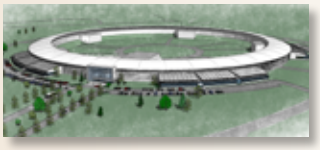
BROOKHAVEN
NATIONAL LABORATORY



10 year site plan

July 2007

BNL-73222-2007-IR

Brookhaven National Laboratory

10 year site plan

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One of ten national laboratories overseen and primarily funded by the Office of Science of the U.S. Department of Energy (DOE), Brookhaven National Laboratory conducts research in the physical, biomedical, and environmental sciences, as well as in energy technologies and national security. Brookhaven Lab also builds and operates major scientific facilities available to university, industry and government researchers. Brookhaven is operated and managed for DOE's Office of Science by Brookhaven Science Associates, a limited-liability company founded by Stony Brook University, the largest academic user of Laboratory facilities, and Battelle, a nonprofit, applied science and technology organization.

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ACRONYMS AND ABBREVIATIONS

3PBP	Project, Planning, Programming and Budgeting Process
ADA	Americans with Disabilities Act
AGS	Alternating Gradient Synchrotron
AIP	Accelerator Improvement Project
ALP	Annual Laboratory Plan
ASCR	Office of Advanced Scientific Computing Research
ATF	Accelerator Test Facility
BER	DOE Office of Biological and Environmental Research
BES	DOE Office of Basic Energy Sciences
BGRR	Brookhaven Graphite Research Reactor
BHSO	DOE Brookhaven Site Office
BNL	Brookhaven National Laboratory
CCC	Civilian Conservation Corps
BSA	Brookhaven Science Associates
CAMP	Capital Asset Management Plan
CD-0	Critical Decision Zero (Approve Mission Need)
CD-1	Critical Decision One (Approve Alternative Selection and Cost Range)
CDR	Conceptual Design Report
CFN	Center for Functional Nanomaterials
CGC	Color Glass Condensate
CTN	Center for Translational Neuroimaging
D0	DZero (a worldwide collaboration at Fermi National Accelerator Laboratory)
D&D	Decontamination & Decommissioning
DOE	Department of Energy
EENS	Energy, Environmental, and National Security Directorate
ESS&H	Environmental, Safety, Security and Health
EBIS	Electron Beam Ion Source
EIC	Electron Ion Collider
EM	DOE Office of Environmental Management
ESAAB	Energy Systems Acquisition Advisory Board
fMRI	Functional Magnetic Resonance Imaging
FACE	Free Air Carbon Dioxide Enrichment
FTE	Full Time Equivalent
GPE	General Plant Equipment
GPP	General Plant Projects
GSA	General Services Administration
G&A	General and Administrative
HEP	Office of High Energy Physics
HEPAP	High Energy Physics Advisory Panel
HFBR	High Flux Beam Reactor
IGPP	Institutional General Plant Projects (funded from overhead)
JPSI	Joint Photon Science Institute
LARP	LHC Accelerator Research Project
LEOSS	Long-Term Environmental Operation, Safety & Security

LHC	Large Hadron Collider
LRP	Long Range Plan
LSST	Large Synoptic Survey Telescope
MII	Maintenance Investment Index
LTRA	Long-Term Remedial Action
MINOS	Main Injector Neutrino Oscillation Search (at Fermi National Accelerator Laboratory)
MOU	Memorandum of Understanding
MPSC	Master Plan Steering Committee
NIH	National Institutes of Health
NPP	Nuclear & Particle Physics Directorate
NP	DOE Office of Nuclear Physics
NPL	National Priorities List
NSAC	Nuclear Science Advisory Committee
NSF	National Science Foundation
NSLS	National Synchrotron Light Source
NSLS-II	The future National Synchrotron Light Source
NSRL	National Space Radiation Laboratory
OE	Operating Expense Funds (Overhead)
OSF	Other Structures and Facilities (Real Property)
P5	Particle Physics Project Prioritization Panel
PET	Positron Emission Tomography
QCD	Quantum Chromodynamics
QCDOC	Quantum Chromodynamics On a Chip
R&D	Research and Development
RPM	Risk Prioritization Method
QGP	Quark-gluon plasma
RHIC	Relativistic Heavy Ion Collider
RPV	Replacement Plant Value
S&T	Science and Technology
SBU	Stony Brook University
SC	Office of Science
SF	Square Feet
SFA	Strategic Focus Area
SLI	Science Laboratory Infrastructure
STEM	Scanning Transmission Electron Microscope
S&M	Surveillance and Maintenance
UV/IR	Ultraviolet/Infrared
WFO	Work for Others

EXECUTIVE SUMMARY

BNL has prepared this Ten-Year Site Plan (TYSP) as required by DOE Order O 430.1B, "Real Property Asset Management (RPAM)", using the format provided by the DOE Office of Science guidance.

BNL's vision is to bring the power of science and technology to bear on compelling questions, with the goal of becoming the best science laboratory in the world in chosen areas. As we move forward, the single most important factor for making our vision a reality is the seamless alignment of exceptional science, outstanding operations, and developing and strengthening relationships with key stakeholders. With this in mind, we have identified key areas that will enable us to assume or maintain a world leadership role, which in essence will support the Laboratory into the future.

Specifically, in the next few years, BNL will concentrate on building the world-class capabilities of NSLS-II and nanoscience at the Center for Functional Nanomaterials and across the Laboratory. We will begin the evolution of RHIC to a QCDLab at RHIC, and we will establish a computational science effort at BNL that will be a vital resource for scientific computing in New York State and the Northeast. We will continue to pursue world-class research at The Center for Translational Neuroimaging. This year, we are laying plans for two new emerging opportunities, energy and advanced detectors, both of which have a foundation in our existing core competencies. We will also maintain a stake in other business lines for which we are nationally and internationally recognized.

In order to accomplish our goal of becoming the premier science laboratory in the world in chosen areas, it will be necessary to address critical infrastructure concerns. Paramount to this objective is implementation of infrastructure renewal, i.e., upgrades and enhancement needed to support the expanding scientific and technological base. In addition, the unique facilities in operation at BNL are dependent upon reliable uninterrupted utility services with sufficient reserve capacities to ensure unrestrained future growth.

Another high priority infrastructure goal is to provide world-class facilities that will allow us to recruit and retain a premier staff. Many of the buildings and laboratories currently used are of 1950's and 1960's vintage. Where upgrades are not possible or cost-effective they must be replaced *in toto*. By providing and maintaining world-class facilities, the Laboratory will continue to be recognized as a leader in those selected fields.

In response to the Laboratory's scientific priorities, infrastructure projects were formulated as described in this TYSP in order to maintain and upgrade mission-essential facilities and to provide new ones, where warranted. Completing these projects will enable BNL to realize its mission and to meet the goals expressed in the "DOE Office of Science Strategic Plan". We expect that they will be funded from the following sources:

- Infrastructure-related line items. Over the ten-year planning period as part of the SC Infrastructure Initiative, BNL has proposed projects that will help to achieve the goals identified as part of its Site Master Plan process. The projects can be categorized as those providing new modern facilities where it is not cost effective to rehabilitate and upgrade existing ones, those which will rehabilitate and upgrade permanent buildings where the functional layout meets current and anticipated program needs, and those

which will modernize utilities to ensure continued high-reliability. The projects are as follows (all costs in at-year dollars):

1. New facilities: BNL has proposed an Interdisciplinary Science Building (ISB) complex consisting of two buildings to be constructed in phases. ISB I with a project start in FY09 has a TEC of $66.3M and ISB II with a proposed project start of FY12 has a TEC of $70M. In addition, BNL has proposed replacing some support shops, located in 65 year-old wood buildings, with a modern facility; construction would begin in FY14 with TEC of $43M. Finally, a major new building addition is proposed to meet emerging multi-program computer needs. It would start in FY17 with a TEC of $27M.
2. Rehabilitation and upgrade of BNL's major lab/office buildings: BNL proposed phasing this work over three projects during the 10-year planning period. The initial phase began in FY07 and has a TEC of $18M; the next two phases are proposed to start in FY10 and FY18 with TECs of $50M and $55M respectively.
3. Utilities Modernization: A utilities improvement project to address electrical, central steam and potable water needs is proposed for a FY15 start and has a TEC of $38M.

- General Plant Projects (either GPP or IGPP) projects will average $8.4M per year (IGPP would be less by the value of the burden imposed on GPP projects). These projects will help meet the immediate needs of BNL's scientific initiatives, and reduce the backlog of non-line item capital construction needs. Several projects will be constructed to support and complement the proposed line items initiatives, such as those that will help to free up preferred building sites for new line item projects, and projects which complement the rehabilitation and upgrade line item projects.

- The deferred maintenance reduction target for FY08 is $7.2M, rising to $10.5M in FY10 and then to $13.7M in FY11 and beyond until deferred maintenance reduction goals are achieved. The overall maintenance budget will remain at 2% of Replacement Plant Values (RPV).

BNL has a deferred maintenance (DM) backlog of $90M, and a rehabilitation and improvement (RIC) backlog of $200M. Furthermore, over $60M of environmental liabilities projects are waiting transfer to the DOE-EM program. In addition, new projects are likely to be identified over the planning period to address emerging scientific needs and address the findings of continued facility condition inspections. To meet the infrastructure challenges, BNL formulated the following strategies to meet the immediate needs of its staff and facility users:

- Construct new state-of-the-art research facilities that facilitate collaboration and support interdisciplinary research teams.
- Maintain quality workplaces for employees and users through rehabilitating, renovating and upgrading those permanent buildings that can readily support current and future missions.
- Continue to defer major investments in 60-year-old wood buildings (mostly used by support staff). Perform minimum maintenance to keep these buildings operational and safe. When opportunities arise, consolidate staff from these old wood structures that need to be demolished because of significant deficiencies.

- Pursue alternative financing for new buildings. BNL will investigate alternative financing for a new support staff office building.
- Use planning teams composed of engineering and site maintenance staff to identify and recommend strategies for maintaining utility system reliability at minimum cost.
- Continue to work with New York State and the New York Power Authority (NYPA) to obtain power at a reasonable cost.
- Continue to develop strategies that will address, in a cost-effective manner, the various energy reduction and sustainable design goals from DOE. These will include:
    1. Operate the utility plants in the most cost-effective manner, taking advantage of fuel storage and fuel switching capabilities.
    2. Increase emphasis on maintenance of energy consuming systems to increase efficiency.
    3. Develop energy conservation projects to reduce energy use and enhance operations. This may include the use of an Energy Savings Performance Contract (ESPC).
- Work with local and state regulators to prioritize environmental liability issues.
- Prioritize all proposed investments in infrastructure and ES&H and program them to maximize the value of BNL's infrastructure, reduce risk, and support the science programs.

B.0 OVERVIEW OF SITE FACILITIES & INFRASTRUCTURE

B.1 LABORATORY OVERVIEW

Thirty percent of Brookhaven National Laboratory's (BNL's) 5,320 acre site is developed (Figure B-1). Many buildings date back to World War II, some earlier. Most major permanent facilities are the DOE-SC facilities built in the 1950s and 1960s, excluding those constructed for the Relativistic Heavy Ion Collider (RHIC). The remainder, wells and treatment facilities supporting the DOE-EM's environmental remediation programs are expected to move from the DOE-Environmental Management (EM) to the DOE-Office of Science (SC) in FY11. BNL's site-wide utilities include electrical-, communications-, steam-, sanitary sewer-, storm sewer-, and potable-water- systems, with limited distribution systems for chilled-water and compressed air. The following tables and figures give an overview of the Laboratory's facilities:

Table B-1 Laboratory Space Distribution, Summary

	SC		EM	
	SF x 1,000	#	SF x 1,000	#
Facility Type				
Total Buildings	3,878	335	175	14
Active Buildings	3,844	327	165	13
Excess Buildings	34	7	10	1
Portable Structures	63	184	8	23
Leased Off-site	0	0	0	0

Table B-2 Replacement Plant Value ($M)

Asset Type	SC	EM
Total Buildings	1,352	53
Active Buildings	1,340	52
Non-operational Excess Buildings	12	1
Total Other Structures & Facilities (OSF)	1,636	153
Active OSF (Non-Programmatic)	358	60
Active OSF Programmatic (3000 Series)	1278	93
Excess Other Structures & Facilities (OSF)	0	0

Figure B-1 Aerial Photo – Brookhaven National Laboratory's Main Site Area

Figure B-2 - Space Distribution, GSA Grouping (Non-Excess)

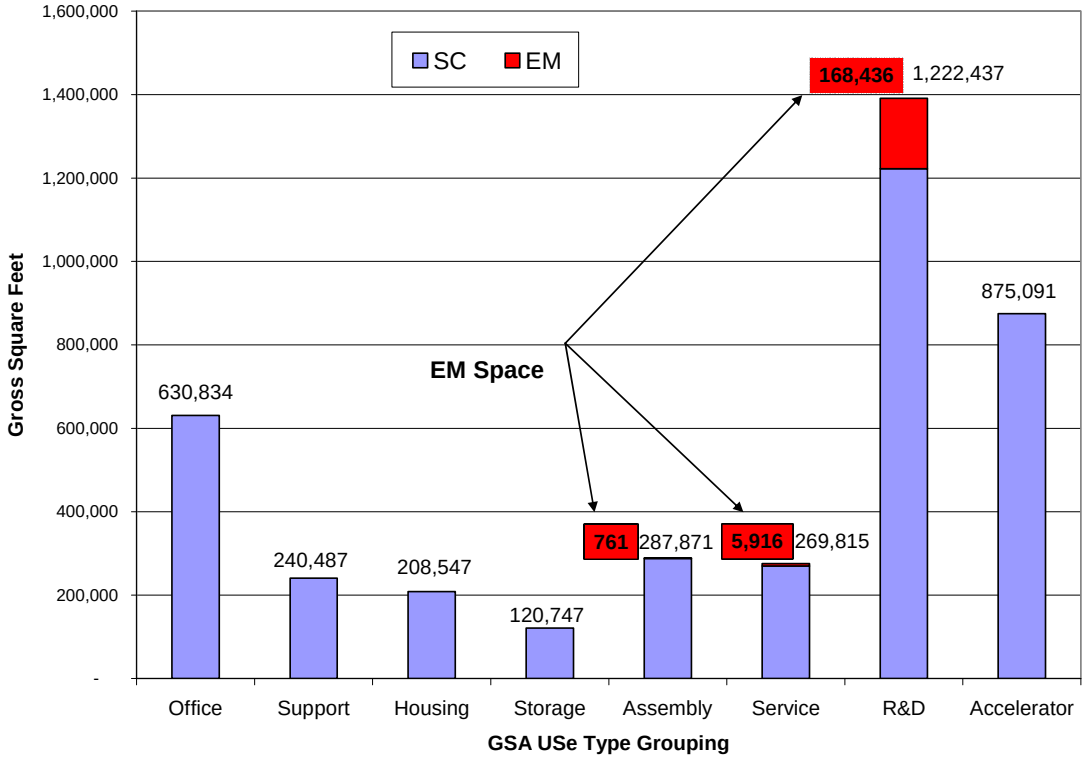


Figure B-3 Distribution of Building Age, years (Non-Excess)

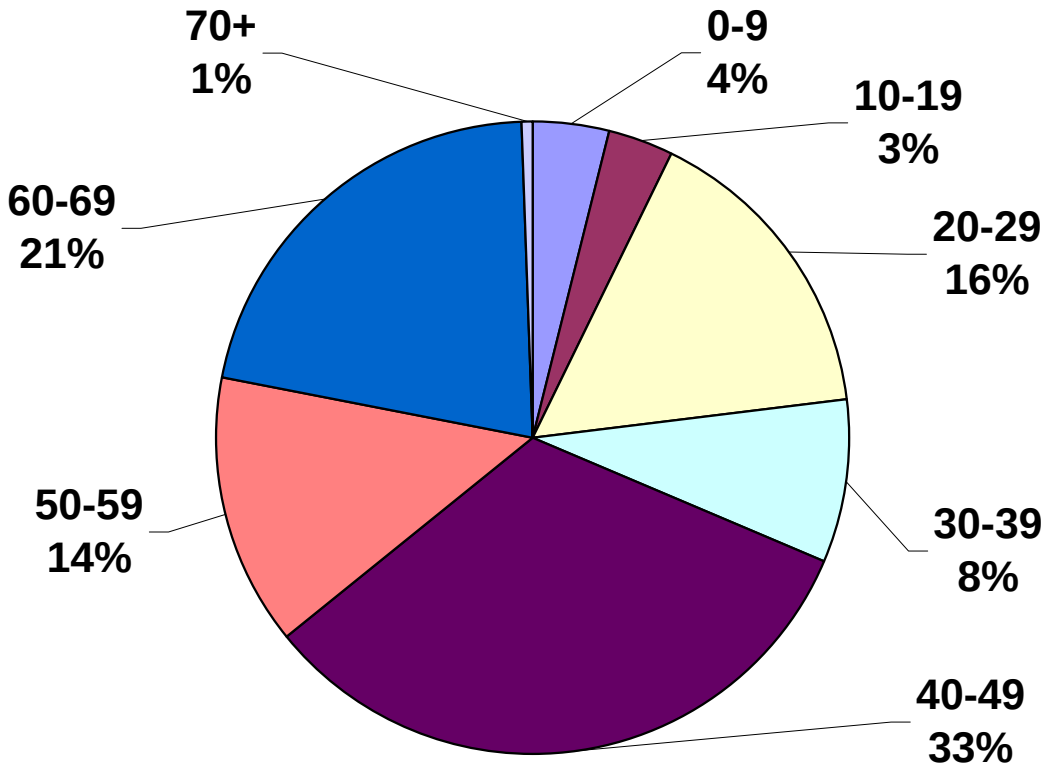


Table B-3 Other Summary Information

	SC	EM
Landlord Program	Nuclear Physics	N/A
Buildings		
Number	335	14
Gross Square Feet (gsf)	3,877,822	175,113
Largest Occupied (in gsf)	256,548 RHIC Tunnel	117,790 HFBR
Wooden Buildings (gsf)	523,836	292
Age of Buildings: Average (Weighted by SF)	44	46
Excess Facilities:		
Radiological - Uncontaminated ((gsf)	8,339	0
Radiological - Contaminated (gsf)	25,307	9,864
Rehab and Improvement Cost (RIC) $k	205,127	60
Buildings	150,597	60
OSF	54,530	0

B.2 SITE / LABORATORY HISTORY

The area of Central Suffolk County now occupied by BNL served as the site of Camp Upton, during World War I. When the war ended, Camp Upton's usefulness was limited. For a time it functioned as a demobilization site for returning veterans, but eventually the Army deactivated it and sold off all its contents. In the 1930s, the Civilian Conservation Corps (CCC) replanted trees and vegetation, dug wells and constructed many firebreaks in an effort to establish the site as Upton National Forest. During World War II the Army rebuilt the site as an induction center. When the war ended, Camp Upton became a hospital and a rest and recuperation facility. In 1947, the site was transferred to the Atomic Energy Commission, and BNL was born.

In converting the site to a national research center, barracks were designated for use as temporary facilities until permanent structures could be constructed for scientists and their equipment. When BNL opened, it was one of three National Laboratories; places where federally funded facilities could be built that were beyond the resources of individual universities. In the late 1940s, this meant constructing nuclear reactors and particle accelerators, although then, universities still could afford to build forefront accelerators.

Brookhaven's first generation of these two types of machines was completed in the early 1950s. The Brookhaven Graphite Research Reactor (BGRR) operated from 1950 to 1968, and the Cosmotron, a proton synchrotron that was the first particle accelerator to surpass 1 billion electron volts (GeV) was dedicated in 1952. The completion of each machine significantly impacted the growth of the Laboratory because supporting facilities and experimental equipment had to be built, along with special arrangements made for power, security, waste disposal, and so forth. A hot lab, built in 1951, to handle nuclear engineering and chemistry, and a medical research reactor, completed in 1958, were part of a new medical research facility. Two major, low-power accelerators also served Brookhaven low-energy nuclear physics and irradiation programs: a 3.5 million electron volts (MeV) Van de Graaff accelerator, still operational, and a 60-inch cyclotron, which operated until 2003. Both originally were built for industry, and were deemed suitable for use at BNL after Brookhaven scientists undertook major renovations to tailor them for research.

In the 1960s, BNL finished constructing a second generation of large machines. The Alternating Gradient Synchrotron (AGS), a 33 GeV proton accelerator, was ready in 1960, and the High Flux Beam Reactor (HFBR), a research reactor generating thermal neutrons, which operated from 1965 to 1996. Again, the new large facilities entailed restructuring the BNL site in terms of support, organization, and power. The Brookhaven Linac Isotope Producer (BLIP) was attached to the end of the linear accelerator leading into the AGS, allowing medically useful radionuclides to be produced without interfering with the AGS work. Another major research facility built during the 1960s was the Tandem Van de Graaff, completed in 1970, that for many years was the world's largest electrostatic accelerator. Aside from the BGRR and HFBR, these machines have been continually upgraded and are still in operation.

At the end of the 1960s, Brookhaven underwent a period of major budgetary constriction, losing a sizable fraction of its employees. A large nuclear engineering program, oriented towards developing a liquid metal fuel reactor, was terminated. During 1966 and 1967, the Laboratory acquired from Suffolk County and private land owners approximately 960 acres adjacent to its eastern boundary, 200 acres adjacent its northern boundary, and 750 acres adjacent to its southern boundary. In 1971, the North Tract of approximately 2,250 acres

located on the north side of Route 25, was declared surplus Federal property and was transferred to New York State to use as parkland except for a 45 acre parcel acquired by the Shoreham-Wading River School District. Brookhaven pursued the possibility of having a third-generation accelerator from the 1960s onwards. By the mid-1970s, it seemed as though one would be built -- ISABELLE, a colliding-beam accelerator. A tunnel was completed early in the next decade, but the project was terminated before the accelerator could be constructed.

