War II era Camp Upton, that have not had major disturbance.

6.4.3 19th Century house sites: Within 100 feet surrounding these sensitive areas.

7.0 IMPLEMENTATION AND TRAINING

7.1 The CR program personnel are responsible for coordinating with departments/divisions the identification of appropriate project planning mechanisms in which cultural resource issues shall be integrated.

7.2 The CR program personnel are responsible for identifying and briefing personnel involved in project planning and work control programs that have the potential to affect cultural resources.

7.3 Staff responsible for implementing this procedure shall receive training and be thoroughly familiar with its contents and requirements. Each staff member shall document that they have read and understand the procedure.

8.0 REFERENCES

8.1 Environmental Guidelines for Development of Cultural Resource Management Plans (DOE/EH-0501).

8.2 SBMS Subject Area, National Environmental Policy Act (NEPA) and Cultural Resource Reviews.

8.3 World War I Camp Upton – BNL Site Overlay Map

8.4 Cultural Resource Management Plan for Brookhaven National Laboratory (BNL-xxxx-2013)

9.0 ATTACHMENTS

9.1 Attachment 1 – Cultural Significance Category Descriptions

9.2 Attachment 2 – Areas of Substantial Ground Disturbance

9.3 Attachment 3 – Archeologically Sensitive Areas

10.0 APPLICABLE FRAs/JRAs

10.1 None

11.0 EMS INFORMATION

11.1 Significant Environmental Aspects Associated with this Procedure - No Environmental Aspects have been directly associated with this procedure.

Please click here to acknowledge that you have read and understand this procedure.

Attachment 1

Cultural Significance Categories Table

Buildings, Features, and Archaeological Sites

Grid #	Bldg #	Building/Site Name	Date	NRHP Eligible	Category
Multi	N/A	World War I Training Trenches	1917	Yes	I
70/80	N/A	1800's Home Sites	1850's	U	I
65	701, 702	Brookhaven Graphite Research Reactor (BGRR)	1949	Yes	I
65	703	BGRR Office and Laboratories	1949	Note 1	I
64	902	Cosmotron	1949	U	I
64	913	Alternating Gradient Synchrotron	1957	U, C	I
84	490	Medical Research Center/Program	1958	U	I
84	491	Medical Research Reactor	1958	U	I
75	750	High Flux Beam Reactor	1964	Yes	I
74	555	Chemistry	1966	U, A	I
74	488	Berkner Hall	1968	U, A	I
109	364	Efficiency Apartment 40	1964	Yes	I
101	365	Efficiency Apartment 41	1964	Yes	I
101	366	Efficiency Apartment 42	1964	Yes	I
101	367	Efficiency Apartment 43	1964	Yes	I

Brookhaven Graphite Research Reactor (BGRR), High Flux Beam Reactor (HFBR), Alternating Gradient Synchrotron (AGS), and Other Support Buildings:

Grid #	Bldg #	Building Name	Date	NRHP Eligible	Category
65	705	Reactor Stack	1949	Note 1, 2	II
75	751	Cold Neutron Facility	1970	Note 2	II
65	801	Isotope Research and Processing	1950	Note 1	II
64	911	Collider Accelerator Building	1956	U, C	II
55	912	AGS Experimental Hall	1958	U, C	II
21/29	N/A	Gamma Forest Site	1961	U	II
75	901	Isochronous Cyclotrons	1949	U	II
75	901A	Tandem Van de Graaff Accelerator	1968	U	II

Representative Period Buildings

Grid #	Bldg #	Building Name	Date	NRHP Eligible	Category
93	30	Brookhaven Center	1934	No	II
75	120	Building 120	1942	No	II

Note 1 = Eligible as part of the BGRR Complex
Note 2 = Eligible as part of the HFBR Complexes
Note 3 = Resources with the following designations have not been formally evaluated for National Register eligibility (i.e., eligibility is undetermined)
A = Architecturally significant
C = Part of a complex
U = Undetermined

Category I: A building, site, or program determined to be historically significant due to historic context, architecture, engineering and design, direct association with important personages, or scientific achievement. The resource(s) may be individually eligible for listing on the National Register; however, eligibility is not a requirement.

Treatment and/or mitigation: Some degree of treatment and/or mitigation is necessary to ensure cultural significance is retained and available for interpretation. Examples include, but are not limited to:

- Specific treatment or architectural management plan, if architecturally significant
- Documentation of engineering and design, and scientific achievements (i.e., photos, scale models, document archives, etc.)
- Development of a Researcher's Guide
- Preservation/display of associated equipment

Category II: A building, facility, or site that directly supported a significant BNL program or uniquely represents a specific period in the evolution of BNL's site history and has had little alteration.

Treatment and/or mitigation:

Support Buildings: As-built drawings and photos; documented description of structure's role (may be included in existing facility description documents).

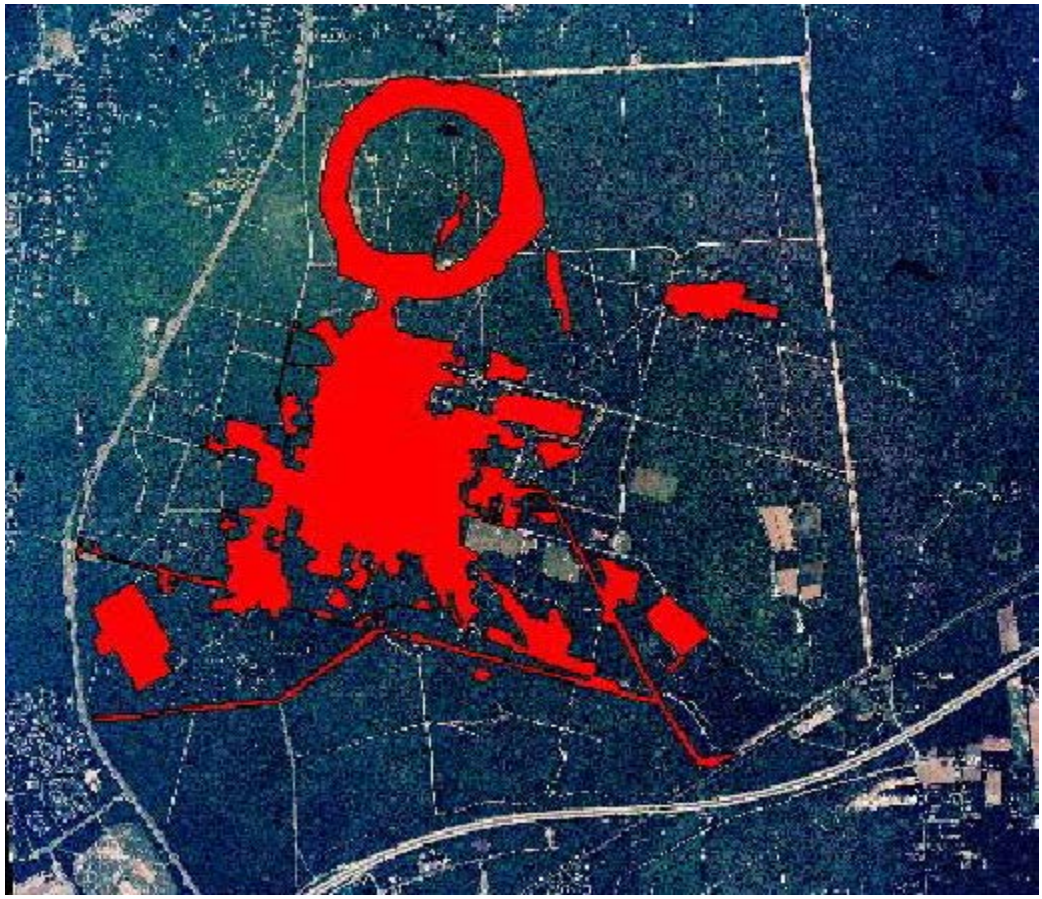
Period Structures: Treatment plans to minimize further alteration of specifically identified aspects (implementation is funding dependent). Mitigation shall entail documentation of as-built drawings and photos.