The late 1970s marked the development of a major new user facility at BNL, the National Synchrotron Light Source (NSLS) designed to exploit the use of synchrotron light as a research tool to study matter. Ground was broken in September 1978, and, in 1982, commissioning began on the Vacuum Ultraviolet (VUV) and x-ray storage rings. The NSLS received immediate, enthusiastic support from its user community, which included many major industrial firms, and in 1983, approval was received for expanding the NSLS building and adding several experimental beamlines. Today, the NSLS supports on average 2,400 users/year from 400 university-, industrial-, and government-institutions on over 60 experimental beamlines.

In the 1980s, the development of heavy ion capability began at the AGS, with the construction of a transfer tunnel connecting the Tandem Van de Graaff accelerators to the AGS and an AGS Booster facility. In addition, the National Synchrotron Light Source was significantly expanded adding needed laboratory and office space.

In 1991, the Laboratory received approval for the Relativistic Heavy Ion Collider (RHIC). This world-class nuclear physics accelerator builds upon the heavy ion capability developed at the AGS and uses the facilities constructed a decade earlier for the ISABELLE project. RHIC started operations during the summer of 2000.

In November 2000, the DOE designated 530 acres of BNL property as the Upton Ecological and Research Reserve to protect the Pine Barrens and foster ecological research. The new Research Support Building became operational in 2007. The Center for Functional Nanomaterials whose construction began in late 2005 is expected to be fully operational 2008. Conceptual design of the National Synchrotron Light Source II was completed in 2007 with operation expected during 2014.

B.3 TOPOGRAPHY AND HYDRO-GEOLOGY

BNL is situated on the western rim of the shallow Peconic River watershed. The marshy areas in the site's northern and eastern sections are part of the Peconic River headwaters. Depending on the height of the water table relative to the base of the riverbed, the Peconic River both recharges to, and receives water from the groundwater system. During sustained droughts, the river water typically recharges to the groundwater; with normal to above-normal precipitation, the river receives water from the aquifer.

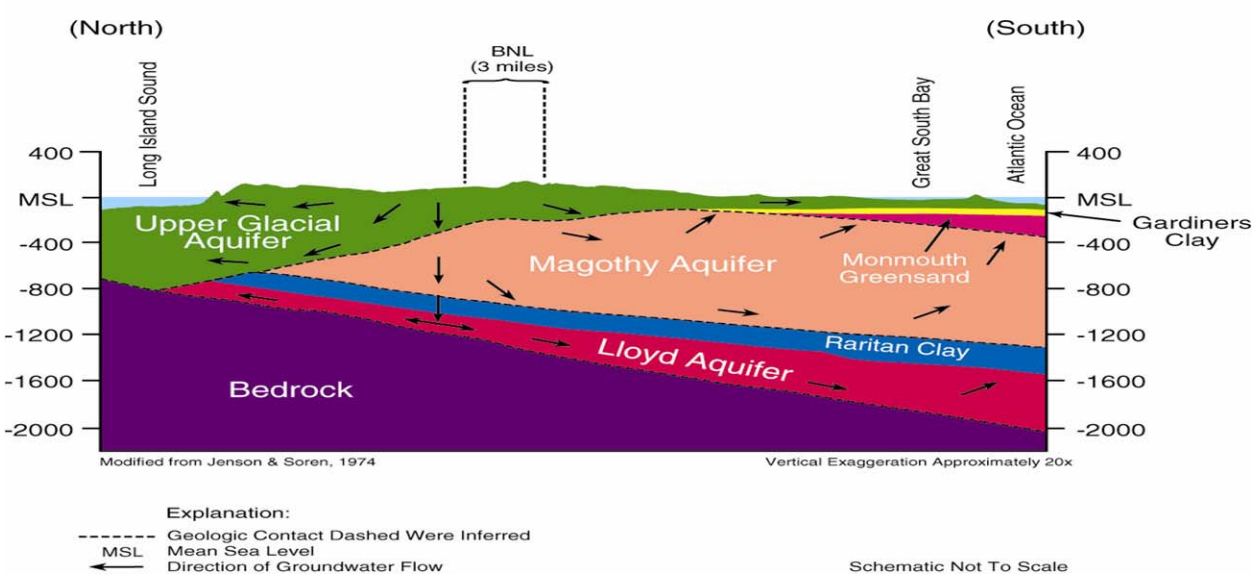
In general, the terrain of the BNL site is gently rolling, with elevations varying between 44- and 120-feet above mean sea level. The depth to groundwater from the surface of the land ranges from 5 feet near the Peconic River to about 80 feet in the higher elevations of the site's central and western portions. Studies of Long Island's hydrology and geology near the Laboratory indicate that the uppermost Pleistocene deposits, composed of highly permeable glacial sands and gravel, are between 120- and 250-feet thick. Water penetrates these

deposits readily and there is little direct runoff into surface streams unless precipitation is intense. These sandy deposits, referred to as the Upper Glacial aquifer, store large quantities of water (Figure B-4). On average, about half of the annual precipitation is lost to the atmosphere through evapotranspiration while the other half percolates through the soil to recharge the groundwater. The area has a high average recharge rate (22 inches per year) that varies seasonally.

The Long Island Regional Planning Board and Suffolk County identified the BNL site as overlying a deep-flow recharge zone for Long Island groundwater. Precipitation and surface water that recharge within this zone can replenish the Magothy and Lloyd aquifer systems lying below the Upper Glacial aquifer. Experts estimate that up to two-fifths of the recharge from rainfall moves into the deeper aquifers. The extent to which groundwater at the BNL site contributes to deep flow recharge was confirmed using an extensive network of shallow and deep wells installed at BNL and surrounding areas.

This groundwater system is the primary source of drinking water for both on- and off-site private and public supply wells and, hence was designated by the EPA as a sole source aquifer system. BNL uses approximately 1.8 million gallons of groundwater daily to meet potable water needs and heating and cooling requirements. Approximately 60 percent of the water pumped from BNL's supply wells is returned to the aquifer through on-site recharge basins: about 22 percent is discharged into the Peconic River. Human consumption, evaporation (cooling tower and wind losses), and losses in the sewer lines account for the remaining 18 percent. An additional 3.6 million gallons of groundwater are pumped each day from remediation wells for treatment and then returned to the aquifer.

Figure B-4 Generalized Geologic Cross Section in Vicinity of BNL



C.0 CURRENT AND FUTURE MISSIONS FOR THE SITE

C.1 MISSION

Since its founding in 1947 by the distinguished research universities of the Northeast, the Laboratory's primary mission has been to deliver science-based solutions to the Nation's needs in the physical, basic energy, and biomedical sciences. BNL is also recognized for expertise in energy technologies, environmental sciences, and national security. The Laboratory is especially noted for the design, construction, and operation of large-scale, cutting edge research facilities that support thousands of scientists world-wide, and for its fundamental research into the nature of nuclear matter, materials, bio-medical and climate sciences.

C.2 VISION FOR THE LABORATORY

As a multidisciplinary laboratory that is funded primarily by the Office of Science of the U.S. Department of Energy, BNL asks compelling questions in areas that range from basic science to science underlying technologies that address issues of national concern. Based on the core competencies developed during its celebrated sixty year history, BNL envisions:

- Being the world-leading laboratory for high-energy nuclear and spin physics research to understand the essence of nuclear matter
- Becoming a world leader in the fabrication and characterization of materials and systems at the nanoscale for energy technology applications
- Using translational biomedical imaging to understand and treat addiction and other disorders
- Becoming known as a vital resource in computational science for New York State and the Northeast.

In pursuing answers, BNL will work in cross-disciplinary teams in collaboration with other National Laboratories, universities, and industry. We will also participate in training the next generation of scientists in partnership with universities.

C.3 MAJOR BUSINESS LINES

As presented in the DOE "*Business Plan for the Office of Science's Brookhaven National Laboratory"*, BNL has three major scientific business lines, which in the order of current investment are nuclear physics, basic energy sciences, and bio-medical sciences. They align with the missions of the Office of Nuclear Physics (NP), the Office of Basic Energy Sciences (BES), and the Office of Biological and Environmental Research (BER). At a higher level, they fall under the Strategic Themes of Energy Security and Scientific Discovery and Innovation which are two of the cornerstones of the *U.S. Department of Energy Strategic Plan*.

C.3.1 Nuclear Physics (NP)

BNL has a preeminent role in searching for and characterizing the quark gluon plasma and in understanding the structure of the nucleon, which are two of the goals for Nuclear

Science articulated in the *Office of Science Strategic Plan: Explore Nuclear Matter-from Quarks to Stars.* The enabling tool for this research is the Relativistic Heavy Ion Collider (RHIC), BNL's premier nuclear physics accelerator complex, which has the capability of colliding beams of symmetric or asymmetric nuclei, as well as polarized protons. BNL is the world leader in experiments exploring quantum chromodynamics (QCD) and in spin physics and a world leader in the theory effort related to these topics. Evolving the RHIC complex to the QCDLab at RHIC will assure its world leadership role is maintained.

C.3.2 Basic Energy Sciences (BES)

BNL offers a new approach to address the energy security challenges facing the U.S. by determining: (from the Office of Science *Strategic Plan: Advance the Basic Sciences for Energy Independence*) the new, useful properties materials display in moving from the macroscopic to the nanoscale; how to efficiently assemble molecular-scale structures; how to master the control of energy-relevant systems that exhibit collective, cooperative, and/or adaptive behaviors". These are precisely the strategies set forth by BES, which are to carry out world-class research in grand challenge areas that impact the DOE energy mission.

BNL's programs in strongly correlated systems and in fuel cell nanoparticle synthesis and reactivity are considered to be among the best in the world. Since the discovery of high Tc superconductors and the inception of our strongly correlated electron program in 1987, BNL scientists have published a large number of highly-cited papers in this area; our fuel cell electrocatalysis program was cited in *Science* as an example of basic research funded by the Office of Science that strives to build cheaper fuel cells to produce hydrogen.

Future enhancements associated with the NSLS-II (the future National Synchrotron Light Source), NSLS, the Center for Functional Nanomaterials (CFN), and theory will ensure the prominence of BNL's program in catalysis science. Novel x-ray and UV/IR techniques at NSLS will take on a unique role at NSLS-II, which will provide the world's finest tools for x-ray imaging and spectroscopy with capabilities at the nanoscale.

C.3.3 Bio-medical Sciences (BER/NIH)

BNL has an important part in mastering the convergence of the physical and the life sciences, with the ultimate goal of delivering revolutionary technologies for health and medical applications (from the Office of Science Strategic Plan *Harness the Power of Our Living World*). Besides our leadership role in exploring how the brain develops, changes, and adapts to the environment over a life time (through the combination of expertise in radiotracer chemistry, imaging physics, and preclinical and clinical neuroscience), BNL is a center for structural biology, having complementary expertise in elucidation of macromolecular structure by crystallography, scanning transmission electron microscopy, and cryo-electron microscopy.

BNL's Center for Translational Neuroimaging (CTN) is a world leader in radiotracer development and the use of innovative technological approaches in Positron Emission Tomography (PET) and functional Magnetic Resonance Imaging (fMRI) for imaging the human and animal brain. BNL is the best in the world in studying the impact of addiction on the brain. The facilities for determination of macromolecular structure at the NSLS and in the Biology Department continue to attract world-class scientists, both as BNL staff and as facility users. Research on ion channel proteins, conducted at the NSLS, garnered the 2003 Nobel Prize in Chemistry.

C.3.4 Secondary Business Lines

BNL has a stake in other scientific business lines (also in the order of current investment) for which it is nationally and internationally recognized:

C.3.4.1 High Energy Physics (HEP)

BNL has a distinguished history in high energy physics, having received five Nobel Prizes for discoveries that point to physics beyond the standard model. BNL continues to search for possible physics beyond the Standard Model (from the Office of Science Strategic Plan: *Explore the Fundamental Interactions of Energy, Matter, Time, and Space*) with the goal of extending it to an all-inclusive theory.

Among its high priority efforts, BNL serves as the host laboratory for U.S. participation in the LHC ATLAS experiment at CERN that will manage the U.S. roles in physics research, computing, and future upgrades. BNL hosts a Tier I Computing Facility and Analysis Support Center for ATLAS data and manages the LHC Accelerator Research Project (LARP) for the LHC luminosity upgrade. Other areas involving BNL scientists are high energy theory, MINOS, D0, and advanced accelerator R&D. We also have roles in LSST and a neutrino experiment at Daya Bay in China. BNL is home to the Accelerator Test Facility (ATF), the first user facility for advanced accelerator research.

C.3.4.2 Climate Change Science (BER)

BNL has significant capabilities in aerosol research, whose goal is to improve climate models and increase our ability to distinguish between natural and anthropogenic climate change (from the Office of Science Strategic Plan *Harness the Power of Our Living World*).

BNL is a U.S. leader in atmospheric chemistry, particularly studies related to the creation and evolution of aerosols, and their role in the global radiation balance. The Chief Scientists for the DOE Atmospheric Science and Atmospheric Radiation Measurement Programs and the ARM Mobile Facility Scientist reside at BNL. In addition, BNL operates the ARM External Data Center and the Free Air Carbon Dioxide Enrichment (FACE) Facility in the Duke Forest.

C.4 MAJOR ACTIVITIES/INITIATIVES

From the goals that we have articulated in our *Fiscal Year 2007 Strategic* and *Annual Laboratory Plans*, BNL's major activities/initiatives at the Laboratory level are:

- NSLS-II
- RHIC→QCDLab at RHIC
- Nanoscience
- Scientific Computing

These are marquee projects that build on current strengths and that will ensure the long term vitality of our business lines.

Using this definition, we now consider our plan for Translational Biomedical Imaging, to be a Directorate level initiative. In other words, although it will require institutional resources and attention for success, its scale does not rise to the level for defining the future of the Laboratory. BNL envisages Energy and Advanced Radiation Detectors as two Emerging Opportunities, for which business cases are being developed.

In light of the Office of Science FY 2008 Budget request, which marks the second year of the President's commitment to double federal investment in basic research in the physical sciences as part of the American Competitiveness Initiative and which also supports basic research that contributes to the President's Hydrogen Fuel and Advanced Energy Initiatives, we are optimistic that BNL will grow over the next ten years. Such growth will necessitate infrastructure revitalization. However, the need to build, modernize and maintain facilities and infrastructure to achieve mission goals and ensure a safe and secure workplace is not unique to BNL, but one that persists across the DOE complex. For that reason, it was called out as a goal in the *Department of Energy Strategic Plan* to address DOE's real property assets. Thus, the following sections describe the programmatic strategic themes, as well as the impact of infrastructure on the BNL campus.

C.4.1 Major Initiative: NSLS-II

The NSLS has served a large community of researchers and users for more than 20 years. However, its capabilities are restricted because the brightness has reached its theoretical limit after many stages of improvement and the number of insertion devices that can be added is limited. These factors will increasingly limit the scientific productivity and impact of its large user community. (However, it is noteworthy that in 2006, the NSLS produced a *record* number of publications with ~25% of them in premier journals.)

In order for the discovery potential of the NSLS to continue beyond the next decade, BNL plans to upgrade its capability by constructing the world's best synchrotron light source, NSLS-II, a 3rd generation storage ring, together with advanced insertion devices, optics, detectors, and a suite of scientific instruments. NSLS-II will deliver the world's highest brightness and flux, an increase over those of the current NSLS by more than 10,000 times and 10 times, respectively and unprecedented stability. Its advanced optics will produce spatial resolution of 1 nm and energy resolution of 0.1 meV.

The superlative character and combination of capabilities will have broad impact on a wide range of disciplines and scientific initiatives in the coming decades, including new studies of small crystals in structural biology, a wide range of nanometer-resolution probes for nanoscience, coherent imaging of the structure and dynamics of disordered materials, greatly increased applicability of inelastic x-ray scattering, and properties of materials under extreme conditions.

Ultimately, NSLS-II will benefit DOE and the taxpayer by advancing nanoscale science that will lead to improved energy technologies. It will provide the Nation's science community access to a world leading research facility, and U.S. industry a competitive advantage for new materials and technologies beyond silicon. The ESAAB review for CD-1 was conducted during the third quarter of FY 07 and we anticipate the CD-2 review during the first quarter of FY 08.

With receipt of CD-1 for NSLS-II expected shortly, plans to build the Joint Photon Science Center (JPSI) with $30M in funds provided by the Empire State Development Corp. are

underway. A draft DOE mission need statement for JPSI, a concept for its organizational structure, a scientific advisory committee, etc. are being developed. JPSI will serve as an intellectual center for development and application of photon sciences, as a gateway for users of NSLS and NSLS-II, and as a facility to educate and train the next generation of leaders in synchrotron research. The JPSI building, expected to begin full operations in FY 2012, will offer office space, meeting areas, and laboratories in an interdisciplinary R&D center. In addition, because we anticipate the user community to grow and eventually exceed 2,500, there are on-going discussions with local government authorities on their funding a dormitory near NSLS-II for visiting researchers.

As BNL transitions from NSLS to NSLS-II, the core operations of NSLS will continue and management will continue to work with users to assure cutting edge operations until NSLS-II is operational. The NSLS programs will be moved to NSLS-II and during the period when programs are transferring, both machines will be operated. NSLS operations staff will transfer to NSLS-II. A plan is being developed to renovate the NSLS building for use as an office building for NSLS-II staff.

Summary analysis of the impact of NSLS-II and JPSI on the site are provided in Tables C-1 and C-2.

Table C-1 Impact of NSLS-II on the Site

Building Area (storage ring)	382,000 SF increase for storage ring (other utility buildings may be added depending on final utility design).
Is offsetting space available, or is a waiver is required?	Received a waiver which included space offset from two other DOE facilities. This waiver also includes space for other future BNL projects, RHIC, and various GPP projects.
Will project demolish existing space?	At this time, it is unlikely that the project will demolish existing space. A portion of the NSLS will be reused for NSLS-II administrative and support staff.
Facility completion date and reported to FIMS	2014
Expected RPV	Conventional facilities will be in the range of $220-$308M (not including experimental equipment value). Current NSLS operating budget is ~$34M, for NSLS II it is expected to be ~$140M. Unclear what fraction of that ~$106M difference will go to site maintenance funding
Staffing increase	About 300 additional staff over existing NSLS level
Need for more office space, etc.	None beyond that included in the project; existing cafeteria & shops are OK
Increase in utility capacity	CCWF capacity needs to be increased by 2,400 tons to provide firm capacity
Traffic and parking needs	Part of the project.

Table C-2 Impact of JPSI on the Site

Building Area (JPSI)	45,000-50,000 (contingent on NSLS-II CD-1 approval from DOE; funded by NYS)
Is offsetting space available, or is a waiver is required?	Not DOE-funded; therefore does not apply
Will project demolish existing space?	No
Facility completion date and reported to FIMS	Building occupancy by mid 2011
Expected RPV	$30M
Staffing increase	Minor, mostly for users. NSLS II staff included in NSLS II totals
Need for more office space, etc.	Provides lab and office space
Increase in utility capacity	Minor impact; no system-wide increase
Traffic and parking needs	Part of the project

C.4.2 Major Initiative: RHIC→QCDLab at RHIC

The discoveries at RHIC have led to compelling questions about QCD and vice versa. Compelling questions have in turn prompted the need for evolution of the facility to further the study of QCD experimentally and theoretically. The expectation is that the evolution of RHIC to the QCDLab at RHIC will play a major role in determining the nature of the quark-gluon plasma and the visible universe, the origin of the spin of the proton, and the role of the color glass condensate (CGC) in the structure and interaction of high energy hadrons. This will require a staged approach over a number of years. It will entail luminosity, polarization, and experimental equipment upgrades, construction of an electron ring and an associated new detector for eRHIC (the world's first electron-heavy ion and polarized electron-proton collider, e+A/e+p), and high-end computing capability (QCDOC and Blue Gene) for next-generation lattice QCD simulations.

RHIC has already had a tremendous impact in nuclear physics, science, and society, with over 90 *Physical Review Letters* published, >7,000 citations, and 29 of the 50 most cited *nucl-ex* papers of all time. The science of RHIC is taught in physics courses, and has been captured in the popular science press. Furthermore, RHIC is an outstanding educator of nuclear physicists. The RHIC experiments produce ~30 Ph.D. students per year, with more to come. QCDLab at RHIC will train the next generation of scientists.

At DOE's recommendation, BNL prepared a *Mid-Term Strategic Plan for RHIC*, which lays out the path forward for the period 2006-2011, and implicitly beyond. The mid-term phase leads directly into operation of the collider at high luminosity with e-cooling (first of a kind). The strategy is based on upgrading the capabilities of the PHENIX and STAR detectors and providing computing resources to the RHIC Computing Facility. An important consequence of this plan is that the RHIC-II project is more narrowly defined as a luminosity upgrade under this scenario, as the two large detectors will have been equipped to pursue the compelling science enabled by higher luminosity.

The mid-term will also see improvements to the aging infrastructure at the RHIC/AGS complex, and the construction of EBIS, the new injector to RHIC that will replace the 35-year old Tandem Van de Graaff accelerators. An overview of the planned upgrades is summarized at http://www.bnl.gov/rhic/news/042407/story1.asp. Since EBIS (a joint

DOE/NASA project) involves a building addition, a summary analysis of its impact on the site is provided in Table C-3.