Category III: Buildings or structures that supported lab-wide programs and may be representative of the evolution of government use of the site. Buildings in this category include the World War II era buildings. During a site visit (January 3, 2003), a State Historic Preservation Officers agreed that these structures would not be considered eligible for the National Register. However, since these types of structures do represent a distinct period in the site and BNL history, the following means may be used to document the association.

Mitigation: Document the development and evolution of the site by archiving engineering and plan drawings of site layout, building plans and photos for select structures, and aerial photos.

Attachment 2

Areas of Substantial Ground Disturbance



Attachment 3

Archeologically Sensitive Areas

Prehistoric Period - Archeologically Sensitive Areas diagram is intentionally not shown

Contact BNL Cultural Resources Manager (x3091) for additional information

Prehistoric Period – Archeologically Sensitive Areas

The Historic Period - Archeologically Sensitive Areas diagram is intentionally not shown

Contact BNL Cultural Resources Manager (x3091) for additional information

Historic Period – Archeologically Sensitive Areas

ENVIRONMENT, SAFETY, AND HEALTH DIRECTORATE

BROOKHAVEN NATIONAL LABORATORY

REGULATORY COMPLIANCE PROCEDURE

BNL Historical Resource Identification Tag Program

The only official copy of this file is the one on line. Before using a printed copy, verify that it is the most current version by checking the document effective date on the web site.

PREPARED BY:

DocuSigned by: Timothy Green 8AFAA14BD19C46E...

Timothy Green
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Jason Remien
EPD Division Manager/Date 11/15/2021

EFFECTIVE DATE:

November 17, 2021

REVIEW CYCLE: 5 years

Filing Code: EC45ER.21

Revision Log

Section	Page #	Reason(s) for Revision	Rev. #	Date
All	All	Review cycle update; added Revision Log; miscellaneous editorial refinements.	1	11/3/06
2.0	3	Added responsibility for records maintenance.		
8.0	5	Removed hyperlink to referenced DOE document.		
All	All	Review cycle update; replace EWMSD with EPD throughout, changed directorate name in title box, changed Cultural Resource Coordinator to CR program personnel.	2	1/17/13
10.0	6	Added page 10.0	2	1/17/13
Attachment	7	Updated attachment to show example of actual aluminum tag being used.	3	3/11/16
All	All	Updated language throughout document to reflect actual practices.	3	3/11/16
11.0	6	Added section 11.0	3	3/11/16
All	All	Changed font to Arial as per new BNL standards	4	11/15/21
All	All	Updated language for readability	4	11/15/21
8	5	Removed reference to DOE Guidance Document which no longer exists.	4	11/15/21

1.0 PURPOSE AND SCOPE

The purpose of this procedure is to describe the implementation of the Brookhaven National Laboratory (BNL) Historical Resource Identification Tag System. The scope includes identification, application, tracking, and expectations associated with the program. Historical resources encompassed by this tagging program primarily include those items that are capable of being relocated. Very large items, buildings, and sites may be tracked through other means identified in the BNL Cultural Resource Management Plan, including listing within the Plan. The primary purpose for tagging these items is to identify them as significant or supporting resources, acknowledge responsibility, and to prevent inadvertent loss or disposal. Items in the Camp Upton Historical Collection are not included within the scope of the program.

Across the Laboratory, items have been identified as BNL Historical Resources. These objects have been determined to be unique to BNL or DOE and may represent a significant facility, program, site or event. These resources become increasingly significant, as facilities are decommissioned or renovated, and knowledgeable individuals retire. Key components to the BNL Cultural Resource Management Program include preserving the knowledge of BNL's historic and unique programs so it is available for interpretation and outreach to inform people of BNL's history and mitigating the effects of demolition actions.

2.0 RESPONSIBILITIES

2.1 The Cultural Resources Manager is responsible for administration of all aspects associated with this tagging program.

3.0 DEFINITIONS

3.1 Cultural Resources (i.e., Historical Resources) – Historic or prehistoric sites, artifacts, memorabilia, or other items of cultural importance; standing structures over 50 years of age, or those of importance because they represent a major historical theme or era; recent structures, facilities, equipment, and apparatus that have scientific significance or that are determined to be supporting assets.

4.0 PREREQUISITES

None

5.0 PRECAUTIONS

None

6.0 PROCEDURE

Identifying and maintaining accessibility of historical resources will help preserve BNL's history. In order to reduce the likelihood of historical items being inadvertently modified or disposed of, identification tags will be attached to the items. These tags will also support proper management and tracking of these valuable assets.

6.1 Resource Identification

6.1.1 Items that shall be considered BNL Historical Resources include, but are not limited to: equipment associated with a major or unique BNL facility or program (e.g., bubble chambers, BGRR tools, etc.); scale models of buildings, facilities, or equipment (i.e., Cosmotron model, HFBR and BGRR models, mock fuel elements, etc.); photographs or other visual displays that may be unique with regard to enlargement, mounting, etc., or would require significant resources or costs to replicate.

6.1.2 Items determined to be potential resources shall be tagged in order to minimize future loss.

6.1.3 Individuals or departments are encouraged to nominate items for consideration as historical resources.

6.2 Tagging Process (see Attachment 1, BNL Historical Resource Identification Tag)

6.2.1 BNL Cultural Resource (CR) program personnel shall complete the information in the Tagging Database and linked to a unique numbered tag in the format BNL-CR-xxxx.

6.2.2 Tags are manufactured aluminum tags with adhesive back for attachment to historic items.

6.2.3 Affix tag to the item in an indiscrete but easily noticed location. The adhesive will hold the tag on most items.

6.2.4 The tag shall be attached, when possible, in a non-prominent location (back or bottom) so that is does not damage or deface the item when the adhesive is removed.

Note: When practical to do so, tags shall be located so that they are not easily visible from the object's normal viewing angle but will be noticed if the object were moved.

6.2.4 Tags shall be replaced if the information becomes obsolete, or the tag is missing or damaged.

6.3 Tracking and Documentation

6.3.1 CR program personnel shall assess the status of items currently in the database each time the Cultural Resource Management Plan is updated, if resources allow.

7.0 IMPLEMENTATION AND TRAINING

7.1 CR program personnel shall brief affected personnel on the purpose, process, and responsibilities associated with this procedure.

7.2 New staff responsible for implementing this procedure shall receive training and be thoroughly familiar with its contents and requirements. Each staff member shall document that they have read and understand the procedure.

8.0 REFERENCES

8.1. Cultural Resource Management Plan for Brookhaven National Laboratory (BNL-100708-2013)

9.0 ATTACHMENTS

9.1 Attachment 1 – BNL Historical Resource Identification Tag

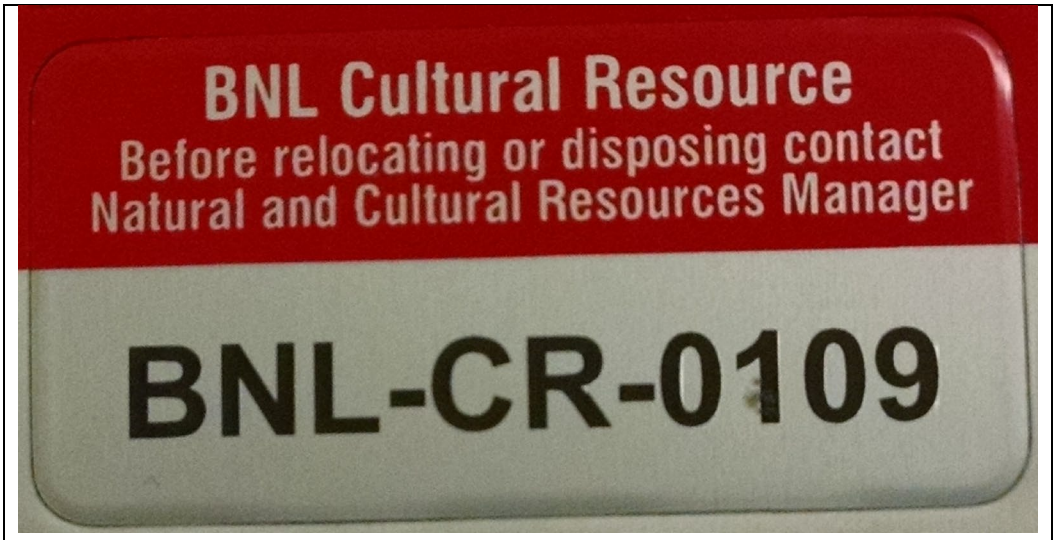
10.0 APPLICABLE FRAs/JRAs

10.1 None

11.0 EMS INFORMATION

11.1 Significant Environmental Aspects Associated with this Procedure - No Environmental Aspects have been directly associated with this procedure.