Table C-3 Impact of EBIS on the Site

Building Area	EBIS will be located in Bldg. 930. A two story, 2400 square foot addition to Bldg. 930 will house support equipment.
Is offsetting space available, or is a waiver is required?	Have received a waiver which included space offset from two other DOE facilities. This waiver also includes space for other future BNL projects, RHIC, and various GPP projects.
Will project demolish existing space?	A two floor stairway of 400 sf will be demolished
Facility completion date and reported to FIMS	Assumed to be at project closeout, Fall 2008 (Building only)
Expected RPV	Expected RPV of the conventional facilities and resulting increase in site maintenance funding: the TEC is $1.15k with a construction cost of ~$950k.
Staffing increase	None
Need for more office space, etc.	No need
Increase in utility capacity	None
Traffic and parking needs	None

Recently, our plan to build RHIC II was endorsed by NSAC as the fourth outcome of the 2006-2007 Long Range Planning exercise (still in draft form). NSAC recommended implementation of the RHIC II luminosity upgrade, together with detector improvements. In an unnumbered fifth “bullet”, it recommended the allocation of resources to develop accelerator and detector technology necessary to lay the foundation for a polarized Electron Ion Collider (EIC) (the generic term for eRHIC). The EIC would explore the new QCD frontier of strong color fields in nuclei and precisely image the gluons in the proton.

C.4.3 Major Initiative: Nanoscience

Nanoscience offers a new approach to address the energy security challenges facing the U.S. through the development of materials exhibiting novel and unprecedented functionality for energy manipulation and utilization. BNL’s premier facility for nanoscience research is the CFN, whose mission is to develop and share materials, processes and tools at the nanoscale with an emphasis on energy. It is a user-oriented facility for the preparation, characterization, understanding, and development of new techniques. The scientific themes of the CFN are nanostructured catalysts, electronic nanomaterials, and bio/soft nanomaterials and interfaces.

Nanoscience is an emerging field. BNL will forge leadership programs in energy, hence making its activities unique. A clear advantage of the CFN is its proximity to the NSLS (and in the future to NSLS-II) and existing programs that are related to the scientific themes of the CFN.

The potential benefit of BNL's nanoscience program to DOE and the taxpayer is breakthrough science leading to revolutionary technologies that address national challenges in energy security, consistent with the Department of Energy mission. It will enable open access to world-leading integrated science programs and facilities, and with the other Nanoscience Research Centers, maintain U.S. competitiveness in nanoscience.

The CFN building has ample laboratory and office space for the CFN hires. Its impact on the site is shown in Table C-4. However, the condition of existing laboratory space for the core programs and future hires in those programs is a concern. Many experimental laboratories are 40-50 years old. Although BNL's 3PBP program has provided some relief on a smaller scale, in FY07, BNL will start the Renovate Science Lab Phase I project to ameliorate the situation, with construction in FY 08 and 09, finishing in FY 10. The project will renovate whole wings of permanent science buildings.

Table C-4 Impact of the CFN on the Site

Building Area	94,500
Is offsetting space available, or is a waiver is required?	Offsetting space from BNL's space bank is available.
Will project demolish existing space?	Building that housed Teacher's Federal Credit Union was demolished.
Facility completion date and reported to FIMS	CD-4a received April 2007; CD-4b April 2008
Expected RPV	$42M (Conventional facilities portion)
Staffing increase	~40-50 facility staff
Need for more office space, etc.	None beyond that which is included in the project; existing cafeteria & shops are OK
Increase in utility capacity	None needed
Traffic and parking needs	Part of the project

C.4.4 Major Initiative: Computational Science

One of the essential elements in our vision to grow the Laboratory is to become a leader in computational science in New York State and the Northeast. BNL is home to two 10 Teraflop Quantum Chromodynamics on a Chip (QCDOC) supercomputers and large scale computing farms, i.e., the RHIC Computing Facility and the U.S. ATLAS Tier I Computing Center, which provide vital computing capacity for complex data analysis. In addition, Stony Brook University and the Laboratory recently dedicated a 100 Teraflop IBM BlueGene supercomputer located at the Lab. Called "New York Blue", it ranks number five among the world's 500 top fastest computers. We expect New York Blue will give us the leading-edge computing power we need to make crucial computations in physics, biology, medicine, materials science, nanoscience, and renewable energy.

With SBU, we have created a regional user center at BNL (the New York Center for Computational Science), where approximately 40% of the users will be from New York, 20% from DOE, and the balance from other institutions in the region. We foresee hiring a champion to oversee the effort and committing discretionary funds to build the scientific program. We have already have benefited by our relationship with and strong support from SBU, as well as other the Northeast Universities and industry. Gaining support of

stakeholders and establishing new partnerships will be critical to realize the potential benefits of this initiative.

Because the supercomputer is co-located in the space that the ATLAS, RHIC, and QCDOC computers occupy, its infrastructure needs are intimately tied to the building upgrades for ATLAS and RHIC computing, which have been described in the *Mid-term Strategic Plan for RHIC* as a "serious issue". To accommodate future computational expansion (floor space and accompanying power, air conditioning, fire detection/suppression, etc.) we will use GPP/IGPP (and program funds). Optimally new space is needed to address the long range needs in an efficient manner. BNL has proposed a central computing building for funding by the SLI in the far-term.

C.4.5 Directorate Initiative: Translational Biomedical Imaging

The scope of this initiative is to evolve the capability of the Center for Translational Neuroimaging (CTN) in its studies of the function and response of the human brain to a variety of factors including addiction, aging, etc., and translate findings to clinical use. To accomplish this, BNL will develop collaborations with neighboring research hospitals, forefront PET and fMRI capabilities for animal and human studies, and new tools based on core strengths in the physical sciences. The Laboratory entered into an agreement with Mount Sinai School of Medicine that will provide BNL access to a broad base of research patients to facilitate improvements in the understanding, diagnosis, and treatment of disease and to enable us to jointly compete for NIH funds. We are also working on agreements with several other nearby medical institutions to enhance translational capabilities.

Although one of the explicit goals in the DOE Office of Science Strategic Plan 2004 is to "...fundamentally alter the future of medical care and human health...", the current position of the Office of Management and Budget (OMB) is that aspects of the animal and human PET imaging programs are inconsistent with the DOE mission. As a result, the source of future funding for these programs has become a national concern. A panel convened by the National Academy of Sciences is set to release its recommendations in July 2007 on the state of the science in nuclear medicine. Since BNL's imaging infrastructure is currently supported by the Office of Biological and Environmental Research (BER), loss of DOE funds would be a major blow to BNL's world-recognized program in this area. Consequently, research in technical development of imaging capability is a logical path to pursue. Only at an institution, such as BNL whose imaging program has grown from the combination of research in radiotracers, advances in physics and instrumentation, and clinical and preclinical neuroscience, is this possible.

The CTN was formed to integrate the imaging groups in the Medical and Chemistry Departments. Administrative consolidation of the CTN into the Medical Department became effective in 2006, although physically relocating the Chemistry group is not planned at this time. This initiative does not require construction. Thus, the impact to the site is minimal.

C.4.6 Emerging Opportunity: Energy

DOE's overarching mission is "to advance the national, economic, and energy security of the U.S." with the goal of "protecting our national and economic security by promoting a diverse supply and delivery of reliable, affordable and environmentally sound energy." Using its portfolio in energy R&D, DOE will accomplish this by placing an increased emphasis on

integrating basic energy science research with energy technology development. President Bush elevated energy to the national consciousness in February, 2006 when he launched the Advanced Energy Initiative that outlines an aggressive plan to help the U.S. move beyond our dependence on fossil fuels through expanded development of alternative energy sources. Although impacted by the continuing resolution, the 2007 Presidential Budget called for the doubling of funding for research in the physical sciences over the next ten years. Likewise, the Presidential 2008 Budget for the Advanced Energy Initiative includes critical basic research to overcome major energy-related technical barriers.

BNL aspires "to be a world-recognized laboratory in energy R&D that is leading the development of advanced materials and processes for energy applications". Our strategy is to carry out basic and applied research that enables breakthroughs in the effective use of renewable energy through improved conversion, transmission, and storage. In doing so, we aim to increase connections among BNL directorates in joint projects that build on nanoscience, core, newly-funded and planned programs with the potential to contribute to finding solutions to unmet challenges.

The four areas where we will concentrate at the Laboratory level are catalysis, complex materials, solar energy, and biologically-derived fuels, of which the first three have direct connections to nanoscience efforts. Nuclear energy is a crucial Directorate-level initiative. The tools at our disposal are the coordinated CFN facilities, NSLS and NSLS-II, modeling/analysis capabilities, and the energy efficiency test laboratories. Besides inter-directorate connections, a critical element to success is developing and nurturing regional and national partnerships in energy with deeper connections to universities, other national laboratories, and industry. We have strengthened our position by our leadership in the BES Basic Needs Workshops and by participation in the Laboratory Working Group. As a result, we will be poised to take advantage of DOE's American Competitive Initiative that will fund areas of science most likely to contribute to long term economic competitiveness.

Over the last year, working groups completed competitive posture analyses for each of the five energy sub-areas and produced "white papers" describing the factors critical for success of each. These serve as the basis for BNL's energy strategy. In addition to internal and external collaboration, the Laboratory intends to grow energy-related R&D by investing discretionary funds in this area and by continuing to encourage staff to respond to the BES solicitations.

In the energy-related R&D arena, BNL brings core competencies in complex materials, catalysis, combustion science, systems biology, and nanoscience that are anchored by BNL's world class synchrotron and nanoscience user facilities. However, scientists in these programs are dispersed across the site in World War-II era buildings. The availability of state-of-the-art laboratory space that can bring together these staff and subsequently allow us to eliminate the aging buildings in which they are housed is essential. The Interdisciplinary Science Building for energy-related R&D proposed for SLI funding would accomplish this.

C4.7 Emerging Opportunity: Advanced Detectors

BNL will apply its expertise in materials, modeling, detector design, low-noise integrated circuits and instrumentation to develop new classes of x-ray, gamma and neutron detectors capable of high-resolution spectroscopy and imaging. The detectors will be used for national and homeland security, medical, synchrotron, and space science applications.

It is likely that our approach will be two-pronged: a long-term effort that relies on the development of improved materials for radiation sensing and a parallel, shorter-term effort that emphasizes integration of the best detectors available today with appropriate signal-processing electronics into prototypical instrumentation.

Beam lines at the NSLS will be used for device characterization/development. Other facilities across the Laboratory, including the CFN will support synthesis and crystal growth capabilities. Improved low-noise integrated circuits capable of reading the signals from multi-channel pixel devices will be developed by the Instrumentation Division and packaged into complex systems in collaboration with EENS and NPP. The NSRL will be used to understand the effects of radiation exposure and damage to the detectors.

Field-portable systems utilizing high-efficiency devices will be developed to extend the stand-off distance for detection of smuggled radioactive materials and to provide spectroscopic capability for high-fidelity isotope identification of radiation within shipping containers. Solid-state x-ray detectors will be fabricated into arrays to provide greater sensitivity and enhanced spatial information for use at the NSLS. Digital x-ray and gamma imaging systems for early detection of tumors and diagnosis of heart disease will be developed for nuclear medicine applications.

Much of the aforementioned research will be carried out by EENS staff, in collaboration with Instrumentation. However, detector development is crucially important for the success of NSLS-II. Since most of the NSLS-II experiments will be detector limited, a plan for detector design needs to be integrated into the NSLS-II scientific programs. Consequently, the NSLS has initiated a small, but growing effort in this area. As is currently envisioned, this is one of the technologies that JPSI will enable in support of NSLS-II programs.

It is clear that this emerging opportunity will require extensive collaboration and coordination within the Laboratory and with the private sector, in order to spawn commercialization opportunities. At this time, our plan for advanced detectors is still unfolding, so its impact on Laboratory infrastructure (other than at JPSI) is uncertain.

C.5 SUMMARY

With full CFN operations starting in FY08, FY 07 funds from DOE for EBIS construction allocated, the BNL/SBU BlueGene computer installed, DOE's CD-1 for NSLS-II anticipated shortly, and NSAC endorsement of RHIC II, the future for BNL looks bright. Table C-5 shows the projected Laboratory growth in funding and staffing over the next ten years.

For this summary, we are assuming the following:

- R&D support ($20M) for NSLS-II beginning in FY 07
- $19M in operating funds for the CFN beginning in FY 08
- $28M in operating funds for EM in FY 07, $23M in FY 08, $19M in FY 09, and $7.0M for LTRA in FY 10
- $30M in operating funds through WFO for JPSI distributed over a five year period, beginning in FY 07
- $60M in operating funds for NSLS-II starting in FY 13, while NSLS is still operating.

- Beyond FY 07, funding levels are escalated by ~3% a year.

As per the TYSP guidance, it excludes construction project funding and shows actual funding for FY06, current projections for FY07, and Presidential Budget funding levels for FY08.

Table C-5 Summary of Expected Funding ($M) and Staffing

Funding	FY06	FY07	FY08	FY09	FY10	FY11	FY12	FY13	FY14	FY15	FY16	FY17	FY18
Total $	440	451	496	515	521	542	654	632	656	689	712	736	758
Total Staffing: (FTEs)	2,513	2,550	2,650	2,690	2,700	2,700	2,720	2,820	2,820	2,820	2,820	2,820	2,820

D.0 FACILITIES AND INFRASTRUCTURE

D.1 VISION, GOALS, AND STRATEGY (VGS)

D.1.1 Vision

BNL's vision is to bring the power of science and technology to bear on questions that are of utmost significance to the U.S. taxpayer and the DOE, with the goal of becoming the best science laboratory in the world in *chosen* areas. Our vision relies on outstanding operations, including building and operating unique facilities, and vital relationships with our communities and stakeholders, and with other world-class research institutions.

A well maintained and reliable infrastructure is considered to be a major platform for the Laboratory's science and technology mission. Accordingly, the goals and objectives for our infrastructure are derived directly from BNL's strategic science planning. While the current physical plant has facilitated BNL's mission for many years, the less than optimum condition, capability, and location of facilities have hampered it. This, in turn, has diminished the Laboratory's ability to attract and retain key staff, increased operating costs, constrained the efficiency of our employees and users, and limited our ability to undertake certain aspects of our mission.

D.1.2 Goals

BNL's first and foremost infrastructure objective is to ensure the DOE's goal of enabling great science by facilitating new opportunities for frontier research that will support the Laboratory well into the future. To achieve this objective, in 2000 BNL developed several goals as part of its Master Plan process. They remain today and relate well to the objectives of the DOE infrastructure Initiative (Table D-1)

Table D-1 Relationship of BNL's Infrastructure Goals to DOE's Infrastructure Initiative Objectives

	DOE INFRASTRUCTURE OBJECTIVE				
BNL GOAL	Right-Sized	Preferred Working Environment	Safe, Healthy, Secure	Information Infrastructure	Efficient
Establish quality workplaces for users and employees	X	X	X		X
Consolidate science-theme areas	X	X		X	X
Encourage interdisciplinary interactions		X			X
Create a positive user-experience		X	X	X	
Incorporate information technology				X	
Establish openness and community relations			X		
Support safe, environmentally sound, and cost-effective operations		X	X		X

D.1.2.1 Establish Quality Workplaces for Users and Employees

This goal is one of both quantity and quality. BNL's staff and users are primary customers and must be supported with sufficient high-quality workplaces. These workplaces should be appropriately located in proximity to their colleagues and/or their experiments, and should be equipped with the proper information-technology tools. Planned improvements must increase the productivity of our scientists and users while they are here, thus leveraging the scientific output from the DOE's investment in our major user facilities.

BNL's specific objectives include the following:

- Providing new "right-sized" facilities thereby allowing the consolidation of BNL's users and staff into modern space, including offices, conference rooms, and administrative support and seminar space. With this "right-sizing", BNL can improve efficiency by reducing its footprint, thereby focusing maintenance funds on mission-critical facilities, and reducing the deferred maintenance backlog by demolishing unneeded facilities.
- Upgrading existing permanent lab/office space to achieve a safe preferred working environment supportive of the world-class facilities needed to attract and retain world-class staff.
- Improving the network infrastructure servicing users' workspaces
- Bringing the Laboratory into compliance with the Americans with Disabilities Act (ADA)

D.1.2.2 Consolidate Science Theme Areas / Encourage Interdisciplinary Interactions

BNL's current scientific leadership themes are far more interdisciplinary than those of previous years. Consequently, existing permanent lab/office buildings currently dedicated to one discipline (e.g., Physics, Chemistry, Medical, or Biology) must be reconfigured and supplemented by new, flexible laboratory buildings that can accommodate multidisciplinary science.

This goal encompasses the following specific objectives:

- Renovating major permanent lab/office buildings. For the most part these buildings have structural systems that will last beyond the 10-year planning period; however, their electrical- and mechanical-systems have reached the end of their economic life (30-40 years). Specific alterations and upgrades will be incorporated into these renovations to increase the flexibility and adaptability of the space to support future missions.
- Developing new general-purpose laboratory/office facilities, as required, to meet the mission's needs to organize and consolidate staff into more efficient workgroups, and promote the interaction of interdisciplinary scientific teams.
- Locating new scientific facilities in strategic locations to promote interactions among the scientific staff.
- Upgrading information technology site-wide to enable staff to more readily share information.
- Providing library facilities that can accommodate the state-of-the-art requirements of scientific staff and users.

D.1.2.3 Ensure a Positive User Experience

The success of many of BNL's user facilities is dependant in large part on the contributions of the approximately 4,000 visiting scientists who use them each year. It is important that BNL provide needed support from the site infrastructure, networking, transportation routes, housing, and recreational facilities to make their visits both professionally productive and personally satisfying. The following specific objectives are designed to achieve this goal:

- Providing facilities to streamline the users' orientation and training.
- Facilitating their transportation and movement throughout the site by providing well planned and designed vehicular- and pedestrian-pathways.
- Consolidating the Laboratory's support organizations and administrative services (e.g., Credit Union, Human Resources, and Staff Services) so that they may be really accessed by users and staff.
- Providing modern, efficient, safe, and comfortable workspaces and housing specifically designed and located to support the users throughout the duration of their stay at BNL.
- Ensuring the availability of adequate conference and videoconference facilities for scientific meetings and discussions.
- Supporting the educational and recreational-needs of users and their families.

D.1.2.4 Incorporate Information Technology

Offering the latest capabilities in information technology is a key factor in meeting several infrastructure goals. The following objectives are specific to this goal:

- Continue to keep pace with advances in information technology by developing and maintaining a site-wide fiber-optic "utility" system.
- Provide and upgrade facilities, as needed, to make space available for computing and communications assets, and to decrease the vulnerabilities of the site's networking infrastructure.

D.1.2.5 Establish Openness and Community Orientation

The long-term success of the Laboratory is dependent upon support of the surrounding communities and stakeholders. Programs with adequate infrastructure support dedicated to nurturing this support, must be provided by the Laboratory. The Laboratory should:

- Develop efficient facilities to receive, orient, and document visitors to the site.
- Provide facilities that support and encourage community outreach, such as science education.
- Provide facilities that offer cultural resources to the community, employees, and users.

D.1.2.6 Ensure Safe, Environmentally Sound, and Cost-Effective Operations

Many Laboratory systems and processes were established to support this goal. Among them, the condition and configuration of the Laboratory's physical plant play a key role. Hence, the following are our specific objectives:

- Eliminate ES&H deficiencies as part of on-going efforts to renovate permanent buildings and demolish those that have exceeded their useful lives.
- Consolidate support organizations to improve efficiency and reduce operating costs.
- Improve services to on-site "customers" and reduce costs by consolidating maintenance- and fabrication-shops.
- Provide state-of-the-art capabilities for handling materials.

D.1.3 Strategy

The goals delineated above are dependent on a coherent strategy that takes into account not only those objectives considered critical to success but a recognition of the fact that, due to funding constraints, not every goal or objective can be accomplished. This unfortunate circumstance complicates the prioritization processes and drives creativity in the search for an optimal strategy. As a multi-program Laboratory it is incumbent upon BNL to ensure that funds are applied to best address not only the immediate sustainment needs but also to allow for the future flexibility that the continuing and new science missions will demand. BNL has developed a prioritization process that uses a combination of DOE approved methodologies and BNL specific criteria. We are confident that those projects selected for funding will contribute to achieving those strategic objectives that are deemed to be of utmost importance.

While new directions and new facilities are paramount to BNL's success it is also important to evaluate the value of current assets and to weigh the pros and cons of maintenance versus replacement. Accordingly, BNL has differentiated between those facilities considered to be "permanent" and worthy of sustainment, and those that have reached the end of their service life and have limited value in terms of future mission capabilities. Underutilized facilities in the latter category will be closed and eventually demolished thereby allowing for the "right-sizing' of remaining permanent structures. Consolidation opportunities will be explored and co-location will be afforded those activities and organizations that express the synergistic need that co-location provides.

The ability to hire and retain a highly skilled staff requires facilities that provide a "preferred" working environment the employs the latest advances in information technology to enhance worker productivity and to advance the scientific effort to the extent possible. Investments must be made in providing an unsurpassed quality of training with adequate conferencing and research support facilities. Providing a safe, healthy, and secure working environment for in-house staff as well as visitors will be a primary objective as will the need to provide quality accommodations to visiting scientists.