Attachment 1



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Date Received _____
Sent for Review_____
Control No. _____

Attachment 30

DI Form 1926 (Rev Sept 2004)
OMB No. 1024-0037
Exp. Date (06/30/2014)

United States Department of the Interior

Application for Permit for Archeological Investigations

Under the Authority of
The Archaeological Resources Protection Act of 1979
(16 U.S.C. 470aa-mm; 43 CFR 7);

and/or **The Antiquities Act of 1906**
(P.L. 59-209; 34 Stat. 225; 16 U.S.C. 431-433; 43 CFR 3)

and/or the appropriate **Bureau-specific statute** Such as
The Reclamation Act; The National Park Service Organic Act; The National Wildlife Refuge System Administration Act; The Federal Land Policy and Management Act

Instructions: Complete and return two copies of this application form and required attachments to the appropriate State or Regional Office of the land managing bureau involved. All information requested must be completed before the application will be considered. Use separate pages if more space is needed to complete a section.

1. **Name of applicant** (institution, corporation, partnership, individual, or other entity)

2. **Mailing address**

3. **Telephone number(s)**

4. **Email address(es)**

5. **Nature of archeological work proposed**

☐ Survey and Recordation

☐ Limited Testing and/or Collection (project-specific)

☐ Excavation and/or Removal (project-specific)

6. **Location of proposed work** (attach additional sheets)

a. Description of Federal lands involved. Indicate State, county, and Federal administrative unit. Specify the best available location data, e.g., GPS coordinates, UTM coordinates, township, range and section (cadastral) subdivisions, or metes and bounds. Include a readable copy of a map or plan at an appropriate scale showing specific areas for which permit is desired.

b. Identification of archeological resource(s) or other cultural resource(s) involved (if applicable).

7. **Time of proposed work**

Overall duration of project: From To

Estimated duration of fieldwork: From To

8. **Principal Investigator**

Name of individual(s) responsible for planning and generally overseeing field projects, including overall supervision of staff and overall responsibility for the professional quality of resource evaluations and recommendations.

Principal Investigator contact information

Telephone number(s):

Email address(es):

9. **Field Director** Name of individual(s) responsible for carrying out field projects, for technical quality of fieldwork through direct on-the-ground supervision of all aspects of fieldwork and data gathering, for proposing resource evaluations and recommendations for further treatment, and for preparing field records and descriptive reports.	**Field Director contact information** Telephone number(s): Email address(es):
10. **Permit Administrator** Name of individual responsible for fulfilling the terms and conditions of the permit (must be legally empowered to obligate applicant organization).	**Permit Administrator contact information** Telephone number(s): Email address(es):

11. **Applicant must include the following attached to the application form**.

a. Description of the purpose, nature, and extent of the work proposed, including how and why it is proposed to be conducted: (include research design, methods, curation);

b. Summary of organizational capabilities, including information on location(s) and description of facilities and equipment, on organizational structure and staffing, and on facilities, equipment and staff to be involved in the proposed work;

c. Summary of organizational history in completing work of the kind proposed, including similar past projects, government contracts, and Federal permits (previously held, currently in force with effective dates, and currently pending or planned, by agency and region/state), reports and/or publications resulting from similar work, and any other pertinent organizational experience;

d. For each individual named in 8 and 9 above, a curriculum vitae or similar resume or summary of education, training, and experience in the kind of work proposed and in the role proposed;

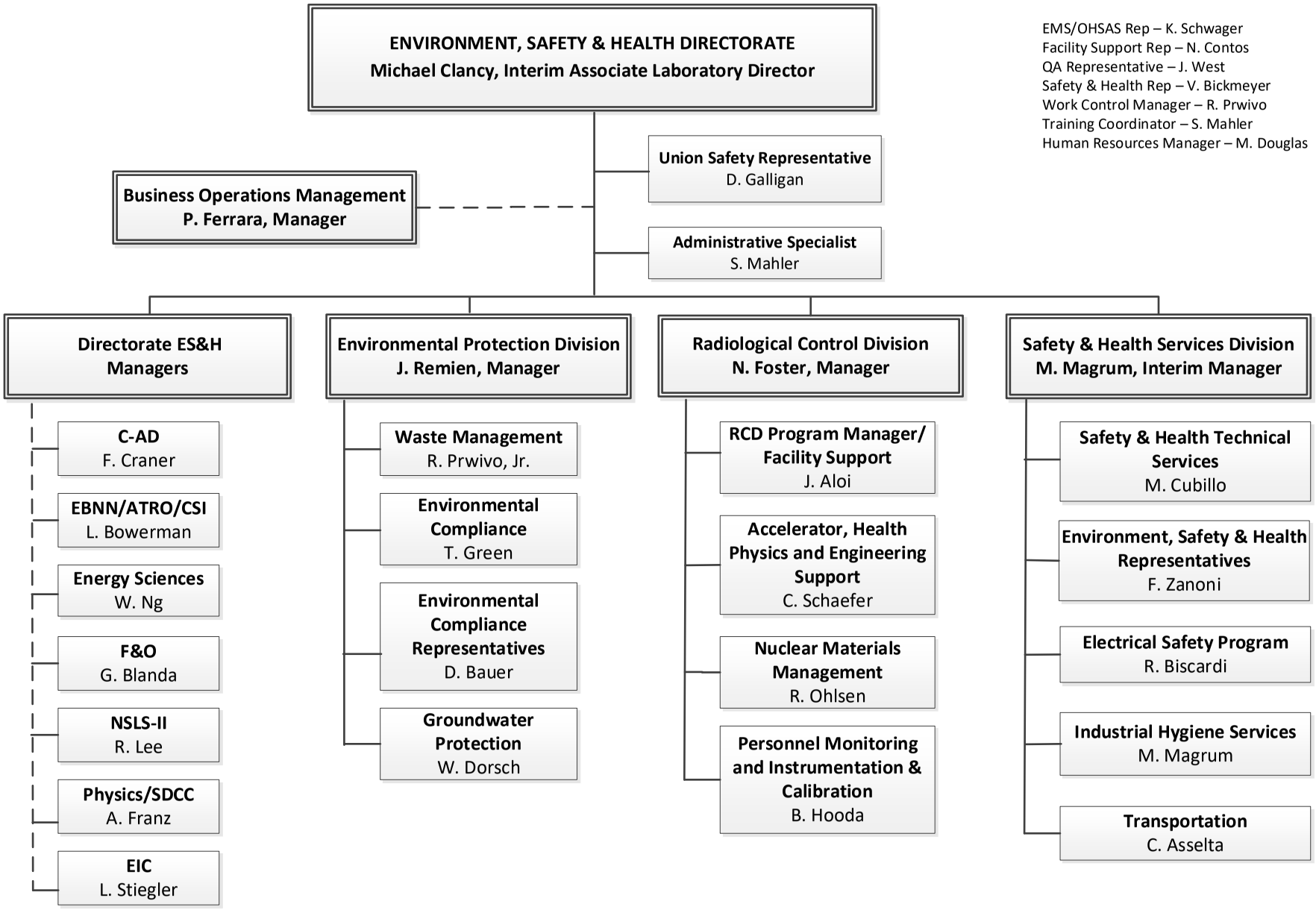
e. Written certification, signed by a properly authorized official of the proposed curatorial facility, attesting to the facility's capability and willingness to accept any collections, as applicable, and records, data, photographs, and other documents generated during the proposed term of the permit, and to assume permanent curatorial responsibility for such materials on behalf of the United States Government pursuant to 36 CFR 79. In the case of an application on Indian lands where the Indian Tribe or Indian owner(s) do not wish to take custody, written consent to undertake curation is required from the Indian Tribe or the Indian owner(s) pursuant to 25 CFR 262.8. Custody of any Native American human remains or cultural items subject to the Native American Graves Protection and Repatriation Act (NAGPRA), 25 USC 3001-3013, removed from public lands or Indian lands shall be determined in accordance with NAGPRA and its implementing regulations, 43 CFR 10.

12. **Proposed outlet(s) for public written dissemination of the results**

13. **Signature of individual named in 10**	14. **Date signed**

Paperwork Reduction Act and Estimated Burden Statement: This information is being collected pursuant to 16 U.S.C. 470cc and 470mm, to provide the necessary facts to enable the Federal land manager (1) to evaluate the applicant's professional qualifications and organizational capability to conduct the proposed archeological work; (2) to determine whether the proposed work would be in the public interest; (3) to verify the adequacy of arrangements for permanent curatorial preservation, as United States property, of specimens and records resulting from the proposed work; (4) to ensure that the proposed activities would not be inconsistent with any management plan applicable to the public lands involved; (5) to provide the necessary information needed to complete the Secretary's Report to Congress on Federal Archeology Programs; and (6) to allow the National Park Service to evaluate Federal archeological protection programs and assess compliance with the Archaeological Resources Protection Act of 1979 (16 U.S.C. 470). Submission of the information is required before the applicant may enjoy the benefit of using publicly owned archeological resources. To conduct such activities without a permit is punishable by felony-level criminal penalties, civil penalties, and forfeiture of property. A federal agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a valid OMB control number. Public reporting for this collection of information is estimated to average three hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the Departmental Consulting Archeologist; NPS; 1849 C Street, NW (2275); Washington, DC 20240-0001.

Attachment 31



Approved: _____

Michael Clancy, Interim Associate Laboratory Director

Environment, Safety & Health Directorate
Date: January 2023

Attachment 32
Résumé

Timothy Mathew Green
P.O. Box 916
Upton, NY 11973
H: (631) 696-1999
W: (631) 344-3091

Education:

Ph.D., Zoology, Texas A&M University, August 1993.

M.S., Zoology, Texas A&M University, May 1986.

B.S., Biology, West Texas State University, May 1983.

Experience:

May 2015 to Present — Section Manager – Environmental Compliance Section, Brookhaven Science Associates, Brookhaven National Laboratory. Responsible for ensuring BNL maintains compliance with all major state and federal environmental laws, preparation of annual documents, and management of six staff members consisting of subject matter experts in regulatory fields, while retaining responsibilities for natural and cultural resources.

Sep. 1999 to May 2015 — Project Engineer I – Cultural and Natural Resource Manager with Brookhaven Science Associates, Brookhaven National Laboratory. Responsible for all aspects of managing the Cultural and Natural Resources associated with the 5,265-acre site of BNL site. Responsibilities include representing BNL/BSA on multiple outside committees including Pine Barrens Commission, Peconic Estuary Program, Long Island Native Plant Initiative, and Long Island Invasive Species Management Area. Maintenance of fauna and floral monitoring program to document effects of BNL's operations on the environment. Supervision of two staff members, and 10-15 summer interns and cooperators. Manage the Foundation for Ecological Research in the Northeast (FERN).

Sep. 1998 to Sep. 1999 — Sectional Scientist with Mason & Hanger Corp. Pantex Plant, Amarillo, Texas. Coordinate scientific monitoring and characterization activities associated with playa management, plan and implement terrestrial invertebrate surveys, coordinate GIS/GPS needs for natural resources, plan and implement algae-eating fish experiments, serve as lead scientist for special permits, manage contracts, and act as

section manager in abscence of section manager.

Feb. 1998 – Sep. 1998: Section Manager over Pantex Plant's Water Program. This function provides technical support services, project reviews, and operations interface for water compliance issues. This includes communicating with Plant personnel on discharge limits, coordinating reporting of water effluents, ensuring the accuracy of water-related data, evaluating data to determine compliance status, assisting in preparing permit applications, providing subject matter expert review and interpretation of environmental regulatory and permitting requirements, input to environmental policy, procedures and guidance, and establishing requirements for sampling and monitoring systems necessary to comply with water requirements.

Jun. 1995 – Feb. 1998: Senior Project Scientist (Scientist IV) with Battelle Memorial Institute, Pantex Plant, Amarillo, Texas. Development and implementation of natural resource management plans concerning natural resources on 10,000 acres of Department of Energy owned land, National Environmental Policy Act compliance, Environmental Restoration support, coordination of outside contracts concerning biological research at Pantex Plant. Participation in the Playa Lakes Joint Venture. Management emphasis on Southern High Plains ecosystem and maintenance of local biodiversity.

Jan. 1995 – May 1995: Microbiology Instructor, Palo Verde Community College, Blythe, CA. Prepared lecture, lab, taught class.

Aug. 1994 – Jun. 1995: Acting Refuge Manager (GS-11) at Cibola National Wildlife Refuge, AZ. Develop and submit annual budgets, oversee and coordinate all operations of the refuge including public use, biological, operations and maintenance. Insure operations fall within budget. Coordinate with outside agencies, local, private and governmental bodies in operation of Refuge. Coordinate operation of Refuge within Ecosystem Management directives and within goals of Comprehensive Management Plan for Lower Colorado River Refuges Complex. Management of all facility staff, 7-9 individuals

Oct. 1994 – Jun. 1995: Refuge Operations Specialist (GS-11) at Cibola National Wildlife Refuge, AZ. Plan and maintain schedules for refuge operations and maintenance. Develop, plan major projects. Responsible for environmental assessments and permitting. Responsible for day to day operation of Refuge. Supervision of 3-4 staff.

1981 – Sept. 1994: Significant work experience related to natural resource management, teaching, and supervision available upon request.

Awards and Honors:

2013: Outstanding Advocate for Science and Technolology, Science Museum of Long Island

2012 Fellow of The Wildlife Society

2009 National Role Model Mentor Award presented by Minority Access, Inc.

2005 Brookhaven Award

2004 Environmental Quality Award, U.S. Environmental Protection Agency, Region 2

2004 Department of Energy Outstanding Mentor Award from the Office of Science Undergraduate Research Programs

2002 Department of Energy Outstanding Mentor Award from the Office of Science Undergraduate Research Programs

1998 Battelle Key Contributor Award for work on Algae-Eating Fish Research Project.

1995 Special Achievement Award, U.S. Fish and Wildlife Service.

1977 Eagle Scout, Boy Scouts of America.

Professional Societies:

1995 -Present The Wildlife Society, held multiple leadership positions at state, region, national levels.

Professional Training:

Certified Wildlife Biologist, National Environmental Policy Act training, National Historic Preservation Act training, RCRA, OSHA, Environmental Compliance training, Clean Water Act training, familiar with drinking water standards

Publications & Presented Papers:

Green, Timothy M. 1983. Distribution of Fish in Deaf Smith and Swisher Counties of the Texas Panhandle. Honor's Thesis. Department of Biology, West Texas State University.

Green, Timothy M. 1985. Pinnotheres jamesi synonymized with P. reticulatus (Decapoda: Brachyura). Proceedings of the Biological Society of Washington 98(3): 611-614.

Green, Timothy M. 1986. The relationship between Pinnixa chacei Wass and Callianassa islegrande Schmitt in the sandy beach community on Mustang Island, Texas. Master's Thesis. Texas A&M University.

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Biotelemetry. Proceedings AAZV, AAWV, AZA/NAG Joint Conference.

Figueras, M.P.; Green, T.M.; Burke, R.L. Consumption Patterns ofa Generalist Omnivore: Eastern Box Turtle Diets in the Long Island Pine Barrens. Diversity 2021, 13, 345. https://doi.org/10.3390/d13080345

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Emily Russavage, Jake Thiele, Joanna Lumbsden-Pinto, Kathy Schwager, Tim Green, and Martin Dovciak. 2020. Characterizing Canopy Openness in Open Forests: Spherical Densiometer and Canopy Photography Are Equivalent but Less Sensitive than Direct Measurements of Solar Radiation. Journal of Forestry, 2020, 1–11.