D.1.3.1 Existing and Expected F & I Deficiencies

Many of BNL's existing maintenance deficiencies are self evident and include such items as roof leaks, deteriorating wood structures, and mechanical and electrical equipment failures. These are corrected to the extent possible as they surface. Tose that require supplemental funding are added to the deferred maintenance (DM) list and are addressed as funds become available. However, there are numerous deficiencies that are not so obvious and these are identified by an in-depth assessment program. BNL relies heavily on its maintenance supervisors and engineers who have 'hands-on" knowledge of mechanical and electrical systems and their components. These subject matter experts are critical to the maintenance management component of the Laboratory and funding decisions are based in large part on their input. Factors entered into funding decisions include safety and health to employees and guests, potential impact to programs, and the need to reserve facilities and building and utility systems for the long-term. Competing issues are weighed on the basis of risk/benefit, possible mitigating actions, and overall potential to contribute to meeting the Laboratory's goals.

D.1.3.2 Prioritization to meet Vision/Goals

The renovation of aged laboratories and their associated infrastructure continues to challenge the development of a comprehensive prioritization strategy. As programmatic mission activities and technological changes advance into the 21st century it will be necessary for F&I management to work in close harmony with the scientific staff in order to maintain awareness of emerging scientific initiatives and to reassess future needs in a timely fashion. The prioritization process at BNL encompasses the entire Laboratory. Participants are at every level, from the individual researcher, to organizational management, to the Policy Council, to the Director. Staff who perceive a need are encouraged to prepare an Activity Data Sheet (ADS) that identifies the perceived need or deficiency, and the rationale for funding. Every ADS contending for funding is scored by subject matter experts using DOE approved methodologies. Subsequent to scoring, every ADS is placed in "Bins" by senior Laboratory management on the basis of current Laboratory strategic goals and objectives. Projects are then considered by the Policy Council based on their Bin placement and score. Section D.2.9 describes the "Prioritization" process in more detail.

BNL funds those ADSs that support the most urgent needs and strategic objectives. Projects are funded from both overhead funds and GPP, based on the nature of the project.

D.1.3.3 New Directions

The new Office of Science SLI Program has re-energized the Laboratory's vision and it is now apparent that what has been a distant goal may now be realized in a more near-term time frame. The strategy of patch and repair that drove the prioritization process in the past is now re-directed to the attainment of loftier goals and BNL is prepared to implement an asset management plan consistent with this new direction.

Accordingly, in FY07, BNL will start the "Renovate Science Lab Phase I" project that will significantly reduce its deferred maintenance backlog. This project will directly support DOE's infrastructure objectives of having a "preferred" working environment, ensuring

facilities are safe and environmentally friendly, have modern information infrastructures, and are efficient to operate and maintain.

The “Interdisciplinary Science Building” project currently proposed for FY09 SLI funding will allow scientific staff to consolidate from old, inefficient buildings, to a new modern facility. This facility will allow for the further consolidation of staff to reduce the Laboratory’s operating costs by allowing demolition of space that is not cost-effective to maintain.

As the new SLI funded facilities are completed, scientific staff will be relocated from the older but “permanent” buildings. It is intended that support staff, with less technical requirements, be moved into these buildings. This will allow for the demolition of those wooden buildings they now occupy. However, the remaining “permanent” buildings occupied by scientific staff will require a considerable amount of rehab and upgrade work. The estimated value of this work is $150M - $200M. To accomplish this various aspects of the work will be funded by Line Items, IGPP, deferred maintenance reduction funds, and regular maintenance funds, as appropriate.

By increasing its Maintenance Investment Index to 2.0%, BNL has slow down the increases in the deferred maintenance backlog to escalation levels only.

In FY09, BNL will generate IGPP funds at a level consistent with the burdened value of current GPP levels. This will ensure that funds are available to provide infrastructure support to proposed SLI projects.

D.1.3.4 Legacy Issues

One concern is obtaining funding to address legacy issues. BNL assembled these issues together as part of an SC initiative to handle facilities that EM did not take into its program, but the SC initiative was not funded. Subsequently, SC and BHSO have been working to transfer these to EM. The current status is that Mission Need Statements for three projects totaling $54M were submitted to EM in May 2007 and are under consideration. They are as follows:

- Remediation of potential environmental release areas including A&B waste lines, former hazardous waste area perimeter, and shot gun range.
- D&D of the Brookhaven Medical Research Reactor (BMRR)
- Cleanup of non-reactor facilities including Building 650, Building 801 D&F waste tanks, Building 830 contaminated equipment, and Building 901 Cyclotron and Dynamitron

D.2 PROCESS FOR IDENTIFYING FACILITY & INFRASTRUCTURE NEEDS

D.2.1 Overview

BNL's infrastructure requirement for meeting the Laboratory's vision and goals and strategy for obtaining them were developed mainly from the following sources;

- DOE Business Plan for the Office of Science, BNL (2007)
- BNL Strategic Plan 2007
- BNL's Annual Laboratory Plan 2007
- Site Master Plan 2000 / 2004 Update
- SC Infrastructure Initiative 2007
- EM Projects Life-cycle Baselines (Draft)
- Condition assessment surveys

The following processes, although smaller in scope, also contribute to identifying these needs:

- Tier I / Life Safety/ NEC inspections
- Operational readiness reviews
- Exit readiness reviews
- Space Consolidation Plan
- Program assessments

D.2.2 DOE Business Plan for the Office of Science's Brookhaven National Laboratory

As per Congressional language from the "House Energy and Water Development Committee Report on the FY05 Appropriations Bill, which was agreed to in the subsequent Conference Committee Report", on 1/15/05 Dr. Orbach notified each Laboratory Director of the requirement to prepare a Business Plan. Its purpose was to outline the "primary mission…as it related to each Lab's lead program office(s), a clear statement of secondary missions to support other DOE program offices and other Federal agencies, and a five-year plan identifying research, facilities, and resource requirements necessary to fulfill these primary and second missions." Toward this goal, Dr. Orbach scheduled a meeting with each Laboratory to learn about what it proposed to include in such a Business Plan. It was followed by a ~30 page document that outlined the Director's presentation and answered key questions that arose during it, as per the guidance provided by SC. Subsequently, BNL (and each of the other Labs) worked with SC to condense their Plans. The abridged versions, along with the Five Year Budget Plans, were sent to OMB in March 2006. At the request of SC, the condensed version (DOE Business Plan for the Office of Science's Brookhaven National Laboratory) was updated according to their guidance and submitted in March 2007.

D.2.3 BNL Strategic Plan

The FY 2007 Strategic Plan for Brookhaven National Laboratory (BNL) describes the path that we will pursue over the next several years to ensure the evolution of BNL's ability to meet the Department of Energy's (DOE's) anticipated needs and those of the nation. This document serves as a primary basis for the *Annual Lab Plan/Business Plan* and the *Ten Year Site Plan*. It is a living document, evolving with time. A Strategic Focus Area (SFA) framework was adopted in preparing this plan and the Annual Laboratory Plan. The following are the SFAs:

- Advancing the Frontiers of Science
- Attracting and Sustaining Top Talent
- Modernization of Laboratory Infrastructure
- Improving the Quality and Reducing the Cost of Business
- Achieving Excellence in ESS&H
- Fostering Stakeholder Relationships

They serve as a framework for planning and performance monitoring at the institutional level enabling resource allocation decisions within a strategic framework. It can be found at: http://intranet.bnl.gov/planning/

D.2.4 BNL Annual Laboratory Plan

The FY 2007 Annual Laboratory Plan (ALP), aka Business Plan for Brookhaven National Laboratory defines the priorities and the targets for institutional performance for FY07. The ALP has been structured within the SFA framework, which is outlined in the Brookhaven National Laboratory Strategic Plan. For the Laboratory to be successful in executing its strategy, a clear understanding of the institutional objectives and annual targets is needed, along with the alignment of resource investments to meet those objectives and a framework to monitor performance towards them. That is the purpose of the ALP; in each of the six areas of strategic focus, the goals and near-term objectives from the Strategic Plan and Ten-Year Site Plan are connected to targets for FY07.

The ALP also establishes the framework for monitoring performance and progress towards meeting key institutional-level goals and objectives over the course of FY07. While achieving strategic objectives is critical for long-term success of the Laboratory, achieving those objectives at the cost of reduction in critical performance areas is counter productive and will inevitably impact the strength of the Lab Science and Technology mission. Hence the ALP also encompasses performance monitoring for activities that are critical to sustaining the laboratory's current activities. It can be found at: http://intranet.bnl.gov/planning/. BNL documents progress toward its targets every four months and prepares a "dashboard" summary report which coincides with the BSA Board Meetings. Thus, it is a living document.

As mentioned above, "Modernizing the Laboratory Infrastructure" is one of the six SFAs adopted for preparation of the Strategic and Annual Lab Plan. Its goal is to provide a world-class platform for forefront scientific research by conveying a positive image of the Laboratory as a forefront, world-class laboratory; serving as a recruiting tool to aid in

attracting and sustaining top talent; providing state-of-the art scientific support facilities; and providing a work environment that is operationally reliable and cost competitive. In FY 2007, the ALP included specific targets related to meeting cost and schedule for the Research Support Building, renovating laboratories and housing, reducing the maintenance backlog, and ensuring the reliable operation of facilities, all of which are intimately tied to the goals of the TYSP.

The objectives and targets in the ALP will be revised annually to ensure resources are focused on the latest goals and near-term objectives that have been established in the updated Strategic Plan and the Ten-Year Site Plans.

D.2.5 BNL Master Plan

Following the philosophy that infrastructure is a platform for research, the Laboratory Director established a Master Plan Steering Committee (MPSC) chaired by the Deputy Director for Operations. The committee was charged to develop a science-driven plan. The members of the MPSC include both Deputy Directors, two of the five science Associate Laboratory Directors, three Assistant Laboratory Directors, and the Deputy Manager of the DOE's Brookhaven Site Office (BHSO). A professional planning firm, the S/L/A/M Collaborative, supplemented the efforts of the MPSC and the Plant Engineering Division's planning staff.

The Site Master Plan required significant stakeholder involvement including outreach to several specific groups:

- BNL employees, visitors and guests
- BNL Users
- DOE BHSO
- Community Advisory Council
- Civic Association leaders and community representatives
- BNL Department Chairs and Division Managers

A web site, poster sessions, roundtable meetings, surveys, and formal presentations ensure effective communications.

The MPSC, with the support of S/L/A/M, reviewed the Laboratory's strategic science plans, as well as all stakeholder input, and assessed the ability of the current infrastructure to support the rational evolution of current programs and to accommodate new ones that might reasonably be expected to come to BNL. Then, the MPSC developed a set of Planning Assumptions. Shortfalls in the current infrastructure ("gaps") were discussed in terms of mission capability, facility condition, and the effectiveness of the current location of support functions. From that, requirements were generated to meet the identified infrastructure goals.

Various options for filling these "gaps" were evaluated at several MPSC – S/L/A/M workshops, all of which the Laboratory Director attended. From successive options/approaches selected planning proceeded from a land-use template, to functional

site layout, to location of individual facilities. Pre-conceptual scoping of specific projects to meet the identified requirements followed.

A subcommittee of the MPSC took the next step in planning to determine the relative priority of the various projects. This process was based on an assessment of the level of the project's contribution to meeting the Infrastructure Goals and Objectives and, where applicable, the need to make the location available for high-priority new construction. In each case, an estimated return on investment (ROI) was determined.

Finally, for accomplishing the specific project, the most suitable funding source was determined that included operating funds (OE), General Plant Projects (GPP), General Purpose Equipment (GPE), line-item construction and third-party financing. The findings of this planning are shown in the Integrated Facilities and Infrastructure (IFI) crosscut (Appendix 4).

D.2.6 SC Infrastructure Initiative

Preparing BNL's response to the call for projects involved reviewing the Site Master Plan's objectives and the projects that resulted from it. The outcome of the review was fully consistent with BNL's original thinking: a mix of new facilities, renovating selected facilities, and consolidating out of old facilities, such as the wood buildings constructed between 1940 and 1945.

D.2.7 EM Projects Life-cycle Baselines

EM currently has three projects at BNL; the BNL Soil and Water Remediation Project; the BGRR Decontamination and Decommissioning (D&D) Project; and the HFBR D&D Project. These projects are managed by the EM's Consolidated Business Center for the EM Headquarters Office of Small Sites and Site Support with support from BHSO. An MOU between BHSO and the Office of Small Sites and Site Support is being negotiated to outline roles and responsibilities, interfaces, etc., for the management and execution of these projects.

Physical work was completed for the BNL Soil and Water Remediation Project and Critical Decision (CD) - 4, Approve Project Completion, was approved by EM-1 in July 2006. EM currently funds the associated long term management, operations and monitoring known collectively as Long Term Stewardship or Long Term Response Actions (LTRA) for the project, which is discussed further in Section D.5. High priority removal actions have been completed on the BGRR D&D Project and the remaining scope involves the removal of the Brookhaven Graphite Research Reactor (BGRR) graphite pile and biological shield. The HFBR D&D Project scope includes the near-term dismantlement and removal of the HFBR stack, fan house, ancillary buildings, contaminated underground lines, the removal and disposal of control rod blades and beam plugs, and the disposal of legacy waste. The final End-State is currently being negotiated with the regulatory agencies through the CERCLA process. Remediation of contaminated soil at the Waste Loading Area is also included. At the end of this work, BNL will prepare and transition both reactor facilities to long-term surveillance and maintenance (S&M). The projects also include the regulatory close-out of the two Areas of Concern for these reactor facilities in accordance with the tri-party Interagency Agreement signed by the DOE, the United States Environmental Protection

Agency Region II, and the New York State Department of Environmental Conservation, and preparing materials and reports to support the DOE's review and approval of CD-4.

The HFBR and BGRR DYD Projects are discussed in additional detail in Section D.4 with post CD-4 Long Term Stewardship activities discussed in Section D.5.

D.2.8 Other Planning Processes

The Tier I inspection process ensures that the Laboratory's space is periodically reviewed and ES&H issues are identified for correction. Further, BNL hired outside expertise to review its facilities for compliance with life safety and the National Electrical Code. Operational- and exit- readiness reviews ensure that when space is vacated or reused any existing legacy ES&H issues are documented and entered into the project's backlog. The space-consolidation plan identifies projects that will improve the efficiency of operations and maintenance by consolidating space, and identifying additional excess facilities for demolition. Each year, various internal- and external-program assessments and reviews are undertaken to identify any additional infrastructure requirements that BNL's programs need for continuing efficiency into the future.

D.2.9 Prioritization

The processes described above generate lists of infrastructure needs all of which are recorded in either BNL's ADS database or the maintenance database for smaller projects. The prioritization processes for BNL's General Plant Projects (GPP) and Operations Funded Projects (OE) are described in the Project Prioritization, Programming, and Budgeting Process (3PBP) described in BNL's Standards-Based Management System. This system uses a combination of the following:

- Probabilistic risk, determined either by the DOE's Capital Asset Management System (CAMP) Scoring Criteria for Infrastructure projects or the Risk Prioritization Method (RPM) for ES&H issues. Subject matter experts from BNL and the DOE-BHSO score the projects.
- Strategic risk based on assessing the relevancy of the project to the various strategic planning documents described above. The Consolidation team, composed of senior members from BNL and DOE- BHSO bin the projects.

The combination score for final project selection then is presented to the Laboratory Policy Council, consisting of BNL's senior managers. This final list then goes to the BHSO for review. Adjustments are made, based on comments, with final resolution following discussions between the BHSO and BNL's senior managers.

D.3 LAND USE PLAN

BNL's Land Use Plan contained in Appendix 1 was revised to reflect the current Site Master Plan and BNL's Strategic Plan. The funded NSLS-II project will be developed on cleared open space formerly used for recreation. Adequate recreation space will remain and the

NSLS-II space will be classified for industrial use as shown in Appendix 1 on the Future Use Map, Figure E-3.

D.4 UTILIZATION AND EXCESS REAL PROPERTY

The tables below show office, warehouse and laboratory buildings and their respective Asset Utilization Index (AUI). A weighted average AUI was calculated for each category. For offices (Table D-2), the AUI is 96.3% exceeding the DOE target of 93.5% for FY07. Planned consolidation will further improve this number.

Table D-2 Asset Utilization – Offices (Use Code 101)

ID	NAME	GROSS SF	USE	AUI
0051	Environmental Restoration	12,377	101	0.4311
0097	Maintenance Management Center	3,755	101	1.0000
0120	ESH&Q Office Building	13,402	101	1.0000
0129	ITD,TFCU & Science Museum Staff Offices	10,107	101	0.6804
0130	Engineering/Safety & Risk Technology	19,649	101	0.9199
0134	Plant Engineering	30,593	101	1.0000
0179	EENS Admin/Post Office/Mailroom	15,025	101	0.9247
0185	Office Building	12,122	101	1.0000
0197	NNSD/Graphic Arts/NNDC	52,029	101	0.8642
0211	Procurement & Property Management	4,928	101	1.0000
0326	Site Maintenance Office	8,150	101	1.0000
0355	Contracts & Procurements	10,295	101	1.0000
0460	Director's Office	17,762	101	1.0000
0464	DOE-BHSO Group Office	11,644	101	1.0000
0475	Energy Science & Tech	24,736	101	0.9633
0510	Physics	201,929	101	0.9977
0754	Emergency Operations Facility	2,121	101	0.6812
0817	Engineering Support Facility	8,828	101	1.0000
0860	WMF-Operations	12,364	101	1.0000
0911	Office/Service Building	100,663	101	1.0000
0938	Radiation Effects Facility	5,272	101	0.7688
0650T	Construction Group	1,985	101	1.0000
0728M	NSLS Office Building	3,662	101	1.0000
0933A	Site Maintenance Riggers Supervisor	937	101	1.0000
1005S	Collider Center	40,791	101	1.0000
1006D	Office Modular	1,432	101	1.0000
1008E	Office Modular	4,276	101	1.0000
	Weighted Average – Offices	630,834		96.3%

For warehouses (Table D-3), the AUI is 98.5% exceeding DOE's 88.5% target. BNL has consolidated warehouses for the past several years, and plans to continue consolidation in FY07 and FY08.

Table D-3 Asset Utilization - Warehouses

ID	NAME	GROSS SF	USE	AUI
0087	Excess Property Warehouse	9,353	400	0.8961
0100	Bulk Warehouse	13,947	400	1.0000
0210	Gases Warehouse	5,460	410	1.0000
0821	Heat Transfer/Fluid Dyn Storage	463	401	1.0000
0835	CAD Warehouse	7,115	401	1.0000
0918	AGS Warehouse	16,526	401	1.0000
0926	Receiving/Warehouse	10,091	401	1.0000
1101	CAD Warehouse	2,490	401	1.0000
	Weighted Average – Warehouse	65,445		98.5%

For laboratory buildings (Table D-4), the AUI is 89.3% exceeding the DOE's target of 86%. Current plans for using space in the facilities with the lowest AUI should bring the average over 93%. Specific initiatives are as follows:

- Building 703 – Current AUI 32.6%
  Space is being readied to house R&D work for the NSLS II project; the AUI should increase to ~90%.

- Building 801 – Current AUI 80.7%
  Space is being readied for use by the FBI; the AUI should increase to ~85%.

- Building 820 – Current AUI 62.4%
  Some non-laboratory portions of the building are being considered for use as part of our warehouse consolidation. If implemented, the AUI should increase to ~ 80%.

Table D-4 Asset Utilization – Laboratory Buildings

ID	NAME	GROSS SF	USE	AUI
0348	Calibrations	7,595	704	1.0000
0356	Solid State Irradiation Facility	4,391	765	1.0000
0421	Structural Biology	5,980	741	1.0000
0463	Biology	113,546	741	0.9858
0480	Materials Science	40,786	703	1.0000
0487	Soil Analysis Building	3,000	761	1.0000
0490	Medical Research Center	222,512	742	0.8300
0526	Energy Efficiency & Conservation	29,158	703	0.9590
0535	Instrumentation Division	76,911	731	1.0000

ID	NAME	GROSS SF	USE	AUI
0555	Chemistry	151,467	711	0.9960
0560	High Field MRI Lab	4,033	742	1.0000
0703	Lab/Office Building	84,525	791	0.3260
0729	NSLS Source Development Laboratory	8,018	721	1.0000
0801	Isotope Research and Processing	51,056	782	0.8067
0815	EENS Multi-program Laboratory	64,228	703	1.0000
0820	ATF / Vacuum Group	29,507	703	0.6249
0830	Environmental Waste Technical Center	28,946	792	1.0000
0836	Thermal Distribution Research Facility	1,021	703	1.0000
0901	Radioisotope and Radiotracer C	34,301	712	0.7080
0906	PET Imaging Laboratory	4,805	742	1.0000
0912	AGS Experimental Halls	184,870	724	1.0000
0931	BLIP	2,066	792	1.0000
0958	NASA Space Radiation Laboratory	4,554	742	1.0000
1002	Brahms Experimental Hall	4,948	724	1.0000
1006	Star Experimental Hall	16,801	724	1.0000
1008	Phenix Experimental Hall	11,874	724	1.0000
1010	Phobos Experimental Hall	8,501	724	1.0000
1002D	Brahms Counting House	1,134	724	1.0000
1006C	Star Counting House	1,838	724	1.0000
1008C	Phenix Counting House	1,163	724	1.0000
1010B	Phobos Counting House	1,137	724	1.0000
	Weighted Average – Laboratories	1,204,672		89.3%

One of BNL's strategic infrastructure goals is to consolidate staff occupying old wood buildings into more modern spaces. The recently constructed Research Support Building allowed consolidation, and consequently, some 65-year-old wood buildings will be declared excess. Based on our consolidation plan, buildings that will be declared excess in the next few years are B/475 and parts of B/134 and B/179. BNL continually reviews its real property needs and updates the FIMS as needed.

BNL's preference has been to use funds from the DOE Excess Facilities Program to raze excess buildings as they are declared excess. As part of the SC Infrastructure Initiative (SCII), these funds are expected to stop in FY09. While demolition of space will be included as part of the SCII, funds for the demolition of contaminated building like B/491 (Medical Research Reactor) and B/650 (Hot Laundry) are not likely to be part of the SCII. While transfer of these facilities to EM is being sought, the outcome is uncertain.

Appendix 6 lists details of buildings to be declared excess, some of which are conditional. Examples of assets that conditionally are available for demolition are those associated with the proposed alternately-financed project for a support office building. If implemented, some existing wood building and other older buildings could be demolished.

In addition to the DOE-SC building program discussed above, the DOE EM projects plans to raze several buildings over the planning period; they also are discussed in Appendix 6.

The following two D&D projects are in progress by EM:

Brookhaven Graphite Research Reactor (BGRR) D&D Project

The BGRR D&D Project Draft Performance Baseline describes the work scope, costs, and schedule to complete the remaining D&D work included in PBS-CH-BRNL-0040. High priority removal actions were completed in FY 2005. This Baseline covers all the work required to fulfill the DOE's responsibilities under the BGRR Record of Decision that was approved on March 17, 2005. As DOE's prime contractor, BSA will have overall responsibility for completing the BGRR project.

This work includes the following items:

- Removal of the graphite pile
- Removal of the biological shield
- Transportation and disposal of all project wastes.
- Installation of an engineered water infiltration barrier around the BGRR reactor building (Building 701).
- BGRR surveillance and maintenance through the end of FY2010.
- Regulatory closeout of the construction phase of the BGRR project.
- ES&H and management oversight and support of project activities throughout the period of performance.

At the conclusion of the BGRR project, in accord with the record of decision, the graphite pile (internally designated as structure ST0702) will be completely removed from the BGRR reactor building (Building 701) and the biological shield superstructure and bedplates will be removed up to the 107'-0'elevation. A concrete pad will be placed over the footprint of the biological shield to provide shielding from residual radioactive material embedded in the remaining structure of Building 701.

Other structures, systems and components from this building will only be disturbed to the extent required to remove the pile and biological shield. Collateral dismantlement of physical interferences will be limited to various experimental balconies that are attached to the biological shield, the freight elevator, and portions of the control-rod drive mechanisms.

The balance of Building 701 will constitute part of the engineered cap to prevent access to, and prevent water infiltration to contaminated soil located below the building. The Building 701 structure will remain in place as will all other structures, systems and components not disturbed during graphite pile and biological shield.

In preparation for the transition of the BGRR to the DOE's Office of Science and BSA's operating organization, a radiological survey of Building 701 will be made. A Surveillance and Maintenance Manual will be prepared for DOE approval as well as regulatory concurrence setting forth the requirements for periodically maintaining the remaining BGRR

complex in accordance with DOE's and BSA's requirements. A comprehensive formal plan will guide the transition process, and an Exit Readiness Evaluation will be performed in accordance with BSA requirements prior to BGRR turn over to the BSA operating organization.

The estimated cost to complete the project work is $45 M and the project is expected to be completed in FY 2010.

High Flux Beam Reactor (HFBR)

The HFBR D&D Project scope involves:

- Completion of CERCLA decision-making through final DOE and regulator approval of the HFBR ROD.
- Completion of preparatory activities required for control rod blade (CRB) and beam plug removal. These activities include the completion and DOE approvals of the HFBR decommissioning project Documented Safety Analysis (DSA) and Technical Safety Requirements (TSRs), and detailed planning required for CRB and beam plug removal on this time line.
- Completion of the removal of ancillary structures and systems including the fan houses, stack and underground utility lines.
- Completion of near-term activities required to prepare the HFBR facility for interim safe-storage. This includes the physical isolation of mechanical systems to reduced sources of energy and water in the confinement building, and the removal of lithium arsenite from the confinement building refrigeration plant.
- HFBR surveillance and maintenance throughout the DOE-directed period of performance.
- ES&H and management oversight and support of project activities throughout the period of performance.
- A thorough and documented transfer of the HFBR facility to the BNL operating organization for interim safe-storage including the conduct of an Exit Readiness Evaluation and transition to a long term surveillance and maintenance mode.

The Performance Baseline for the HFBR D&D project will be completed after the End-state has been finalized. At this time, it is anticipated that the HFBR D&D Project will be completed by FY 2020 with estimated costs of $30M. Note that the HFBR is an EM facility and EM funds the baseline preparation and surveillance and maintenance activities until such time that D&D is completed and the facility transferred back to SC.

In addition to the two EM projects described above, Mission Need Statements for three proposed projects, totaling $54M, were submitted to EM in May 2007 and are under consideration. They are as follows:

- Remediation of potential environmental release areas including A&B waste lines, former hazardous waste area perimeter, and shot gun range.
- D&D of the Brookhaven Medical Research Reactor (BMRR)
- Cleanup of non-reactor facilities including Building 650, Building 801 D&F waste tanks, Building 830 contaminated equipment, and Building 901 Cyclotron and Dynamitron

D.5. LONG TERM STEWARDSHIP (LTS)

D.5.1 Long Term Stewardship Assets

EM's LTS or Long Term Response Action (LTRA) program involves the project management, administration and implementation; environmental monitoring, reporting, and information management; groundwater remediation operations and maintenance; and surveillance, maintenance for the Soil and Water Project (i.e. completed surface projects, groundwater, landfills and the Peconic River. DOE-EM currently funds these activities, which involves approximately $6-7M per year, and is expected to do so until such time that DOE-EM completes its mission at BNL (called EM Site Completion) in FY 2020. EM LTS activities also include surveillance and maintenance for the BGRR and HFBR facilities after D&D has been completed.

BNL assets are owned by either the DOE-SC or the DOE-EM. Table D-5 shows those assets owned by EM. They can be categorized as follows:

- Active groundwater treatment plants. These EM assets are active buildings and OSF assets covered in the Soil and Water LTRA program..
- Groundwater monitoring wells. These assets are active EM OSF assets covered in the LTRA program.
- Reactor Decontamination and decommissioning (D&D) projects. These are EM assets that will remain will be transferred back to SC after EM has completed its mission at BNL.

The active groundwater treatment plants and groundwater monitoring wells are covered in the LTRA program.

After completion of all EM Project scope, EM assets will be transferred to SC for surveillance and maintenance and the remaining long term operations. The transfer of long term responsibilities from EM to SC is governed by SC/EM Terms and Conditions for Site Transition.

Table D-5 LTS Assets

ID	FACILITY NAME	YEAR BUILT	FIMS TYPE
GROUNDWATER TREATMENT PLANTS			
0516	Ground Water Pump Station (Middle Road)	2001	BUILDING
0517	Ground Water Treatment Facility	2001	BUILDING
0518	Ground Water Treatment Facility	1997	BUILDING
0519	Ground Water Pumping Station	1997	BUILDING
0521	Air Sparge / Soil Vapor Extraction System	1994	BUILDING
0539	WSB Ground Water Recovery Unit	2002	BUILDING
0598	Ground Water Treatment Plant	1998	BUILDING
0645	Well Control House	1997	BUILDING
0670	Sr-90 Pilot Ground Water Treatment Facility	2003	BUILDING
2360	OER Monitoring Wells	1995	OSF
2395	OER Pump & Treat Con (Off Site @ I.P.)	1998	OSF
2410	S. Boundary Pump & Treat Sys.(OU III)	2002	OSF
2415	Middle Road Groundwater Pump/treat	2002	OSF
2420	Western South Boundary Treatment Sys(539)	2002	OSF
2425	VOC Treatment System (B/96)	2002	OSF
2430	Sr-90 Treatment System (B/670)	2003	OSF
GW_TREATMENT	Treatment Plants	1965	OSF
OS-1	Industrial Park Treatment System	2003	OSF
OS-3	LIPA Vault	2003	OSF
OS-4	Airport Treatment System	2003	OSF
OS-5	North Street Treatment System	2003	OSF
OS-5E	North Street East Treatment System	2003	OSF
OS-6	OU VI - (EDB) Plume Treatment System	2003	OSF
BGRR RELATED ASSETS			
0701	BGRR	1949	BUILDING
0704	Fan House	1949	BUILDING
0802	Fan House	1950	BUILDING
2405-STACKDRAIN	Liquid Waste Piping System	2001	OSF
HFBR RELATED ASSETS			
0750	High Flux Beam Reactor	1964	BUILDING
1090-HFBR	HFBR Vessel and Assoc. Systems	1964	OSF
0715	Stack Monitoring Station	1979	BUILDING

D.6 REPLACEMENT PLANT VALUES (RPV) ESTIMATES

Table D-6 below has the Replacement Plant Value (RPV) estimates for FY04-FY18. They were revised to be consistent with the IFI crosscut that was submitted with the budget, based on the TYSP guidance for FY 08- FY18. The expected additions and deletions are detailed in Table D-7.

Table D-6 RPV Analysis by FY (BY Impact used for MII calculations)

FY	BY	INITIAL RPV $	ADJUSTMENTS, $	FINAL RPV $	ESCALATED $
04	07	1,329,226,987			
05	08	1,461,418,057			
06					1,697,998,656
07	09	1,697,998,656	16,331,873	1,714,330,529	1,753,760,131
08	10	1,753,760,131	48,475,065	1,802,235,196	1,843,686,606
09	11	1,843,686,606	3,185,904	1,846,872,510	1,889,350,577
10	12	1,889,350,577	4,000,000	1,893,350,577	1,936,897,641
11	13	1,936,897,641	0	1,936,897,641	1,981,446,286
12	14	1,981,446,286	2,700,000	1,984,146,286	2,029,781,651
13	15	2,029,781,651	35,627,950	2,065,409,601	2,112,914,022
14	16	2,112,914,022	0	2,112,914,022	2,161,511,044
15	17	2,161,511,044	220,000,000	2,381,511,044	2,436,285,798
16	18	2,436,285,798	40,527,222	2,476,813,020	2,533,779,720
17	19	2,533,779,720	9,243,156	2,543,022,876	2,601,512,402
18	20	2,601,512,402	0	2,601,512,402	2,661,347,187

Table D-7 RPV Adjustments By FY, in dollars

FY07 Adjustments		$
Add	B/400	8,200,000
Add	B/817 Addn	1,928,000
Demolish	B/209	(2,172,748)
Demolish	B/650A	(452,661)
Demolish	B/952	(47,553)
Demolish	B/96	(1,123,165)
Total FY07		16,331,873
FY08 Adjustments		
Add	B/735	53,000,000
Add	MHF -New	2,000,000
Add	B/930 EBIS	1,150,000
Demolish	B/100	(2,511,342)
Demolish	B/210	(1,097,533)
Demolish	B/211	(1,480,231)
Demolish	B/87	(1,878,697)
Demolish	B/481	(16,333)
Demolish	B/629	(690,799)
Total FY08		48,475,065

FY09 Adjustments		
Add	B/515 Addn	4,500,000
Add	B/600 Addn	4,500,000
Demolish	B/475	(5,814,096)
Total FY09		3,185,904
FY10 Adjustments	None	0
Add	B/463 Addn	1,000,000
Add	Main Gate Acc	3,000,000
Total FY10		4,000,000
FY11 Adjustments		0
FY12 Adjustments	None	0
Add	B/488 Addn	2,700,000
Total FY12		2,700,000

FY13 Adjustments		
Add	ISD I	66,240,000
Add	RHIC II	7,000,000
Add	Guard Booths	1,800,000
Demolish	B/51	(2,932,633)
Demolish	B/130	(4,274,409)
Demolish	B/179 Partial	(2,106,414)
Demolish	B/185	(2,892,873)
Demolish	B/355	(2,573,538)
Demolish	B/421	(2,014,629)
Demolish	B/462	(8,599,821)
Demolish	B/526	(14,017,733)
Total FY13		35,627,950
FY14 Adjustments	None	0
FY15 Adjustments	NSLS-II	220,000,000
FY16 Adjustments		
Add	ISD II	69,700,000
Demolish	B/120	(3,442,983)
Demolish	B/197	(12,221,986)
Demolish	B/464	(3,083,623)
Demolish	B/473	(2,563,910)
Demolish	B/490 Partial	(5,944,790)
Demolish	B/902 Partial	(1,915,486)
Total FY16		40,527,222

FY17 Adjustments		
Add	Shops I	42,800,000
Demolish	B/97	(1,277,954)
Demolish	B/134	(6,454,347)
Demolish	B/244	(4,780,597)
Demolish	B/346	(55,851)
Demolish	B/405	(808,781)
Demolish	B/422	(6,469,352)
Demolish	B/452	(11,527,534)
Demolish	B/455	(138,594)
Demolish	B/528	(1,939,367)
Demolish	B/652	(104,467)
Total FY17		9,243,156
FY18 Adjustments	None	0

D.7 MAINTENANCE

Table D-8 below, shows the expected spending on maintenance. BNL is committed to meeting the required 2.0% sustainment spending level, based on the RPV guidance provided as part of the TYSP guidance. The IFI Crosscut, located in Appendix 4, cites specific projects.

Table D-8 Proposed Maintenance Expenditures by FY

FY	RPV $	SC GOAL $	DIRECT MNT $	INDIRECT MNT $	TOTAL
07	1,329,226,987	6,584,540	1,653,000	4,931,540	6,584,540
08	1,432,195,209	8,643,904	1,711,000	6,932,904	8,643,904
09	1,697,998,656	3,959,973	1,771,000	2,188,973	3,959,973
10	1,753,760,131	5,075,203	1,833,000	3,242,203	5,075,203
11	1,843,686,606	6,873,732	2,954,000	3,919,732	6,873,732
12	1,889,350,577	7,787,012	3,048,000	4,739,012	7,787,012
13	1,936,897,641	8,737,953	3,109,000	5,628,953	8,737,953
14	1,981,446,286	9,628,926	3,209,000	6,419,926	9,628,926
15	2,029,781,651	0,595,633	3,312,000	7,283,633	0,595,633
16	2,112,914,022	2,258,280	3,418,000	8,840,280	2,258,280
17	2,161,511,044	3,230,221	3,526,000	9,704,221	3,230,221
18	2,436,285,798	8,725,716	3,643,000	5,082,716	8,725,716

D.8 DEFERRED MAINTENANCE REDUCTION

Table D-9 shows the tracking of backlog of deferred maintenance (DM). Table D-10 shows BNL's strategy for reducing the backlog to meet the minimum DM reduction funding level, as requested by the DOE. The deferred maintenance reduction tax will be applied to the space charge to raise the required funding. Also, the backlog will be reduced by eliminating unneeded building space. The IFI Crosscut, Appendix 4, cites specific projects. BNL's maintenance backlog does not separate maintenance projects and deferred maintenance projects, because they both come from the same prioritized backlog list and both are funded from overhead accounts. Since we assumed that the 2.0% MII maintenance spending level will achieve sustainment, additional overhead funds applied to the maintenance project's backlog should reduce it. Thus, BNL's deferred maintenance value will fall down by the corresponding amount minus the effects of escalation of the backlog reflecting increases in construction costs and new deficiencies uncovered.

Using the DOE targets for ACI for Mission Critical, Mission Dependent, and Not Mission Dependent facilities the weighted average ACI is 0.957. This target could be met before FY10.

Table D-9 Deferred Maintenance Reduction (DMR) Plan (all values in $k)

FY	A DM	B DM GROW	C SC TARGET	D BNL DMR FUNDING	E IGPP DM Part of D	F Other DM	G DM YR-END A+B-D-F	H DM W/ ESCAL. G * 1.023	I EST. RPV	J ACI 1 - H/I
07	90,340	536	5,940	2,458	0	294	89,124	91,174	1,329,227	0.933
08	91,174	1,550	7,163	7,163	0	976	84,585	86,530	1,461,418	0.942
09	86,530	1,471	10,447	10,447	0	4,624	72,930	74,607	1,697,999	0.957
10	74,607	1,268	13,730	13,730	0	0	62,146	63,575	1,753,760	0.965
11	63,575	1,081	13,730	13,730	0	0	50,926	52,097	1,843,687	0.972
12	52,097	886	13,730	13,730	0	0	39,253	40,156	1,889,351	0.979
13	40,156	683	0	0	0	2,278	38,560	39,447	1,936,898	0.980
14	39,447	671	0	0	0	0	40,118	41,040	1,981,446	0.980
15	41,040	698	0	0	0	0	41,738	42,698	2,029,782	0.979
16	42,698	726	0	0	0	2,414	41,010	41,953	2,112,914	0.981
17	41,953	713	0	0	0	1,466	41,200	42,148	2,161,511	0.981
18	42,148	717	0	0	0	0	42,865	43,850	2,436,286	0.982

Table D-10 DMR Adjustments By FY, in dollars (Feeds column F – Table D-9)

FY07 Adjust		
Demo	B/209	164
Demo	B/650A	0
Demo	B/952	0
Demo	B/96	130
Total FY07		294
FY08 Adjust		
Demo	B/100	158
Demo	B/210	157
Demo	B/211	133
Demo	B/87	487
Demo	B/481	11
Demo	B/629	30
Total FY08		976
FY09 Adjust		
Demo	B/475	4,624
FY10 Adjust	None	0

FY11 Adjust	None	0
FY12 Adjust	None	0
FY13 Adjust		
Demo	B/51	73
Demo	B/130	746
Demo	B/179 Partial	162
Demo	B/185	109
Demo	B/355	140
Demo	B/421	115
Demo	B/462	474
Demo	B/526	459
Total FY13		2,278
FY14 Adjust	None	0
FY15 Adjust	None	0

FY16 Adjust		
Demo	B/120	421
Demo	B/197	1,250
Demo	B/464	290
Demo	B/473	323
Demo	B/490 Partial	62
Demo	B/902 Partial	68
Total FY16		2,414

FY17 Adjust		
Demo	B/97	28
Demo	B/134	273
Demo	B/244	27
Demo	B/346	5
Demo	B/405	69
Demo	B/422	391
Demo	B/452	635
Demo	B/455	0
Demo	B/528	38
Demo	B/652	0
Total FY17		1,466
FY18 Adjusts	None	0

D.9 RECAPITALIZATION & MODERNIZATION

A continuous process of recapitalization and modernization will ensure that facilities support programs meet the changing needs of the DOE's missions. Furthermore facilities must be modernized to meet new environmental, safety and heath requirements. The backlog of modernization costs are reported in the DOE FIMS system as Rehab and Improvement Costs (RIC). The RIC backlog is shown in Table 11. Before the proposed SC Infrastructure Initiative, General Plant Projects (GPP) was the primary funding source to meet these emerging needs. Chart D-1 shows the trend of the net GPP purchasing power. While the actual funding shows a slow increase the net purchasing power sharply declined from FY86 – FY01 although it leveled somewhat with a slower decrease from FY02 – FY07. This drop occurred during a time when few of the 50-60 year-old facilities were replaced, thus further increasing the need for modernization funds.

The proposed SC Infrastructure Initiative should significantly impact BNL's recapitalization and modernization needs. The initiative is further supported by additional funds consisting of the 2% MII funds, considerable DM reduction funds, and IGPP funds at approximately the same levels as the GPP it is replacing.

Chart D-1 GPP Trend- Net Purchasing Power

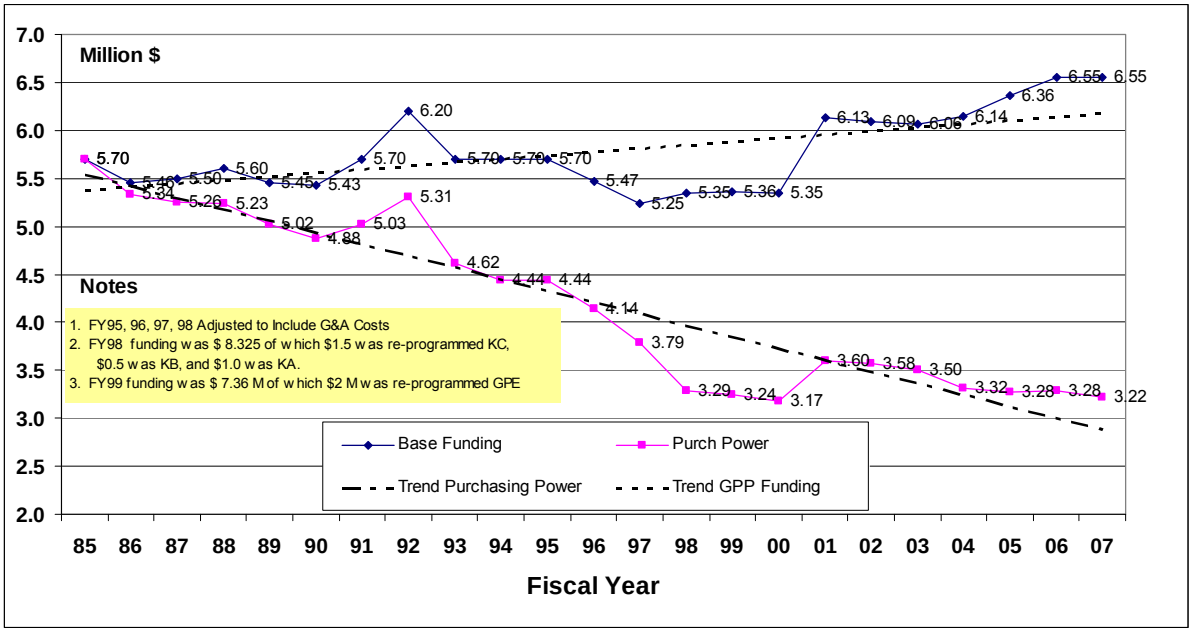


Table D-11 Rehab and Improvement Cost (RIC) Backlog, $M

PROGRAM	BUILDINGS	OSF
SC	150.6	55.5
EM	0.1	0.0

D.9.1 Institutional General Plant Projects (IGPP)

DOE Order 430.1B Attachment 6 defines the criteria for GPP projects. One stipulates that the program will have the contractor's Chief Financial Officer or Comptroller certify that

- Indirect funds will not be utilized for IGPP at the expense of maintenance or any other essential facilities program.
- The overall indirect budget will not increase to fund IGPP requirements; funds can be reallocated within the indirect budget for this.