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Attachment 33

NOTE: Sensitive Information Not Shown – For General Distribution

Archeologically Sensitive Areas

Prehistoric Period - Archeologically Sensitive Areas diagram is intentionally not shown

Contact BNL Cultural Resources Coordinator for additional information

Prehistoric Period – Archeologically Sensitive Areas

Historic Period - Archeologically Sensitive Areas diagram is intentionally not shown

Contact BNL Cultural Resources Coordinator for additional information

Historic Period - Archeologically Sensitive Areas

Attachment 34

BNL ORAL HISTORY INTERVIEWS

INDIVIDUAL	TOPIC	DATE	INTERVIEWER	TAPE#	COMMENTS	FORMAT
Borst (3/4 masters)	BNL History	6/26/1986		1196		
Borst	BNL History	6/26/1986		1197-1201		
Plotkin	BNL History	3/13/1986		1202-1204		
Blewett	BNL History	3/17/1986		1205-1214		
Long	BNL History	6/24/1986		1215-1221		
Collins (3/4 masters)	BNL History	11.3/1983		1222		
Collins	BNL History	11/3/1983		1223-1226		
Morse	BNL History	1/26/1983		1227-1232		
Courant	BNL History	4/3/1986		1233-1236		
Sweet	BNL History	2/18/1983		1237-1241		
Goldhaber	BNL History	3/25/1986		1242-1245		
Powell	BNL History	3/3/1986		1246-1250		
Manowitz	BNL History	5/8/1986		1251-1253		
Mallory	BNL History	10/1/1982		1254/1258		
Nichols	BNL History	8/4/1983		1259-1263		
Rabi	BNL History	9/29/1982		1264-1268		
Smyth	BNL History	6/15/1983		1269-1272		
Vineyard	BNL History	3/20/1986		1273-1275		
Bacher	BNL History	10/1/1982		1276-1280		
Livingston	BNL History	10/1/1982		1281-1286		
Anderson	BNL History	3/14/1986		1287-1290		
Gurinsky	BNL History	4/18/1986		1291-1299		
Glasoe	BNL History	10/1/1982		1300-1303		
Fitch	BNL History	6/16/1983		1304-1307		
Kouts	BNL History	5/15/1986		1308-1312		
Higinbotham	BNL History	5/6/1986		1313-1316		
Love	BNL History	4/4/1986		1317-1319		
Mrs. Kupers	BNL History	3/11/1986		1320-1322		
Mr. Kupers	BNL History	3/11/1986		1323-1325		
Zacharias	BNL History	1/27/1983		1326-1329		
Rabi	BNL History	6/29/1983		1330-1332		
Tape	BNL History	3/9/1983		1333-1341		
Ramsey	BNL History	7/15/1982		1342-1347		
DuBridge	BNL History	12/1/1982		1348-1351		
Borst, Lyle	BGRR History	8/1/2000	R. Crease			
Chrien, Robert	BGRR History	8/1/2000	R. Crease			
Goldhaber, Maurice	BGRR History	8/1/2000	R. Crease			
Hastings, Julius	BGRR History	8/1/2000	R. Crease			
Hendrie, Joseph	BGRR History	8/1/2000	R. Crease			
Kouts, Herbert	BGRR History	8/1/2000	R. Crease			
Manowitz, Bernard	BGRR History	8/1/2000	R. Crease			
Marburger, John	BGRR History	8/1/2000	R. Crease			
Passell, Lawrence	BGRR History	8/1/2000	R. Crease			
Philips, Jack	BGRR History	8/1/2000	R. Crease			

Attachment 35

Powell, Robert	BGRR History	8/1/2000	R. Crease			
Rorer, David	BGRR History	8/1/2000	R. Crease			
Frei, Haskel	BGRR History	8/1/2000	R. Crease			
Schweller, David	BGRR History	8/1/2000	R. Crease			
Davis, Raymond	Neutrinos		R. Crease			
Lee, T.D.	Cosmotron		R. Crease			
Polk, Irving (Irv)	Cosmotron		R. Crease			
Courant, David	Cosmotron		R. Crease			
Alberger, David	Cosmotron		R. Crease			
Watson, Richard (Dick)	NSLS/Physics	7/20/2004	R. Crease			DVC-PRO & DVD backup
Blume, Martin	NSLS/Physics	7/20/2004	R. Crease			DVC-PRO & DVD backup
Friedlander, Gerhardt	Chemistry	7/29/2004	R. Crease			DVC-PRO & DVD backup
Krinsky, Samuel	NSLS	8/5/2004	R. Crease			DVC-PRO & DVD backup

Attachment 36

BNL Oral History Program – Overview & Planning Document

Overview: The purpose of this document is to establish a process for developing a formal oral history (OH) program at BNL. The scope of the program will include identification and tracking of existing video and audio interviews, process development, program roles and responsibilities.

The BNL Cultural Resource Management Program (part of the Environmental Protection Division) assumes responsibility for this program, working in close coordination with the Community Relations & Public Affairs Directorate, and BNL Science Historian, Robert Crease. Development of this process is expected to evolve and build upon early experiences.

I. General

A. The BNL Oral History Program will, to the extent practical, follow the guidelines presented in the draft document "Handbook for Oral History in the National Park Service", June 2004 by Janet A. McDonnell, available at the National Park Service (NPS) website.

B. Interviews associated with the oral history program should be coordinated through the BNL Cultural Resources program.

II. Interview Topics

A. Topics and individuals to be interviewed may be determined by various means including, but not limited to:
   i. Established OH program priority
   ii. Departmental recommendations
   iii. Special projects
   iv. Thematic programs

B. The OH program will strive to develop a "routine" schedule or priority for interviews. However, a special theme or project series may also be conducted.

III. Background/Research

Ideally, research should be conducted into the background of the individual, in order to ensure a thorough and smooth interview.

A. Departmental Questionnaire: Attachment 1 presents an example of a questionnaire that may be forwarded to departments in order to develop background information.

B. All background materials and resource lists shall become part of the "interview documentation package".

IV. Interviews

A. Interviews may be conducted by the following personnel:
   - T. Green

- Other (or other designated CEGPA representative)

B. Interviews may be conducted with assistance from an individual associated with the interviewee's department/program, in order to have subject matter expertise and/or familiarization with the individual's background.

V. Process

A. Identify Individual(s) to be interviewed
   i. If warranted - Distribute memo to department(s) soliciting recommendations
   ii. Potential prioritization
      1. Age/Health
      2. Scientific achievement/program association
      3. Duration of BNL employment

B. Conduct background research using one or more of the following resources
   i. Distribute questionnaire to department(s)
   ii. Talk with coworkers and others knowledgeable
   iii. Utilize Public Affairs resources
   iv. Conduct audio interviews prior to video to identify focus/avoidance topics. (Crease's method)

C. Develop interview topics & questions (note: include in "interview document package").

D. Schedule & conduct interview.

E. Revise OH database and file "interview document package", containing: Background information/notes, reference list, interview questions/topics, etc.

F. Video reviewed and edited per Community Relations Group recommendations.

VI. Documentation

A. Develop a listing/database of existing video and audio interviews
B. Identify current storage location(s) and responsible individuals
   i. Evaluate potential to centralize storage/responsibility
C. Develop/distribute annual memo acknowledging existence, location and responsibility – if determined necessary.
D. Establish preferred medium(s)
E. Establish consistent marking/archive system

VII. Video Use

A. Develop protocols for permitting access to interviews/documents; consider addressing the following aspects:
   i. Notification of availability: Mentioned with other CR information/ websites CR & BNL history/Bulletin articles

ii. Raw interview tapes, database lists, database identification of related files (research files)
iii. CRC to contact other DOE facilities & Pantex for their process
iv. Must submit request via phone, email, letter
v. Develop form to request access
vi. View at BNL video

B. Evaluate other potential uses, such as:
   i. Website - Video clips linked with text (Similar to SLAC website?)

Revised 12/12/2012

MEMORANDUM OF AGREEMENT

BROOKHAVEN GRAPHITE RESEARCH REACTOR,

WHEREAS, the U.S. Department of Energy, Brookhaven Group (DOE) has determined that the Brookhaven Graphite Research Reactor (BGRR) Complex at the Brookhaven National Laboratory (BNL) is eligible for inclusion in the National Register of Historic Places, and that decommissioning would have an adverse effect on this property, and has consulted with the New York State Historic Preservation Officer (SHPO) pursuant to 36 CFR 800, regulations implementing Section 106 of the National Historic Preservation Act (16 USC 470f); and

WHEREAS, Federal agencies are required to seek ways to avoid, minimize, or mitigate adverse effects on historic properties under the provisions of 36 CFR 800.6; and

WHEREAS, recordation of historic properties is required of Federal agencies by Section 110(b) of the National Historic Preservation Act whenever an agency action may substantially alter or demolish an historic property; and

WHEREAS, the Advisory Council on Historic Preservation (ACHP) has promoted the use of innovative mitigation measures that place the resource and its value before the public.