Facing the additional requirements to fund maintenance and reduce deferred maintenance, BNL would have to significantly increase its overheads rates to generate additional funds for IGPP. However, DOE Order 430.1B does not allow this. The DOE-SC indicated that it can get this requirement rescinded. The two largest items funded out of overhead are maintenance and ES&H, neither of which could be cut without impacting other commitments. The DOE will need to resolve this issue prior to FY09, when IGPP is to be used by sites to replace landlord GPP.

BNL indicated in the IFI Crosscut those IGPP projects that complement and support the DOE-SC's Infrastructure Initiative. Proposed funding levels for IGPP will have approximately the same purchasing power as the GPP funding it is replacing.

D.9.2 Line Items

Few of BNL's 45-65 year-old scientific facilities have been replaced or modernized and most of the major lab/office buildings are approaching 50 years-old. As part of the DOE-SC Infrastructure Initiative, BNL proposed projects addressing the three main issues to implement the Site Master Plan objectives.

- Provide new modern interdisciplinary science space.
- Rehabilitate space in permanent buildings whose configuration supports modernization
- Demolish space over 65 year-old

Appendix 5 shows the requirements for line items.

D.9.3 General Plant Projects (GPP)

Appendix 4, the IFI Crosscut contains BNL's GPP plan modified from the IFI Crosscut and submitted with the budget, to reflect the funding targets provided in the TYSP's guidance. Consistent with the DOE-SC Infrastructure Initiative GPP funding is scheduled to end in FY08. Therefore, funding for program specific capital construction will be requested in future budget submissions.

D.10 SPACE BANK ANALYSIS

Table D-12 summarizes the planned additions and removals and their effect upon the space bank. Table D-13 details these additions and deletions. Most of the removals are associated with projects submitted as part of the DOE-SC Infrastructure Initiative. The analysis shows that banked space, in conjunction with space included in projects will be available to offset proposed new construction.

Included in the adjustment are approximately 485 ksf of waver space for the NSLS-II project. The current assumption is that existing NSLS facilities will be reconfigured for NSLS-II and other purposes that may allow some further consolidation out of 60-year old buildings. However, to fully reuse these facilities D&D of the existing accelerator will be required along with some alteration of existing space to facilitate reuse. The details of the NSLS space available for other use will not be known until this project further matures and its needs are more fully understood.

Table D-12 Space Bank Analysis, square feet (SF)

FY	A SF ADD	B SF REMOVE*	C SF CHANGE) (A-B)	D SF OFFSET SPACE (D-C)
06				181,414
07	72,347	479,448	(407,101)	588,515
08	106,200	35,095	71,105	517,410
09	22,000	24,736	(2,736)	520,146
10	5,000	0	5,000	515,146
11	14,000	0	14,000	501,146
12	4,000	0	4,000	497,146
13	102,500	120,193	(17,693)	514,839
14	0	0	0	514,839
15	475,000	0	475,000	39,839
16	97,000	100,260	(3,260)	43,099
17	85,000	106,495	(21,495)	64,594
18	0	0	0	64,594

Table D-13 Space Adjustments By FY, in square feet

FY07 Adjust		SF
Add	B/400	64,347
Add	B/817 Addn	8,000
FY07 Add		72,347
Waiver	MIT	156,790
Waiver	ETTP	301,433
Demo	B/209	14,164
Demo	B/650A	1,246
Demo	B/952	224
Demo	B/96	5,591
FY07 Subtract		479,448
FY08 Adjust		
Add	B/735	94,500
Add	MHF	9,300
Add	B/930 EBIS	2,400
FY08 Add		106,200
Demo	B/100	13,947
Demo	B/210	5,460
Demo	B/211	4,928
Demo	B/87	9,353
Demo	B/481	126
Demo	B/629	1,281
FY08 Subtract		35,095
FY09 Adjust		
Add	B/515 Addn	6,000
Add	B/600 Addn	16,000
FY09 Add		22,000
Demo	B/475	24,736
FY10 Adjust	None	
Add	B/463 Addn	3,000
Add	Main Gate Acc	2,000
FY10 Add		5,000
FY12 Adjust		
Add	B/488 Addn	4,000

FY13 Adjust		
Add	Guard Booths	200
Add	ISD I	93,000
Add	RHIC II	9,300
FY13 Add		102,500
Demo	B/51	12,377
Demo	Guard Booths	170
Demo	B/130	19,649
Demo	B/179 Partial	9,423
Demo	B/185	12,122
Demo	B/355	10,295
Demo	B/421	5,980
Demo	B/462	21,019
Demo	B/526	29,158
FY13 Subtract		120,193
FY15 Adjust		
Add	NSLS-II	425,000
Add	JPSI	50,000
FY15 Add		475,000
FY16 Adjust		
Add	ISD II	97,000
Demo	B/120	13,402
Demo	B/197	52,029
Demo	B/464	11,644
Demo	B/473	4,894
Demo	B/490 Partial	12,350
Demo	B/902 Partial	5,941
FY16 Subtract		100,260
FY17 Adjust		
Add	Shops I	85,000
Demo	B/97	3,755
Demo	B/134	30,593
Demo	B/244	11,342
Demo	B/346	282
Demo	B/405	3,969
Demo	B/422	15,595
Demo	B/452	31,010
Demo	B/455	787
Demo	B/528	6,662
Demo	B/652	2,500
FY17 Subtract		106,495

D.11 PERFORMANCE INDICATORS AND MEASURES

The following are the contract performance measures for FY07 that appear in Appendix B of the Laboratory's Prime Contract.

Performance Goal 7 Sustain Excellence in Operating, Maintaining, and Renewing the Facility and Infrastructure Portfolio to Meet Laboratory Needs
THE CONTRACTOR PROVIDES APPROPRIATE PLANNING FOR LABORATORY FACILITIES AND INFRASTRUCTURE NEEDS REQUIRED TO EFFICIENTLY AND EFFECTIVELY CARRY OUT CURRENT AND FUTURE S&T PROGRAMS, AND MANAGES DOE FACILITIES AND INFRASTRUCTURE IN A COST EFFECTIVE MANNER THAT ENSURES THEIR SAFE AND RELIABLE OPERATION CONSISTENT WITH PROGRAM MISSIONS NEEDS AND DOE STEWARDSHIP REQUIREMENTS.

The weight of this Performance Goal is 15%.

Performance Objective 7.1 - Manage Facilities and Infrastructure in an Efficient and Effective Manner that Optimizes Usage and Minimizes Life Cycle Costs

The weight of this Performance Objective is 50%.

Performance Measure 7.1.1
The management of real property assets to maintain effective operational safety, worker health, environmental protection and compliance, property preservation, and cost effectiveness while meeting program missions, through effective facility utilization, maintenance and budget execution

Performance Target 7.1.1.1 Maintain balanced priorities through effective utilization of the BNL Project, Planning, Programming and Budgeting Process (3PBP) project tracking and prioritization process. Have the Consolidated Unfunded Requirements List (CURL) funded projects approved by the BNL Policy Council in a timely manner.

Performance Measure 7.1.2
The maintenance and renewal of building systems, structures and components associated with the Laboratory's facility and land assets

Performance Target 7.1.2.1
BSA will maintain reliable electrical and building infrastructure. (Use existing infrastructure reliability index.)

Performance Target 7.1.2.2
The Laboratory's Maintenance Investment Index will meet DOE goals [e.g., MII ≥ 2.0].

Performance Target 7.1.2.3
The Laboratory's Deferred Maintenance Reduction expenditures will meet DOE proposed target for FY 2007.

Performance Objective 7.2 - Provide Planning for and Acquire the Facilities and Infrastructure Required to Support Future Laboratory Programs

The weight of this Performance Objective is 50%.

Performance Measure 7.2.1
Integration and alignment of the Ten Year Site Plan to the Laboratory's comprehensive strategic plan

Performance Target 7.2.1.1
BNL's Ten Year Site Plan is aligned with BNL's Business Plan. BNL's Project, Planning, Programming and Budgeting Process (3PBP) outcomes (e.g., projects approved by Policy Council) are aligned with BNL Business Plan. BNL will continue to study electric power supply options beyond the current three-year NYPA contract.

Performance Measure 7.2.2
Efficiency in meeting Cost and Schedule Performance Index for construction projects (when appropriate)

Performance Target 7.2.2.1
BSA manages Line Item and GPP projects effectively to agreed scope, schedule, obligation and cost baselines (Use existing Project Management Measure process.).

D.12 ENERGY AND SUSTAINABILITY MANAGEMENT

D.12.1 Approach to Energy Management at BNL

BNL established its Energy Management Group in 1979. They work to reduce BNL's energy use and costs by identifying and implementing cost-effective energy-efficiency projects, monitoring energy use and utility bills, and assisting in obtaining the least expensive sources of energy. The group also is responsible for developing, implementing, and coordinating BNL's Energy Management Plan and working with the DOE-BHSO to develop the Energy Performance Agreements.

BNL and the DOE-BHSO annually develop an Energy Performance Agreement to meet the requirements of the 2005 Energy Policy Act, Executive Order 13423, and the Transformational Energy Action Management Initiative recently announced by the DOE. However, some provisions will be difficult to achieve at individual sites. The guidance states the goals that are intended to be met using cost-effective measures; clearly, there will be circumstances where that will not be possible.

D.12.2 Energy Management Program at BNL and Coordination with Ten-Year Site Plan

There are several aggressive goals included in the guidance documents:

1. Achieve a 3% annual energy reduction per square foot goal from FY2006 – FY2015, for a total of 30%, as compared to 2003
2. Install electric metering in federal buildings by 2012
3. Design new buildings to 30% below AHSRAE standard unless proven to not be life-cycle close-effective
4. Achieve LEED Gold certification for all new buildings
5. Use electricity obtained from renewable sources

Most of them require capital investment and/or operating funds. Of particular concern is item no. 1, the 30% reduction in energy intensity for buildings and facilities. To achieve that goal, a significant investment in energy conservation projects is required. Based on BNL's past experience, and *assuming* acceptable pay-back projects can be identified, an investment in the range of $25 to $50 million or more will be needed over the next several years. Naturally, it would be nearly impossible to meet this requirement with existing budgets needed to achieve other infrastructure and ES&H goals. One option includes greater investment using IGPP, GPP, DMR, and other internal funds. Another less desirable option is the use of an Energy Savings Performance Contract (ESPC). An ESPC "may" provide a means to meet the goal, but will require a long-term commitment (~20 years). Moreover, an actual costs savings may not materialize and significant contractual oversight is required.

There are many previously identified energy conservation projects that may help meet the reduction goal. Many of these were not cost-effective at the time. These will be re-evaluated and implemented to the extent practical. The projects can be roughly grouped into the following:

• Lighting projects	$5,551,000
• Miscellaneous HVAC upgrades	$5,405,000
• Chemistry building ventilation upgrades	$600,000
Total	$11,556,000

Further, many other potential projects can be developed. However, a significant effort will be required in order to update those previously identified projects, and to develop new ones, so that reasonable estimates of Return on Investment (ROI) can be determined. They will be included in future updates.

However, we note that BNL's Ten-year Site Plan (TYSP) includes the demolition of old, inefficient wood-frame buildings, with the construction of new, modern, efficient ones. These actions will contribute towards meeting the energy reduction goals. The TYSP also involves replacing older, inefficient chillers and other cooling and heating equipment with more efficient units. While not specifically energy projects, the new chillers require less energy to operate.

BNL is continuing to evaluate a Combined Heat and Power (CHP) facility and a wind turbine project that would greatly reduce greenhouse gases and increase energy efficiency. Any project must be careful coordinated with other planned site development. Both of these potential projects, if determined to be economically viable, are long-term (20+ year contracts), and will be included as part of BNL's long-term planning. Both will be discussed in the TYSP, even if it is decided not to proceed with them.

Electric Metering

BNL's Energy Management Program requires that all new facilities have electric metering. Further, all of BNL's existing buildings, as defined by the Energy Policy Act, are metered, and meet the requirements without further investment.

Design of New Buildings to be 30% Below ASHARE Energy Standards

The designs of new building designs will attempt to meet this requirement. As the goal states, the design must be life-cycle cost effective, so that as many of the cost-effective design parameters that meet the economic criteria will be included.

Achieve LEED Gold certification for all new buildings

As is the case above, all designs will attempt to meet this requirement, again, where they are life-cycle cost-effective.

Requirement of renewable electricity consumption

Renewable energy options in the area around BNL are somewhat limited. However, several potential wind projects are being considered, and will be pursued if favorable. The energy supplied to BNL by the local utility meets the current 3% renewable requirements.

D.12.3 Dedication of BNL Resources for Energy Management Efforts

BNL has resources dedicated for energy management, including the energy-management group, with an annual budget of approximately $850,000. This budget includes maintaining and expanding the electric, chilled water, and steam metering systems. It also includes about $50,000 for implementing small, cost-effective energy projects.

Further, many of the DMR, GPP, and IGPP efforts include energy conservation components. Further efforts will prioritize the potential for energy conservation.

Table D-14 Operating Costs Energy

EPACT and E.O. 13423 Energy Reduction Requirements

EPACT 2005

Measure	Base FY03	Actual FY06	Target								
			FY07	FY08	FY09	FY10	FY11	FY12	FY13	FY14	FY15
Reduction @ 2% per yr	0	-8.2%	-2.0%	-4.0%	-6.1%	-8.2%	-10.4%	-12.6%	-14.9%	-17.2%	-19.5%
Btu/SF	324,950	298,199	318,451	311,822	305,060	298,164	291,129	283,954	276,635	269,169	261,555

Executive Order 13423

Measure	Base FY03	Actual FY06	Target								
			FY07	FY08	FY09	FY10	FY11	FY12	FY13	FY14	FY15
Reduction @ 3% per yr	**0**	-8.2%	-3.0%	-6.1%	-9.3%	-12.6%	-15.9%	-19.4%	-23.0%	-26.7%	-30.0%
Btu/SF	**324,950**	298,199	315,202	305,161	294,818	284,166	273,194	261,893	250,252	238,263	227,465

D.13 LEASING AND THIRD PARTY / NON FEDERAL FUNDED CONSTRUCTION OF NEW BUILDINGS

D.13.1 Leasing

BNL does not have any leases of 10,000 SF or above.

D.13.2 Third Party / Non-Federal Funded Construction of New Buildings

The following outlines BNL's proposed alternative-financed project that was proposed as part of the SC infrastructure Initiative:

Support Office Building

Purpose: Replaces the equivalent area of temporary wood-frame buildings, constructed by the US Army during WWII, that are past their economic and service life.

Scope: Construct a 55,000 sf office building for support staff.

Square Footage: 55,000

Total Estimated Cost: $40 Million

Status: Initial planning

Schedule: Occupancy 2017

D.14 OPERATING COSTS FOR SUSTAINMENT AND OPERATIONS

Table D-15 shows the sustainment and deferred maintenance reduction costs from FY07 to FY12. The space baseline was produced by analyzing the space additions and demolitions indicated in section D.10. Sustainment and operations costs are consistent with the IFI Crosscut Appendix 5. The DOE's targets are and continue to be met.

Table D-15 Operating Costs – Sustainment and DM Reduction ($/SF)

Sustainment and DMR Reduction	FY06	FY07	FY08	FY09	FY10	FY11	FY12
PE Maintenance Budget	20,063	20,930	22,222	23,111	24,035	24,996	25,996
Chargeback from non-Cap	1,590	1,601	1,707	1,775	1,846	1,920	1,997
Other Divisions Indirect Maintenance	548	546	569	592	614	639	664
Maintenance Projects	4,819	1,915	3,013	2,811	3,312	2,905	2,471
DMR Projects	-	2,458	7,163	10,447	13,730	13,730	13,730
Total Sustainment & DMR k$	27,020	27,450	34,674	38,736	43,537	44,190	44,858
Total SF	4,072,985	4,052,935	4,118,221	4,180,026	4,175,290	4,175,290	4,189,290
$/SF	6.63	6.77	8.42	9.27	10.43	10.58	10.71

Table D-16 shows the operating costs from FY07 to FY12. The space baseline was generated from analysis of space additions and demolitions indicated in section D.10. The operating costs were obtained from BNL's reported values for FY06 in FIMS. Future year costs were estimated using an inflation rate of 3.6%. Under this scenario, DOE targets are not met. The DOE-OECM Three-Year Rolling Timeline document does not offer any basis for this document to provide analysis. Issues such as regional labor cost adjusters, union labor vs. non-union labor, climate (for snow removal), regional waste disposal costs, % recycling desired are needed along with clearer definitions of what should be included under each category.

Table D-16 Operating Costs – Operating Costs ($/SF)

OPERATING COSTS	FY06	FY07	FY08	FY09	FY10	FY11	FY12
Grounds	4,133,963	4,282,786	4,445,532	4,614,462	4,789,812	4,971,825	5,160,754
Janitorial	5,577,511	5,778,301	5,997,877	6,225,796	6,462,376	6,707,947	6,962,849
Pest Control	261,112	270,512	280,791	291,462	302,537	314,033	325,967
Refuse	114,814	118,947	123,467	128,159	133,029	138,084	143,331
Recycling	165,143	171,088	177,589	184,338	191,343	198,614	206,161
Snow Removal	343,573	355,942	369,467	383,507	398,080	413,208	428,909
Total Operations Cost	10,596,116	10,977,576	11,394,724	11,827,724	12,277,177	12,743,710	13,227,971
Total SF	4,072,985	4,052,935	4,052,935	4,052,935	4,052,935	4,052,935	4,052,935
$/SF	2.60	2.71	2.81	2.92	3.03	3.14	3.26

APPENDIX 1
LAND USE PLAN

1.1 CURRENT LAND USE

The Laboratory site development has been influenced by the buildings and utilities inherited from the former Camp Upton. The general location and arrangement of the roads, buildings, and utilities are a legacy of the former army base. While the physical plant was gradually upgraded over the last 65+ years, many of the original Army elements still are used and will be considered in future planning.

To the north and west of BNL, the area is largely wooded, privately owned, and zoned for residential development. The area between Upton Road, William Floyd Parkway, and Princeton Avenue will remain as a buffer zone with forest and grassy areas. The anticipated expansion of major Laboratory buildings is to the east (NSLS-II), and in the RHIC area in the north central area of the site. BNL's holdings to the east are primarily woodlands and wetlands; plans are to leave them in their natural state for the foreseeable future. Part of this area was dedicated as the Upton Ecological Research Reserve. Conventional construction of the Center for Functional Nanomaterials is complete and the facility received beneficial occupancy. It is located on a formerly developed site. The Research Support Building has recently completed construction and is now fully occupied. The building is located in the site's core area, also on previously developed land. Therefore, there will be no impact on land use.

Most of BNL's principal facilities are located near the center of the site. The developed area is approximately 1,650 acres of which about 500 acres were originally developed by the Army. The various large specialized research facilities take up about 200 acres. Outlying facilities occupy about 550 acres; they include the sewage treatment plant, research agricultural fields, housing, and fire breaks. The balance of the site is largely wooded.

At present, 349 buildings are used with a total gross floor area of approximately 4.06 million square feet, of which 860,000 square feet is accelerator space. Two new buildings totaling 159,000 square feet, Building 400 "Research Support Building" and Building 735 "Center for Nanomaterials", have not yet been added to DOE's Facility Information Management System (FIMS) as the projects have not yet been closed out. Buildings 96, 650A, and 952 scheduled for demolition this year total approximately 7,000 square feet. Permanent buildings constructed since 1947 account for about 75% of the Laboratory's floor space. They are a 50-50 mix of concrete-block masonry and wood structures. Approximately 900,000 square feet are World War II wood structures and wood-frame postwar additions, currently used for housing. Building uses include the following:

- High-bay industrial type facilities with overhead cranes
- Research facilities for biomedical, chemical, physics, and laser users, and scientific and technical libraries
- Offices
- Fabrication facilities, including machine shops and craft shops
- Commercial facilities, including post office, bank, and gas station; and
- Recreational facilities, including swimming pool and gymnasium

BNL has a roadway system with 29 miles of paved roads and 14 miles of dirt and gravel roads. There are approximately 83 acres of paved areas, including approximately 4,000 parking spaces.

As a result of BNL's rich history, several areas and structures were identified as cultural resources, (i.e., historically significant). The BNL Cultural Resource Management Program is responsible for ensuring that the Laboratory fully complies with numerous cultural resource regulations. Three structures/sites were determined to be eligible for listing on the National Register of Historic Places: the World War I trenches associated with Camp Upton, the BGRR complex, and the HFBR complex.

Several networks of trench-warfare training earthworks are scattered through BNL's forests. One of the more distinct trench networks clearly follows the layout depicted in the 1919 Army Field Manual. Last used by many of the 30,000+ soldiers training at Camp Upton in 1918-1919, these BNL trenches may be among the few surviving examples of World War I earthworks in the United States.