NOW THEREFORE, DOE and the SHPO agree that the undertaking shall be implemented in accordance with the following in order to take into account the effects of the undertaking on this historic property.

Upon execution of this agreement, DOE will ensure that the following measures are carried out, subject to the availability of appropriated funds:

A. Documentation, Interpretation, Curation

Mitigation measures for the Brookhaven Graphite Research Reactor Complex are:

1. Create a "Researcher's Guide" to the BGRR. In creating this guide, DOE will locate and curate documents, drawings, manuals, oral histories, photographs, and video or movie footage pertaining to BGRR and the primary operational support facilities to be impacted through decommissioning [i.e., the Fan House (Bldg. 704), the Instrument House (Bldg. 708), the Canal House (Bldg. 709) and the Water Treatment House (Bldg. 709A)]. DOE will seek to assemble information that depicts BGRR at various stages of use over its operational lifetime. In creating the Researcher's Guide, DOE will utilize both published materials as well as records and documents retained in the BNL archives.

2. Using best efforts, DOE will develop a visual record of the operational history of BGRR derived from information and individuals located and/or identified in creating the Researcher's Guide. The format will be a "virtual tour" of the facilities conducted by both researchers and support staff who worked within BGRR over its lifetime. Their accounts will illustrate and personalize the significance of the work conducted. These will include:

   a. A video documentary – the video will be a minimum of ½ hour in length, and will be produced to broadcast standards. The video would walk the "visitor" through the facility and interpret its operation through historic documentation and on-camera or recorded interviews with former researchers and staff. The video will be made available through the BNL Research Library and BNL Science Museum for individual viewing or presentations at public forums, through local media outlets, and, potentially, through national release either independently or as part of a DOE-complex-wide documentary.

b. An interactive CD – t CD, compiled from the video and supplem.. ted with current and historic documentation, will be produced in a format compatible for use with personal computers. The CD is intended for release to on-site, local, regional, and national museums, schools, and libraries. Users would have the ability to select subjects of interest and scan the disk for appropriate text, photos, or video clips.

At their discretion, the SHPO will participate in the review and selection of materials to be used in the production of the video and CD. Upon completion, draft copies of the video and CD will be provided to the SHPO for review.

3. Final products, together with original drawings, photographs, negatives, or interviews created in support of this MOA, will be deposited at the BNL Research Library. Copies of the final products will be filed with the SHPO and other repositories as determined appropriate.

4. Prior to decommissioning, DOE will assess the contents of BGRR and its operational support facilities to determine whether items with educational or interpretive potential for use in local, state, regional, or national museums are present. Collections made in support of this MOA will be curated with DOE and will be available for public interpretation through loan or assignment.

B. Administrative Conditions

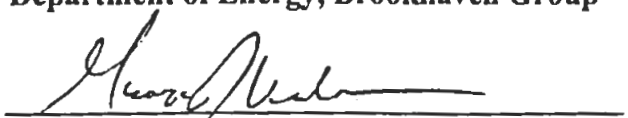
1. Should the SHPO object within thirty (30) days after receipt to any plans, specifications, contracts, or other documents provided for review pursuant to this agreement, or to the manner in which this agreement is being implemented, DOE shall consult with the SHPO to resolve the objection. If DOE determines that the objection cannot be resolved, DOE shall forward all documentation relevant to the dispute to the Advisory Council on Historic Preservation in accordance with 36 CFR 800.7(a)(1). Within forty-five (45) days after receipt of all pertinent documentation, the Council will either:

   (a) provide DOE with recommendations, which DOE will take into account in reaching a final decision regarding the dispute; or

   (b) notify DOE that it will comment pursuant to 36 CFR 800.7(c) and proceed to comment. Any Council comment provided in response to such a request will be taken into account by DOE in accordance with 36 CFR 800.7(c)(4).

Execution of this Memorandum of Agreement by DOE and the New York SHPO and implementation of its terms are evidence that DOE has afforded the Council an opportunity to comment on the impact that decommissioning has on the BGRR Complex, and that DOE has taken into account the effects of the undertaking on this property.

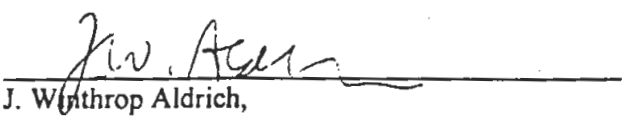
Department of Energy, Brookhaven Group



George J. Malosh
Brookhaven Group Manager

3/27/00
Date

New York State Historic Preservation Officer



J. Winthrop Aldrich,
Deputy Commissioner for
Historic Preservation

6 April '00
Date

MEMORANDUM OF AGREEMENT BETWEEN U.S. DEPARTMENT OF ENERGY (DOE) BROOKHAVEN SITE OFFICE (BHSO) AND THE NEW YORK STATE HISTORIC PRESERVATION OFFICE (SHPO) REGARDING THE DISCOVERY PARK DEVELOPMENT AND DEMOLITION OF BUILDINGS 364, 365, 366, AND 367 WITHIN THE TOWN OF BROOKHAVEN, SUFFOLK COUNTY, NEW YORK

WHEREAS, DOE BHSO determined that the 1960s Era Efficiency Apartments (Buildings 364, 365, 366, and 367) are eligible for inclusion in the National Register of Historic Places, and the development of Discovery Park would require the demolition of these structures, thereby creating an adverse effect, and having consulted with the New York State Historic Preservation Officer (SHPO) pursuant to 36 CFR 800, regulations implementing Section 106 of the National Historic Preservation Act (16 USC 470f); and

WHEREAS, the SHPO, in a letter to DOE BHSO dated October 7, 2016, concurred with the determination that the 1960s era efficiency apartments, Buildings 364 - 367, are eligible for inclusion in the National Register of Historic Places, under Criterion A, because these buildings represent a period of BNL history where increased funding was obtained in the field of atomic research, resulting in, among other things, the construction of these purpose-built housing units and Criterion C, as these buildings are unique examples of Mid-Century Modern architecture; and

WHEREAS, DOE BHSO previously communicated to the SHPO of the planned development of Discovery Park and provided an Alternatives Analysis for Disposition of Buildings 364 - 367 1960s Era Efficiency Apartments indicating that no feasible alternatives to preservation are available; and

WHEREAS, SHPO, in a letter to BHSO dated June 6, 2018, indicated that due to a lack of prudent and feasible alternatives exist that the Discovery Park Development will have an Adverse Effect upon historic resources; and

WHEREAS, recordation of historic properties is required of Federal agencies by Section 110(b) of the National Historic Preservation Act whenever an agency action may substantially alter or demolish an historic property; and

NOW, THEREFORE, DOE BHSO and the SHPO agree that the undertaking shall be implemented in accordance with the following stipulations in order to take into account the effect of the undertaking on the historic property, and to satisfy the Section 106 review requirements for this undertaking up to and including demolition of Buildings 364 - 367:

I. Stipulations

A. DOE BHSO shall ensure that the following mitigation actions are carried out. Upon completion of the mitigation actions described in this section, it is agreed that no additional notifications or submittals to the SHPO are needed for modifications or demolition of Buildings 364 - 367:

1. An architectural evaluation of Buildings 364 - 367 will be conducted and appropriate photo documentation of the structures in their current state along with construction drawings will be incorporated in a report.