The BGRR was the first nuclear reactor constructed to investigate the peaceful use of the atom. While much of the reactor structure will be dismantled as part of the decommissioning project, its historic significance has been preserved by making a video of its history and establishing records archive. The silver dome of the HFBR has been a distinct architectural landmark on the BNL site since the early 1960s.

Other cultural resources include the following: Buildings designed by renowned architects (Berkner Hall, and the Chemistry Building); house sites dating to the early 1800s; scientific equipment displays; unique scientific study areas (Gamma Forest site); and structures representative of the Civilian Conservation Corp era (Building 30) and WW II (Building 120). The Cultural Resources Program manages these and other culturally significant assets, so that they remain available for public and scholarly interpretation.

In March 2005 the DOE approved the Cultural Resource Management Plan (CRMP) that guides the management of all of the Laboratory's historical resources, was approved by the DOE. It is a living document that includes tasks and goals that are periodically assessed and revised. The CRMP identifies the Lab's historic resources, as well as specific management strategies and associated administrative processes to ensure compliance with regulatory requirements. These strategies, along with maps identifying sensitive cultural resource areas, are used to facilitate BNL's land-use planning processes. Aspects of the cultural resource strategies have also been integrated into various administrative planning tools.

The Land Use Planning process divides current land use into the following categories:

- Open space/wilderness - including protected wildlife and critical habitats, scenic vistas
- Industrial/commercial - e.g., research and development facilities, offices, manufacturing plants, rail yards, staging areas, power plants, utility systems, and waste management facilities
- Residential - e.g., permanent and temporary housing, dormitories
- Agricultural - e.g., farming, grazing, and aquaculture
- Recreational - including passive and active uses
- Native American - including traditional, cultural, and religious uses.

Four of the potential six categories were considered applicable for the BNL site; open space, industrial/commercial, agricultural, and residential. Figure E-1 shows them "zoned" into these categories.

1.1.1 Open Space

Open space encompasses approximately 75% of the site's area, which is mostly in its natural state, except for fire breaks, utilities' right of ways, recreation fields, and environmental monitoring wells and stations. This area includes floodplains and wetlands. These floodplain areas border the headwaters of the Peconic River in the northern area of the site, while the wetlands are predominantly in the BNL's eastern section. The Laboratory facilities, with the exception of portions of the RHIC ring, do not encroach on the one-hundred-year floodplains or wetlands. Some 30 species of mammals and 180 species of birds were recorded in the open spaces. The open space surrounding the developed central area of the site forms a buffer zone for the industrial/commercial land use areas.

1.1.2 Industrial/Commercial

The designated national user facilities—the Relativistic Heavy Ion Collider (RHIC), Alternating Gradient Synchrotron (AGS), National Synchrotron Light Source (NSLS), Tandem Van de Graaff, Accelerator Test Facility (ATF), Scanning Transmission Electron Microscope (STEM), and NASA Space Research Lab (NSRL) serve the scientific user community from both the United States and abroad and currently are the centerpieces of the industrial/commercial land use area. BNL has constructed an additional user facility, the Center for Functional Nanomaterials (CFN). Approximately 7.5 acres of the site is leased to the U.S. Department of Commerce for the NEXRAD weather radar facilities that are part of a National Weather Forecasting Network operated by the National Oceanic and Atmospheric Administration (NOAA). Other facilities housing scientific departments, scientific support divisions, and support divisions also lie within this industrial/commercial area. With the exception of the Sewage Treatment Plant and the Waste Management Facility, the industrial/commercial facilities form the site's developed central area.

The majority of the Laboratory's buildings are located in the industrial/commercial area. At present, 33 wooden buildings and 221 portable structures provide temporary space. Plans are to replace them with permanent facilities in the future. The existing facilities of the site's core area can broadly be characterized into four functional zones: support services, research machines, physical sciences laboratories, and life sciences laboratories. This functional layout was influenced by the layout of the basic infrastructure, utilities, and other services.

The U. S. Army initially constructed the infrastructure and utility systems now supporting the industrial/commercial functions as part of Camp Upton. Since 1947, the Laboratory has undertaken extensive additions and modernizations so that the systems meet the needs of the expanding and changing research programs. The utility systems consist of steam, chilled water, compressed air, potable and process water, sanitary and storm wastewater, electric power, and telecommunications.

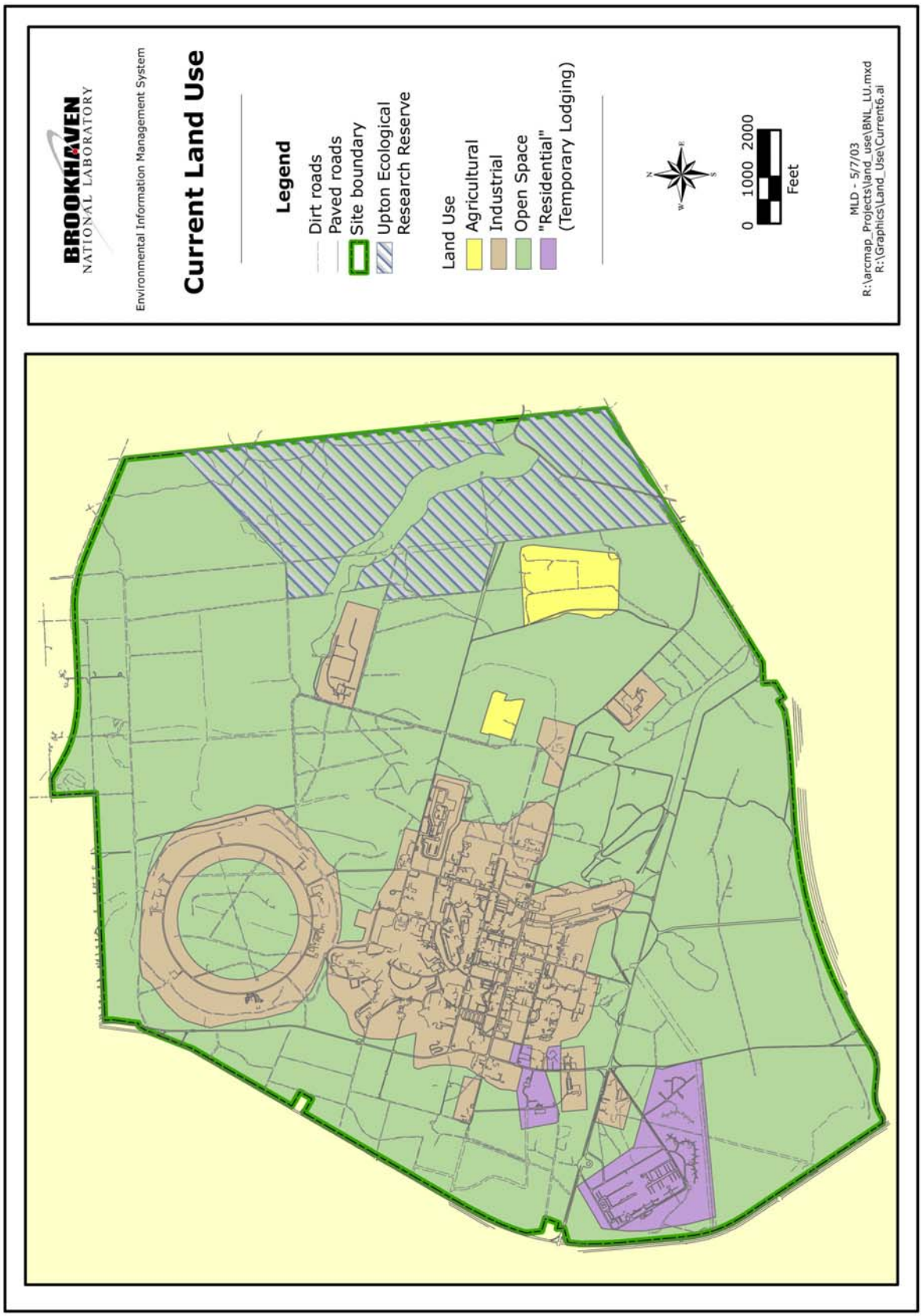


FIGURE E-1 Current Land Use

1.1.3 Agricultural

Approximately 70 acres of the site are used for growing crops, mainly corn, for biological research. However, other crops were grown in the past and are likely in the future; these are located in the eastern area of the site and are surrounded by natural vegetation and open space.

1.1.4 Residential

The housing inventory, largely inherited from the Army, is composed of summer cottages, apartments, efficiencies, guest rooms, dormitory rooms, and houses. Approximately 170 acres are designated for this purpose. The 26 wood buildings used for apartments, dormitory structures and the guest rooms are Army buildings converted for residential use. In addition, there are 30 summer cottages built in 1968. The bulk of this residential area lies in the southwest segment of the site. A natural growth of scrub oak and pine surrounds the residential complex which consists of the apartment area, cottages, efficiencies, and BNL's child development facility. The growth in research expected from CFN as a User facility and longer-term from NSLS-II and eRHIC, along with education programs and conference activity will support the need for adequate housing; however continued upgrade of existing facilities will be used to meet most of this need. Some additional housing is being considered in the vicinity of the NSLS-II to accommodate short-term users.

1.2 FUTURE LAND USE

The Laboratory's Site Master Plan, produced in 2000, and updated in 2004 identifies anticipated infrastructure needs. Scientific initiatives are identified in the BNL Strategic Plan, the Annual Laboratory Plan and the Office of Science Business Plan. Specific areas of the site were designated and are held in reserve for future programmatic and infrastructure development initiatives to ensure BNL remains aligned with DOE's vision for the future. Our planning efforts aim to optimize the physical plant to support the needs of BNL as a forefront scientific research institution. The planning process addresses the need for new facilities to meet emerging research needs while making maximum use of existing facilities and assets. Future land use is planned through program reviews, interaction with DOE, and input from staff, collaborators, and external stakeholders.

As part of developing this Master Plan, the Laboratory defined and prioritized sustainable development areas that will address the suitability for future development (Figure E-3). The Laboratory will continue to fulfill its mission of constructing and operating large experimental facilities that encourage the participation and support of the outside user communities (scientists and engineers from this country and abroad) to maintain U.S. pre-eminence in basic research. The planned research facilities, when built, will allow BNL to accommodate a substantially increased number of visitors and users.

It is BNL policy to minimize the generation of hazardous and radioactive wastes and the potential impacts of associated operations on the environment. Activities during the 1940s, 1950s and 1960s created several areas of environmental concern that are now being addressed. The process of systematically identifying and characterizing these areas for remedial actions has been ongoing for some time. These actions, which are part of our

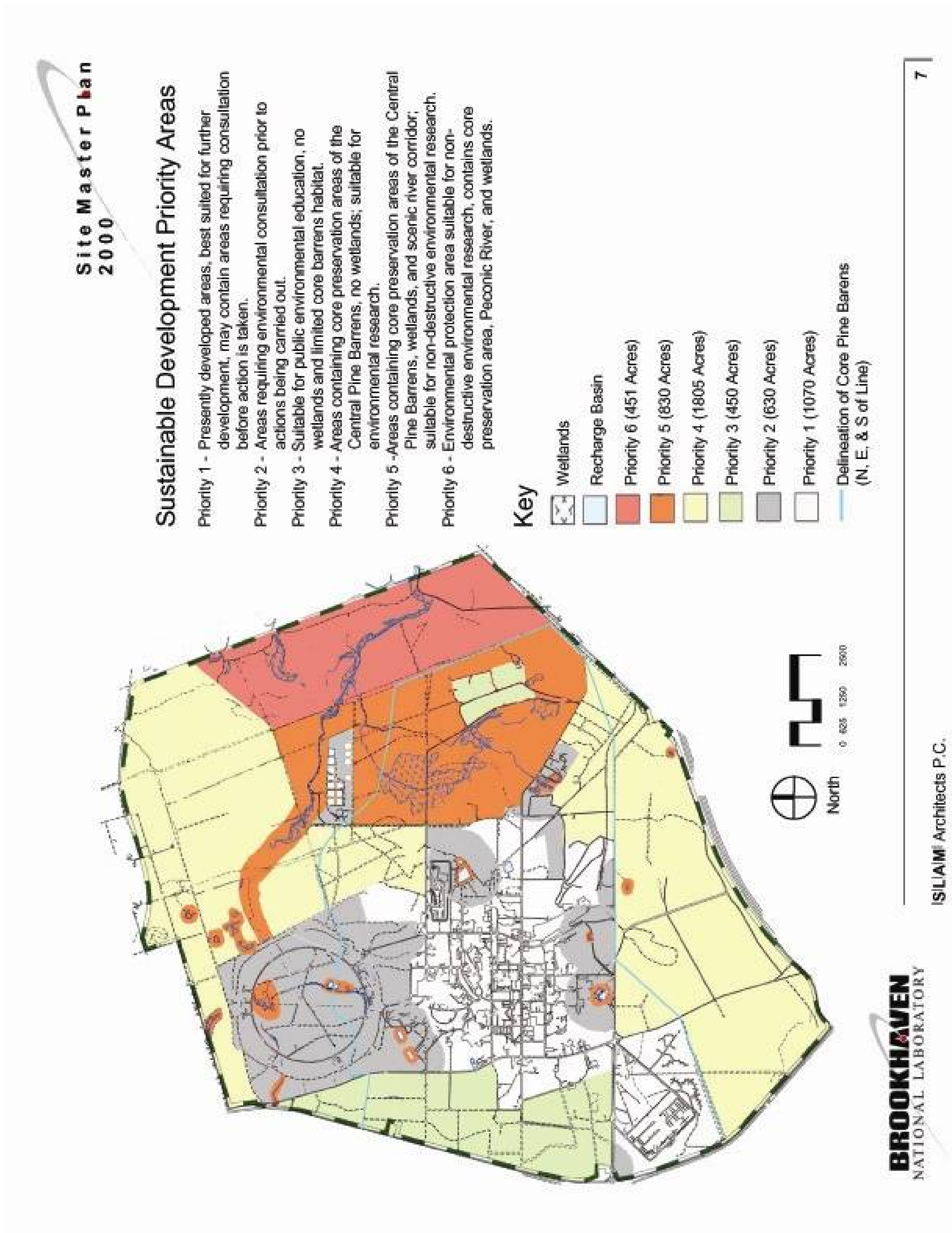


FIGURE E-2 Sustainable Development Priority Map

overall Environmental Restoration program, will influence the proposed future land uses for the site. Furthermore, BNL compiled a list of legacy environmental issues that are not part of the Environmental Restoration program. Several of them will restrict land use until they are cleaned up. It is and has been the Laboratory's policy to minimize the impact of development on the environment. The Laboratory's planning efforts consider the goals of the Pine Barrens Plan, the Special Groundwater Protection Plan, and the L.I. Comprehensive Wastewater Management Plan.

The Laboratory plans to preserve as much area as possible in its natural state while continuing its mission to support the DOE through leading-edge user research facilities, research and technology development, educational efforts, and industrial involvement. In November 2000, the DOE designated 530 acres of BNL's property as the Upton Ecological and Research Reserve so to protect the unique ecosystem of Pine Barrens forests and wetlands, and foster ecological research and educational opportunities.

The BNL site will continue to accommodate the Laboratory's scientific missions as currently envisioned for at least the next twenty years. The future development of the site is based on the continued need for large, complex research user facilities. BNL must continue to improve existing facilities to maintain state-of-the-art capability and is planning to build, during the next decade, the next generation of user facilities.

The facilities required to house these proposed and planned scientific initiatives will increase the Laboratory's developed areas. Figure E-3 depicts these future land use areas as industrial/commercial, open space, agricultural, and residential zones. Infrastructure must support the new research initiatives. Rehabilitation is planned for most utilities and some increases in plant capacity are needed.

1.2.1 Open Space

Open space, which includes the undeveloped areas, may be reduced 10-15% after constructing the scientific research facilities now under evaluation including the NSLS-II, JPSI, and the electron ring for the evolution of RHIC to a QCDLab at RHIC. Further land development may be required to accommodate a consolidated Plant Engineering Complex, proposed in the Site Master Plan. All remaining undeveloped areas should remain in their natural state. The floodplain areas are unlikely to be affected. Should any encroachment occur, plans to minimize impacts and accommodate exceptional events such as a "One-Hundred-Year" storm will be developed. Open space surrounding the RHIC mostly lies within the Peconic River Corridor. Any disturbances to the land would require permits from the New York State Department of Environmental Conservation (NYSDEC)

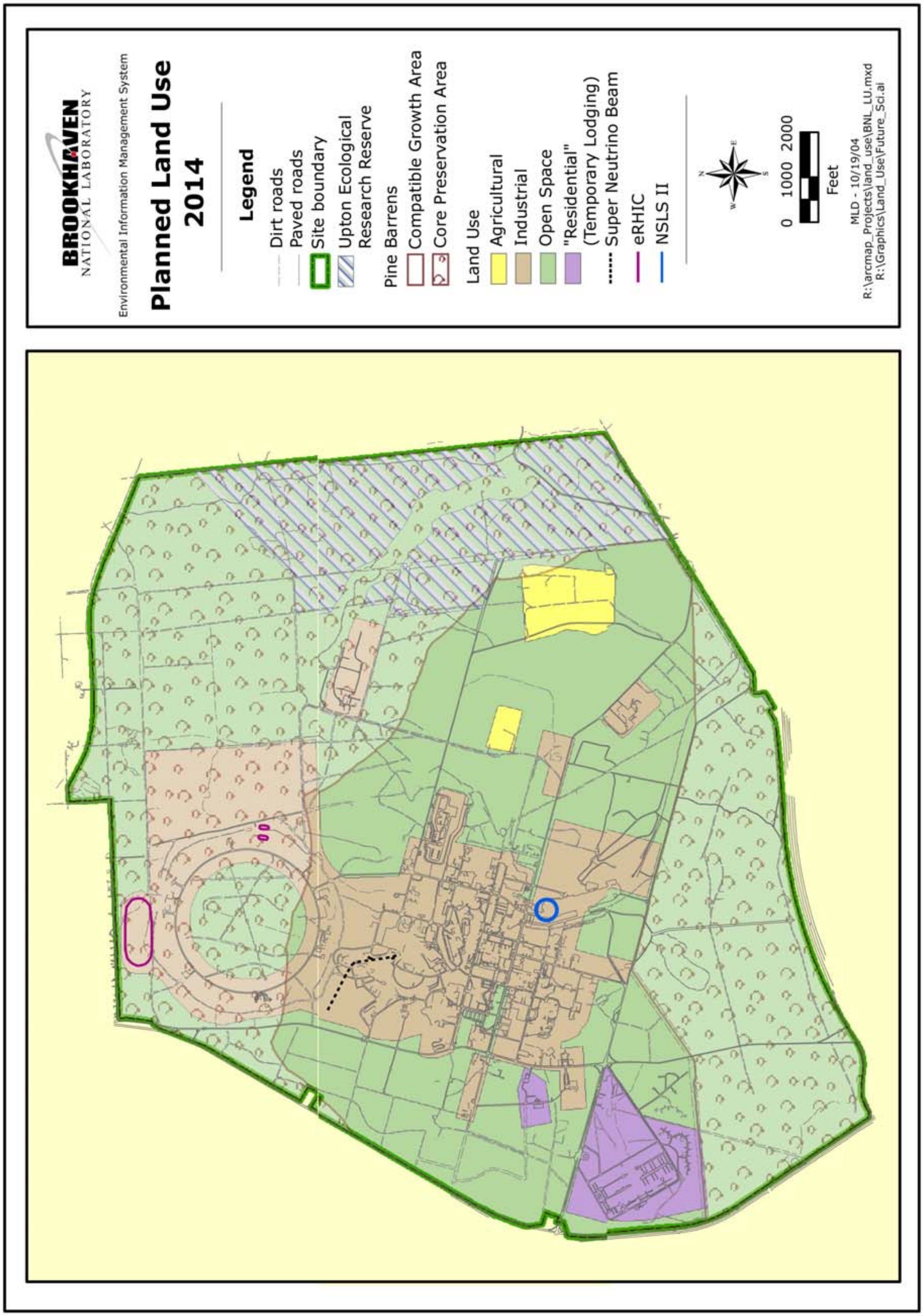


FIGURE E-3 Future Land Use

1.2.2 Industrial/Commercial

In the Industrial/Commercial Land Use category, specific areas are held in reserve for future programmatic and site development initiatives. In general, the areas to the north (RHIC expansion) and east (NSLS-II and JPSI) of the central developed area may the sites of future major research facilities. The Laboratory plans to construct new facilities and consolidate out of WWII ones into "program-centered" departmental and divisional complexes and several multi-disciplinary facilities. These complexes will be accommodated in the currently developed area containing the industrial/commercial facilities. It is anticipated that additional industrial/commercial-type facilities will be required for these new endeavors.

1.2.3 Agriculture

Approximately 70 acres, used by BNL's Biology Department for growing crops for research, will most likely remain as agricultural fields. No expansion of this use is anticipated.

1.2.4 Residential

BNL had considered seeking alternate-financing to construct replacement housing for its 65+ year old WW II apartment buildings and slightly increase its inventory. This would have resulted in further development in the site housing area, located in the southwest portion of the site. However, recent changes in OMB Circular A-11 and a drop in on-site occupancy caused the proposal to be no longer viable. BNL's current housing is expected to remain. In the future, as the housing impacts of new scientific initiatives, such as the Center for Functional Nanomaterials and the NSLS-II, are better understood new facilities, if needed, could be located on developed land near the existing housing area or in the area where the NSLS-II is being constructed.