2. Photographic documentation of representative apartments, following recordation standards provided with SHPO's letter dated June 6, 2018, and incorporated into a formal report. (Recordation of Historic Structures attached)

3. Digitization of all original construction drawings, drawings associated with conversion of the storage closet, Building 367, to apartment space, and roof replacement drawings for Buildings 365 and 366.

4. Final Compilation of Documentation: One copy of the final compilation of documentation in electronic format (CD or DVD) will be submitted to SHPO and one copy will be forwarded to the BNL Research Library. One printed copy on archivally stable paper shall be provided to the SHPO for forwarding to the New York State Archives.

5. Development and placement of interpretive kiosks presenting the history of the Apartment Area including the 1960s era apartments. Placement will be located in public areas accessible to visitors to both BNL and Discovery Park. SHPO will participate in the development of kiosks.

a. The first Kiosk will address the history of the Apartment Area and its use from WW I through to present.

b. The second Kiosk will describe the 1960s era apartments and their significance to the development of the Laboratory

c. Additional Kiosks will be developed in consultation with SHPO and may include the following areas:

   i. WW I hospital, and its involvement with the 1918 pandemic flu

   ii. The appearance of the area during the CCC era

   iii. During WW II the redevelopment as a hospital and use for the Chemistry Department and housing.

   iv. The concept for Discovery Park and how it relates to the Brookhaven National Laboratory.

B. Schedule

Demolition of Buildings 364 - 367 may proceed once SHPO has reviewed and concurred with the stipulation listed in Section I.A above, via written confirmation delivered on SHPO letterhead. Photographs of the building(s) for the documentation required shall be completed prior to demolition commencing. Completed documentation and Final Compilation of Documentation will be submitted to SHPO no later than six months after demolition of the last building occurs.

II. Monitoring

The SHPO may monitor activities carried out pursuant to this Agreement if so requested pursuant to 36 CFR 800.6(c)(4).

While at BNL, the SHPO representative(s) shall comply with DOE health, safety, and security measures.

III. Post-Review Discoveries

If historic resources are discovered or unanticipated effects on historic resources occur during execution of the undertaking, DOE BHSO will notify the SHPO and make reasonable efforts to avoid, minimize or mitigate adverse effects on such resources. BNL and SHPO shall be guided by steps established in 36 CFR Section 800.13.

VI. Effective Date, Duration, and Termination of Agreement

The effective date of this Agreement is the most recent signature date shown on the signature page and will expire if its terms are not carried out within five (5) years of the date of its execution; or until amendment or termination is proposed by either party with at least three (3) months written notice to allow the parties to consult during the three (3) month period to seek agreement. In the event of termination, DOE will continue to comply with applicable requirements in 36 CFR Section 800, with regard to undertakings covered by this Agreement.

VII. Execution of Agreement

Execution of this Agreement by DOE BHSO and SHPO, and the implementation of its terms, are evidence that DOE and BNL have informed ACHP and afforded a reasonable opportunity for the Consulting Parties to comment on the undertaking, and that DOE and BNL have satisfied its historic preservation responsibilities under Section 106 of the National Historic Preservation Act.

VIII. Dispute Resolution

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

A. Forward all documentation relevant to the dispute, including the DOE's proposed resolution, to the ACHP. The ACHP shall provide DOE with its advice on the resolution of the objection within thirty (30) days of

receiving adequate documentation. Prior to reaching a final decision on the dispute, DOE shall prepare a written response that takes into account any timely advice or comments regarding the dispute from the ACHP, signatories and concurring parties, and provide them with a copy of this written response. DOE will then proceed according to its final decision.

B. If the ACHP does not provide its advice regarding the dispute within the thirty (30) daytime period, DOE may make a final decision on the dispute and proceed accordingly. Prior to reaching such a final decision, DOE shall prepare a written response that takes into account any timely comments regarding the dispute from the signatories and concurring parties to the MOA and provide them and the ACHP with a copy of such written response.

C. DOE's responsibility to carry out all other actions subject to the terms of this MOA that are not the subject of the dispute remain unchanged.

IX. Amendments

This MOA may be amended when such an amendment is agreed to in writing by all signatories. The amendment will be effective on the date a copy signed by all of the signatories is filed with the ACHP. 36 CFR 800.5(c) shall govern the execution of any such amendment.

X. Termination

Termination of the MOA will be governed by 36 CFR 800.5(c).

If any signatory to this MOA determines that its terms will not or cannot be carried out, that party shall immediately consult with the other parties to attempt to develop an amendment per Stipulation IX, above. If within thirty (30) days (or another time period agreed to by all signatories) an amendment cannot be reached, any signatory may terminate the MOA upon written notification to the other signatories.

Once the MOA is terminated, and prior to work continuing on the undertaking, DOE must either (a) execute a MOA pursuant to 36 CFR § 800.6, or (b) request, take into account, and respond to the comments of the ACHP under 36 CFR § 800.7. DOE shall notify the signatories as to the course of action it will pursue.

Signatories

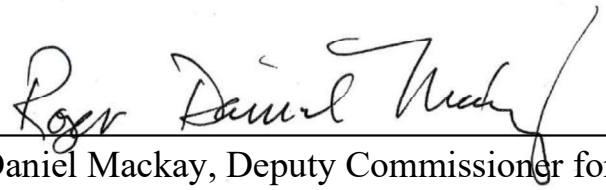
U.S. Department of Energy, Brookhaven Site Office

7/8/2020

Robert Gordon
Manager, Brookhaven Site Office

Date

New York State Historic Preservation Office



7/10/2020

Daniel Mackay, Deputy Commissioner for Historic Preservation/Deputy New York State Historic Preservation Office, New York State Office of Parks, Recreation and Historic Preservation

Date

Photographs

- Photographs submitted as documentation should be clear, well-composed, and provide an accurate visual representation of the property and its significant features. Submit as many photographs as needed to depict the current condition and significant features of the property.

- Digital photographs should be taken using a ten (10) mega pixel or greater digital SLR camera.

- Images should be saved in Tag Image File format (TIFF) or RAW format images. This allows for the best image resolution. RGB color digital TIFFs are preferred.

- Selected images for documentation package should be printed as follows: 1-3, 8 by 10-inch views of the overall facility. Sufficient 5 by 7-inch additional images to fully document the present condition of all elevations at the facility (several interior images should be included).

  Several historic images (if available) depicting the facility should be reprinted at the 5 by 7-inch size and included in the documentation.

- Images should be printed on a high-quality color printer on compatible high-quality photographic paper stock (HP printer us HP Paper, Epson printer use Epson paper)

- Each photograph must be numbered and that number must correspond to the photograph number on a photo log or key. For simplicity, the name of the photographer, photo date, etc. may be listed once on the photograph log and doesn't need to be labeled on every photograph.

- Write the label information within the white margin on the front of the photograph using an archival photo labeling pen. Label information can also be generated by computer and printed directly in the white margin (no adhesive labels).

- Do not print information on the actual image – use only the photo margin or back of the photograph for labeling.

- At a minimum, photographic labels must include the following information: Photograph number, Name of the Property, County, and State.

- Photos should be placed in archival quality photo sleeves. Two (2) sets of images should be produced.

Historic Narrative

An historic narrative pertaining to the history of the structure to illustrate the historic importance of the complex should be prepared by pulling together the existing histories of the brewer buildings into a single document. The narrative will provide an appropriate historic context for the structure.

Report
One hard copy of the report is requested for OPRHP to forward to the State Archives. The final report including images and a PDF version of the Historic Narrative should be saved on digital media (CD or DVD) and included with each of the final bound documentation package.

MEMORANDUM OF AGREEMENT

BETWEEN U.S. DEPARTMENT OF ENERGY (DOE) BROOKHAVEN SITE OFFICE (BHSO) AND THE NEW YORK STATE HISTORIC PRESERVATION OFFICE (SHPO) REGARDING DEMOLITION OF THE BROOKHAVEN MEDICAL RESEARCH REACTOR (BMRR) STACK WITHIN THE TOWN OF BROOKHAVEN, SUFFOLK COUNTY, NEW YORK

WHEREAS, the DOE-BHSO determined that the BMRR stack is eligible for inclusion in the National Register of Historic Places, and the planned demolition of the BMRR stack to eliminate safety and contamination concerns, thereby creating an adverse effect, and having consulted with the New York State Historic Preservation Officer (SHPO) pursuant to 36 CFR 800, regulations implementing Section 106 of the National Historic Preservation Act (16 USC 470f); and

WHEREAS, the SHPO, in a letter to DOE-BHSO dated May 12, 2021 that the Brookhaven Medical Reactor (BMRR) stack is eligible for inclusion in the National Register of Historic Places, under Criterion A (BMRR), because this structure is part of a larger facility that represents a period of BNL history and

WHEREAS, DOE-BHSO previously communicated to the SHPO of the planned demolition of the BMRR stack indicating that no feasible alternatives to preservation are available because of the condition of the stack and need to remove radiological contamination; and

WHEREAS, SHPO, in a letter to BHSO dated March 3, 2022 indicated that the BMRR Stack demolition project will have an Adverse Effect upon historic resources; and

WHEREAS, recordation of historic properties is required of Federal agencies by Section 110(b) of the National Historic Preservation Act whenever an agency action may substantially alter or demolish an historic property; and

NOW, THEREFORE, DOE-BHSO and the SHPO agree that the undertaking shall be implemented in accordance with the following stipulations in order to take into account the effect of the undertaking on the historic property, and to satisfy the Section 106 review requirements for this undertaking up to and including demolition of the BMRR stack:

I. Stipulations

A. DOE-BHSO shall ensure that the following mitigation actions are carried out. Upon completion of the mitigation actions described in this section, it is agreed that no additional notifications or submittals to the SHPO are needed for demolition of the BMRR:

1. An architectural evaluation of the BMRR will be conducted and appropriate photo documentation of the structure in its current state along with construction drawings will be incorporated in a report (previously submitted to SHPO for the Medical Complex).
2. Photographic documentation of the BMRR stack, following recordation standards included in appendix A, and incorporated into a formal report. SHPO to review electronic proof copies of photos.
3. Development of one or more kiosks describing the history of the Medical Complex and Brookhaven Medical Research Reactor for placement near the entrance to building 490. SHPO will be provided the opportunity to review the content of the kiosks.
4. Final Compilation of Documentation: One copy of the final compilation of documentation in electronic format will be submitted to SHPO and one copy will be forwarded to the Brookhaven National Laboratory Research Library. One printed copy on archivally stable paper shall be provided to the SHPO for forwarding to the New York State Archives.

B. Schedule

Demolition of the BMRR stack may proceed once SHPO has reviewed and concurred with the stipulation listed in Section I.A.2 above, via written confirmation delivered on SHPO letterhead. Completed documentation and Final Compilation of Documentation will be submitted to SHPO no later than six months after demolition of the stack occurs and design and installation of kiosks will be complete by end of 2023.

II. Monitoring

The SHPO may monitor activities carried out pursuant to this Agreement if so requested pursuant to 36 CFR 800.6(c)(4).

While at BNL, the SHPO representative(s) shall comply with DOE health, safety, and security measures.

III. Post-Review Discoveries

If historic resources are discovered or unanticipated effects on historic resources occur during execution of the undertaking, DOE-BHSO will notify the SHPO and make reasonable efforts to avoid, minimize or mitigate adverse effects on such resources. BNL and SHPO shall be guided by steps established in 36 CFR Section 800.13.

IV. Effective Date, Duration and Termination of Agreement

The effective date of this Agreement is the most recent signature date shown below and will expire if its terms are not carried out within five (5) years of the date of its execution; or until amendment or termination is proposed by either party with at least 3 months written notice to allow the parties to consult during the 3-month period to seek agreement. In the event of termination, DOE will continue to comply with applicable requirements in 36 CFR Section 800, with regard to undertakings covered by this Agreement.

V. Execution of Agreement

Execution of this Agreement by DOE-BHSO, and SHPO, and the implementation of its terms, are evidence that DOE and BNL have informed ACHP and afforded a reasonable opportunity for the Consulting Parties to comment on the undertaking, and that DOE and BNL have satisfied its historic preservation responsibilities under Section 106 of the National Historic Preservation Act.

VI. Dispute Resolution

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

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

B. If the ACHP does not provide its advice regarding the dispute within the thirty (30) daytime period, DOE may make a final decision on the dispute and proceed accordingly. Prior to reaching such a final decision, DOE shall prepare a written response that takes into account any timely comments regarding the dispute from the signatories and concurring parties to the MOA and provide them and the ACHP with a copy of such written response.

C. DOE's responsibility to carry out all other actions subject to the terms of this MOA that are not the subject of the dispute remain unchanged.

VII. Amendments

This MOA may be amended when such an amendment is agreed to in writing by all signatories. The amendment will be effective on the date a copy signed by all of the signatories is filed with the ACHP. 36 CFR 800.5(c) shall govern the execution of any such amendment.

VII. Termination

Termination of the MOA will be governed by 36 CFR 800.5(c).

If any signatory to this MOA determines that its terms will not or cannot be carried out, that party shall immediately consult with the other parties to attempt to develop an amendment per Stipulation IX, above. If within thirty (30) days (or another time period agreed to by all signatories) an amendment cannot be reached, any signatory may terminate the MOA upon written notification to the other signatories.

Once the MOA is terminated, and prior to work continuing on the undertaking, DOE must either (a) execute a MOA pursuant to 36 CFR § 800.6, or (b) request,

take into account, and respond to the comments of the ACHP under 36 CFR § 800.7. DOE shall notify the signatories as to the course of action it will pursue.

Signatories

U.S. Department of Energy, Brookhaven Site Office

ROBERT GORDON Digitally signed by ROBERT GORDON Date: 2022.06.14 15:29:48 -04'00' 6/14/22

Robert P. Gordon Date

Manager, Brookhaven Site Office

New York State Historic Preservation Office

Daniel Mackay 7/6/2022

Daniel Mackay, Deputy Commissioner for Historic Preservation/Deputy New York State Historic Preservation Office, New York State Office of Parks, Recreation and Historic Preservation Date

RECORDATION OF HISTORIC STRUCTURES

Photographs

- Photographs submitted as documentation should be clear, well-composed, and provide an accurate visual representation of the property and its significant features. Submit as many photographs as needed to depict the current condition and significant features of the property.
- Digital photographs should be taken using a ten (10) mega pixel or greater digital SLR camera.
- Images should be saved in Tag Image File format (TIFF) or RAW format images. This allows for the best image resolution. RGB color digital TIFFs are preferred.
- Selected images for documentation package should be printed as follows: 1-3, 8 by 10 inch views of the overall facility. Sufficient 5 by 7 inch additional images to fully document the present condition of all elevations at the facility (several interior images should be included).
  Several historic images (if available) depicting the facility should be reprinted at the 5 by 7 inch size and included in the documentation.
- Images should be printed on a high quality color printer on compatible high quality photographic paper stock (HP printer us HP Paper, Epson printer use Epson paper)
- Each photograph must be numbered and that number must correspond to the photograph number on a photo log or key. For simplicity, the name of the photographer, photo date, etc. may be listed once on the photograph log and doesn't need to be labeled on every photograph.
- Write the label information within the white margin on the front of the photograph using an archival photo labeling pen. Label information can also be generated by computer and printed directly in the white margin (no adhesive labels).
- Do not print information on the actual image – use only the photo margin or back of the photograph for labeling.
- At a minimum, photographic labels must include the following information: Photograph number, Name of the Property, County, and State.
- Photos should be placed in archival quality photo sleeves. Two (2) sets of images should be produced.

Historic Narrative

An historic narrative pertaining to the history of the structure to illustrate the historic importance of the complex should be prepared by pulling together the existing histories of the brewer buildings into a single document. The narrative will provide an appropriate historic context for the structure.

Report

One hard copy of the report is requested for OPRHP to forward to the State Archives. The final report including images and a PDF version of the Historic Narrative should be saved on digital media (CD or DVD) and included with each of the final bound documentation package.