APPENDIX 2
INVENTORY OF BUILDINGS & MAPS

This section contains an inventory of buildings showing the following information:

- Building Number (ID)
- Building Name (NAME)
- Owner Program Secretarial Office (OWNER)
- Mission Essential (ESN)
- Gross Square Feet (GROSS)
- Building Age (AGE)
- GSA Use Code (USE)
- Excess Status/Excess Year (EXCESS)
- Operational Status (STS)
- Current Replacement Plant Value (RPV)
- FY05 Deferred Maintenance (DM)
- FY05 Rehab and Improvements Cost (RHIC)

Also included is a map showing BNL's Buildings and Roads.

INVENTORY OF BUILDINGS

ID	NAME	PSO	ESN	GROSS	AGE	USE	STS	EXCESS	RPV	DM	RIC
0030	Brookhaven Center	SC	2	14,295	73	294	1	N	3,731,819	499,829	656,000
0050	Police Headquarters	SC	2	10,466	66	296	1	N	2,765,650	401,773	-
0051	Environmental Restoration	SC	2	12,377	73	101	1	N	2,932,633	73,010	-
0087	Excess Property Warehouse	SC	2	9,353	67	400	6	N	1,878,697	486,947	-
0096	Truck/Utility Storage	SC	3	5,591	66	400	4	Y	1,123,165	129,606	-
0097	Maintenance Management Center	SC	2	3,755	66	101	1	N	1,277,954	27,930	-
0100	Bulk Warehouse	SC	2	13,947	67	400	6	N	2,511,342	257,913	-
0120	ESH & Q Office Building	SC	2	13,402	65	101	1	N	3,442,983	420,694	-
0129	ITD,TFCU & Science Museum Staff Offices.	SC	2	10,107	65	101	1	N	3,043,901	183,421	-
0130	Engineering/Safety & Risk Technology	SC	2	19,649	66	101	1	N	4,274,409	745,938	300,000
0134	Plant Engine/CEGPA/Fiscal/Audit	SC	2	30,593	66	101	1	N	6,454,347	273,215	-
0153	Cavendish - Men's Residence	SC	2	18,308	66	300	1	N	4,648,710	220,486	-
0170	Compton - Men's Residence	SC	2	21,566	66	300	1	N	5,582,890	177,624	-
0179	Staff Services/EENS/Post Office	SC	2	15,025	66	101	1	N	3,358,683	161,861	-
0180	Fleming - Men's Residence	SC	2	17,038	66	300	1	N	4,712,496	312,459	-
0185	Human Resources/Diversity Office	SC	2	12,122	65	101	1	N	2,892,873	109,368	-
0197	NNSD/Graphic Arts/NNDC	SC	1	52,029	66	101	1	N	12,221,986	1,250,174	225,000
0210	Gases Warehouse	SC	2	5,460	62	410	6	N	1,097,533	156,846	-
0211	Procurement & Property Management	SC	2	4,928	66	101	6	N	1,480,231	132,196	-
0244	Carpenter/Lock & Paint Shop	SC	2	11,342	61	605	1	N	4,780,597	26,901	-
0257	Guest House	SC	2	5,919	64	300	1	N	1,080,811	167,046	-
0258	Curie - Women's Residence	SC	2	12,975	65	300	1	N	3,741,899	220,482	-
0302	Apartment 28	SC	2	4,731	61	300	1	N	652,463	80,372	-
0303	Apartment 34	SC	2	5,310	66	300	1	N	724,825	77,212	-
0304	Apartment Storage	SC	2	1,278	66	400	1	N	263,035	96,263	-
0306	Apartment 13	SC	2	4,073	66	300	2	N	551,180	66,977	-
0307	Apartment 11	SC	2	4,117	66	300	1	N	556,482	94,850	-
0317	Recreation Hall	SC	2	7,168	66	294	1	N	1,894,374	395,549	-
0321	Equipment Storage	SC	2	4,741	64	400	1	N	1,004,891	123,292	200,000
0325	Apartment 7	SC	2	4,191	64	300	1	N	607,061	68,316	-
0326	Site Maintenance Office	SC	2	8,150	64	101	1	N	2,196,952	133,954	-
0327	Apartment 24	SC	2	3,781	64	300	1	N	538,064	68,316	-
0328	Apartment 26	SC	2	2,481	64	300	1	N	357,265	36,993	-
0330	Apartment 8	SC	2	3,931	64	300	1	N	532,694	55,019	-
0331	Apartment 10	SC	2	4,088	64	300	2	N	579,270	55,523	-
0334	Apartment 30	SC	2	2,565	64	300	2	N	367,443	38,539	-

INVENTORY OF BUILDINGS

ID	NAME	PSO	ESN	GROSS	AGE	USE	STS	EXCESS	RPV	DM	RIC
0335	Apartment 36	SC	2	3,173	64	300	1	N	442,624	45,700	-
0339	Maintenance Storage	SC	2	4,408	67	400	1	N	942,159	98,972	-
0346	Storage	SC	2	282	61	421	1	N	55,851	4,688	-
0348	Calibrations	SC	2	7,595	64	704	1	N	3,225,654	301,835	-
0349	Apartment 2	SC	2	4,127	64	300	1	N	556,310	89,445	-
0350	Apartment 4	SC	2	4,144	64	300	1	N	558,355	89,475	-
0351	Apartment 6	SC	2	4,132	64	300	1	N	556,908	101,935	-
0355	Contracts & Procurements	SC	2	10,295	64	101	1	N	2,573,538	140,923	-
0356	Solid State Irradiation Facility	SC	1	4,391	64	765	1	N	1,765,291	223,515	-
0359	Apartment 5	SC	2	4,099	64	300	1	N	572,830	95,171	-
0360	Apartment 3	SC	2	4,087	64	300	1	N	574,935	102,562	-
0361	Apartment 1	SC	2	4,263	64	300	1	N	572,689	97,721	-
0362	Apartment 22	SC	2	4,502	64	300	1	N	607,054	103,561	-
0363	Coin Laundry	SC	2	3,216	64	691	1	N	827,390	154,688	-
0364	Apartment 40	SC	2	5,775	43	300	1	N	1,019,220	128,863	-
0365	Apartment 41	SC	2	5,773	43	300	1	N	848,331	123,253	-
0366	Apartment 42	SC	2	5,773	43	300	1	N	848,660	128,005	-
0367	Apartment 43	SC	2	5,067	43	300	1	N	899,443	120,252	-
0368-01	Summer Cottage	SC	2	1,072	39	300	1	N	189,874	1,043,925	-
0368-02	Summer Cottage	SC	2	1,072	39	300	1	N	189,874	512,758	-
0368-03	Summer Cottage	SC	2	1,003	39	300	1	N	177,723	514,723	-
0368-04	Summer Cottage	SC	2	1,003	39	300	1	N	177,723	11,163	-
0368-05	Summer Cottage	SC	2	1,085	39	300	1	N	192,163	11,163	-
0368-06	Summer Cottage	SC	2	995	39	300	1	N	176,314	11,163	-
0368-07	Summer Cottage	SC	2	1,003	39	300	1	N	177,723	11,163	-
0368-08	Summer Cottage	SC	2	1,003	39	300	1	N	177,723	11,163	-
0368-09	Summer Cottage	SC	2	1,085	39	300	1	N	192,163	11,163	-
0368-10	Summer Cottage	SC	2	995	39	300	1	N	176,314	11,163	-
0368-11	Summer Cottage	SC	2	1,072	39	300	1	N	189,874	11,163	-
0368-12	Summer Cottage	SC	2	995	39	300	1	N	176,314	11,163	-
0368-13	Summer Cottage	SC	2	995	39	300	1	N	176,314	11,163	-
0368-14	Summer Cottage	SC	2	995	39	300	1	N	176,314	11,163	-
0368-15	Summer Cottage	SC	2	1,072	39	300	1	N	189,874	11,163	-
0368-16	Summer Cottage	SC	2	995	39	300	1	N	176,314	11,163	-
0368-17	Summer Cottage	SC	2	995	39	300	1	N	176,314	11,163	-
0368-18	Summer Cottage	SC	2	995	39	300	1	N	176,314	11,163	-

INVENTORY OF BUILDINGS

ID	NAME	PSO	ESN	GROSS	AGE	USE	STS	EXCESS	RPV	DM	RIC
0368-19	Summer Cottage	SC	2	1,072	39	300	1	N	189,874	11,163	-
0368-20	Summer Cottage	SC	2	1,072	39	300	1	N	189,874	11,163	-
0368-21	Summer Cottage	SC	2	995	39	300	1	N	176,314	11,163	-
0368-22	Summer Cottage	SC	2	995	39	300	1	N	176,314	11,163	-
0368-23	Summer Cottage	SC	2	995	39	300	1	N	176,314	11,163	-
0368-24	Summer Cottage	SC	2	995	39	300	1	N	176,314	11,163	-
0368-25	Summer Cottage	SC	2	995	39	300	1	N	176,314	11,163	-
0368-26	Summer Cottage	SC	2	995	39	300	1	N	176,314	11,163	-
0368-27	Summer Cottage	SC	2	995	39	300	1	N	176,314	11,163	-
0368-28	Summer Cottage	SC	2	995	39	300	1	N	176,314	11,163	-
0368-29	Summer Cottage	SC	2	995	39	300	1	N	176,314	11,163	-
0368-30	Summer Cottage	SC	2	995	39	300	1	N	176,314	11,163	-
0370	Child Development Center	SC	2	1,127	31	234	1	N	398,380	-	-
0371	Brookhaven House	SC	2	3,213	23	300	1	N	578,148	65,177	-
0373	Child Care Facility	SC	2	8,283	16	234	1	N	2,058,110	27,895	-
0387	Park Shelter	SC	2	600	37	294	1	N	25,000	-	-
0388	Danish House	SC	2	4,821	22	300	1	N	841,993	1,334	-
0389	Environmental Monitoring Station P4	SC	2	114	60	769	1	N	20,076	-	-
0397	Salt Storage Bldg.	SC	2	4,197	10	400	1	N	384,219	-	-
0405	Building Storage	SC	2	3,969	45	400	1	N	808,781	69,857	-
0406	Site Storage	SC	2	1,781	46	400	1	N	350,930	42,195	-
0412	Site Storage	SC	2	2,031	64	400	1	N	435,355	30,809	-
0421	Structural Biology	SC	1	5,980	64	741	1	N	2,014,629	114,191	-
0422	Building Maintenance Office	SC	2	15,595	64	605	1	N	6,469,352	391,151	-
0423	Equip/Vehicle Repair	SC	2	14,275	64	621	1	N	4,515,926	232,549	-
0438	Science Education Center	SC	2	5,095	16	233	1	N	1,762,355	71,403	-
0449	Telephone & Data Eqpt-Node 1 & 2	SC	2	1,899	27	642	1	N	936,811	265,316	-
0452	Utilities Maintenance	SC	2	31,010	64	601	1	N	11,527,534	635,010	-
0455	Utilities Storage	SC	2	787	90	400	1	N	138,594	-	-
0459	Business Systems Division	SC	1	14,304	62	297	1	N	8,772,749	155,445	-
0460	Director's Office	SC	2	17,762	62	101	1	N	5,107,936	747,214	-
0461	Gymnasium	SC	2	13,243	62	295	1	N	3,781,563	342,378	-
0462	Central Shop - Sheet Metal Shop	SC	2	21,019	62	611	1	N	8,599,821	474,229	-
0463	Biology	SC	1	113,546	62	741	1	N	60,889,649	8,425,729	6,488,175
0464	DOE-BHSO Group Office	SC	2	11,644	62	101	1	N	3,083,623	289,968	-
0473	Electron Beam Weld	SC	2	4,894	65	603	1	N	2,563,910	322,743	-

INVENTORY OF BUILDINGS

ID	NAME	PSO	ESN	GROSS	AGE	USE	STS	EXCESS	RPV	DM	RIC
0475	Intellectual Prop/Energy Science & Tech	SC	2	24,736	61	101	6	N	5,814,096	4,624,267	-
0477	Research Library	SC	2	17,807	62	290	1	N	5,113,337	222,449	-
0478	Swimming Pool	SC	2	19,441	61	294	1	N	6,454,382	19,755	-
0479	Heavy Machine Shop	SC	2	33,926	61	611	1	N	14,107,019	630,315	425,000
0480	Materials Sciences	SC	1	40,786	61	703	1	N	11,615,676	734,804	-
0481	Sewage Pump House	SC	2	126	61	694	6	N	16,333	11,163	-
0486	Machine Shop Storage	SC	2	304	12	400	1	N	45,214	-	-
0487	Soil Analysis Building	SC	1	3,000	2	761	1	N	135,914	-	-
0488	Berkner Hall	SC	2	52,681	39	291	1	N	16,730,456	1,102,180	1,134,000
0490	Medical Research Center	SC	1	222,512	49	742	1	N	107,108,276	1,142,163	24,253,548
0491	Medical Research Reactor	SC	3	11,653	49	783	4	Y	6,814,750	39,070	-
0492	Well No. 105	SC	3	1,243	48	694	3	Y	328,512	-	-
0493	Video Work Area/Physical Training	SC	2	6,084	44	299	1	N	1,835,674	33,597	-
0494	BNL Records Holding Facility	SC	2	8,027	44	401	1	N	1,793,625	171,346	-
0495	Oil Drum Storage Facility	SC	2	660	17	410	1	N	117,840	-	-
0496	Storage	SC	2	6,000	45	400	1	N	1,181,781	10,918	-
0496A	Storage	SC	2	987	61	401	1	N	173,814	55,814	-
0497	Environmental Monitoring Station	SC	2	74	13	769	1	N	13,032	-	-
0498	Central Shops Cleaning Facility	SC	2	999	10	611	1	N	730,288	-	-
0510	Physics	SC	1	201,929	45	101	1	N	82,440,796	5,204,675	30,900,500
0515	Information Technology Division	SC	1	59,239	41	297	1	N	21,176,895	351,672	11,494,707
0516	Ground Water Pump Station (M.Rd.)	EM	2	396	6	694	1	N	69,737	-	-
0517	Ground Water Treatment Facility	EM	2	228	6	694	1	N	40,152	-	-
0518	Ground Water Treatment Facility	EM	2	228	10	694	1	N	40,152	-	-
0519	Ground Water Pumping Station	EM	2	277	10	694	1	N	48,781	-	-
0521	Air Sparge/Soil Vapor Extraction System	EM	2	1,814	13	694	1	N	319,452	-	-
0522	Compressed Natural Gas Fueling Facility	SC	2	326	6	651	1	N	493,564	-	-
0526	Energy Efficiency & Conservation	SC	1	29,158	64	703	1	N	14,017,733	458,969	-
0528	Electrical OPS / ECS Document Storage	SC	2	6,662	64	615	1	N	1,939,367	37,974	-
0535	Instrumentation Division	SC	1	76,911	43	731	1	N	43,741,322	752,296	8,979,955
0537	Telephone Equipment Node 5	SC	1	240	10	642	1	N	44,197	-	-
0539	WSB Ground Water Recovery Unit	EM	2	120	5	694	1	N	21,508	-	-
0555	Chemistry	SC	1	151,467	41	711	1	N	73,381,932	5,728,609	15,511,380
0560	High Field MRI Lab	SC	1	4,033	11	742	1	N	1,295,713	87,326	-
0562	Central Shops Sheet Metal Storage	SC	2	701	27	401	1	N	107,387	-	-
0563	Influent Measuring	SC	2	243	10	769	1	N	42,793	-	-

INVENTORY OF BUILDINGS

ID	NAME	PSO	ESN	GROSS	AGE	USE	STS	EXCESS	RPV	DM	RIC
0566	Blower Builing	SC	2	1,399	9	694	1	N	250,662	-	-
0569	STP Monitoring Station @MH 192	SC	2	77	19	769	1	N	11,984	-	-
0570	Weapons Range Equip. Storage	SC	2	212	27	401	1	N	37,334	-	-
0571	Storage Shed	SC	2	48	10	450	1	N	8,453	-	-
0573	Hypochlorite Storage Building	SC	1	180	65	400	1	N	31,699	-	-
0575	Sewage Treatment Facility	SC	1	2,344	40	694	1	N	511,260	37,302	100,000
0580	U.V. Disinfection Discharge	SC	1	514	65	694	1	N	206,714	-	-
0581	Equipment Storage	SC	2	396	65	400	1	N	69,737	33,488	-
0589	Storage Shed	SC	2	60	10	450	1	N	10,566	-	-
0590	Environmental Monitoring Station P2	SC	2	129	13	769	1	N	22,717	-	-
0591	Environmental Monitoring Station P9	SC	2	113	13	769	1	N	19,900	-	-
0592	Environmental Monitoring Station P5	SC	2	120	60	761	1	N	21,132	-	-
0593	Environmental Monitoring Station S6	SC	2	217	60	769	1	N	38,214	-	-
0593A	Environmental Monitoring Storage Shed	SC	2	283	13	769	1	N	49,837	-	-
0594	Environmental Monitoring Station P7	SC	2	114	60	769	1	N	20,076	-	-
0595	Environmental Monitoring Station HMn	SC	2	74	13	769	1	N	13,032	-	-
0596	Environmental Monitoring Station HMs	SC	2	74	13	769	1	N	13,032	-	-
0597	Environmental Monitoring Station HQ	SC	2	60	13	769	1	N	10,566	-	-
0598	Ground Water Treatment Plant	EM	2	761	9	591	1	N	131,497	-	-
0599	Fire House	SC	2	12,148	22	693	1	N	2,953,996	293,504	130,000
0600	Chilled Water Facility	SC	1	12,778	17	694	1	N	2,550,886	816,505	1,976,000
0603	69 kV Sub-Switchgear Bldg	SC	1	4,567	58	694	1	N	830,041	106,254	-
0610	Central Steam Facility	SC	1	15,946	58	694	1	N	4,035,384	1,186,935	215,000
0614	Well No. 4	SC	1	519	47	694	1	N	91,398	14,065	-
0618	Well No. 6	SC	1	608	42	694	1	N	107,071	12,342	-
0619	Well No. 7	SC	1	607	42	694	1	N	106,895	-	-
0624	Water Treatment Facility	SC	1	5,985	42	694	1	N	1,092,737	148,587	-
0629	Emergency Power Facility	SC	3	1,281	39	694	4	Y	690,799	30,102	-
0630	Public Service Station	SC	2	2,381	41	651	1	N	1,426,696	68,380	135,000
0631	AGS 69 kV Sub-Switchgear Bldg	SC	1	2,427	39	694	1	N	435,305	6,254	-
0634	Well No. 10	SC	1	684	28	694	1	N	204,588	22,798	-
0635	Well No. 11	SC	1	680	25	694	1	N	203,883	15,300	-
0636	Fuel Pump House	SC	2	1,415	25	694	1	N	261,285	-	-
0637	Well No. 12	SC	1	680	22	694	1	N	205,994	15,300	-
0638	RHIC 69kV Switchgear	SC	1	1,857	9	694	1	N	321,395	-	-
0639	Fuel Receiving/Transfer Facility	SC	1	7,916	11	694	1	N	1,529,742	-	-

INVENTORY OF BUILDINGS

ID	NAME	PSO	ESN	GROSS	AGE	USE	STS	EXCESS	RPV	DM	RIC
0641	Water Filter Building	SC	1	5,716	21	694	1	N	963,979	40,962	-
0642	Equip. Storage Water Treatment Facility	SC	1	202	21	400	1	N	29,719	-	-
0645	Well Control House	EM	2	64	10	694	1	N	11,271	-	-
0646	Air-Stripping & Pump House	SC	2	1,163	13	599	1	N	192,360	-	-
0650	Custodial Storage	SC	3	12,408	48	692	4	Y	2,805,701	47,883	-
0650A	Storage	SC	3	1,246	66	401	4	Y	452,661	-	-
0650T	Construction Group	SC	2	1,985	17	101	1	N	714,673	16,744	-
0651	Fuel Off-Loading Facility	SC	1	2,092	10	591	1	N	353,478	-	-
0652	Man Lift Garage/Equip. Storage	SC	2	2,500	18	450	1	N	104,467	-	-
0654	Well #10-Carbon Filter Bldg.	SC	1	1,020	15	694	1	N	179,626	-	-
0655	Well #11-Carbon Filter Bldg.	SC	1	999	15	694	1	N	176,303	-	-
0657	Well #12-Carbon Filter Bldg.	SC	1	1,020	14	694	1	N	179,626	-	-
0659	Chilled Water Storage Pump House	SC	1	1,241	11	599	1	N	199,782	-	-
0670	SR-90 Pilot Ground Water Treatment	EM	2	1,507	4	694	1	N	241,513	-	-
0680	West Gate Booth	SC	2	96	47	641	1	N	98,938	-	2,480,000
0680A	Visitors Gate Guard Booth	SC	2	74	47	641	1	N	77,498	-	-
0680B	Truck Inspection Booth	SC	3	17	9	641	1	N	17,804	-	-
0680C	Airport Bus Stop	SC	3	66	35	292	1	N	40,813	-	-
0701	BGRR Project Offices	EM	2	38,641	58	783	6	N	7,530,213	22,326	60,000
0703	Lab/Office Building	SC	1	84,525	58	791	1	N	44,232,940	4,924,048	2,557,445
0704	Fan House	EM	3	9,864	58	784	4	Y	447,876	-	-
0725	National Synchrotron Light Source	SC	1	155,689	26	785	1	N	71,979,893	245,283	3,067,000
0726	NSLS Mech Tech Supply Facility	SC	2	3,519	25	551	1	N	691,283	36,459	-
0727	NSLS Mechanical/Magnet Measurement	SC	2	4,000	25	551	1	N	912,970	-	-
0728M	NSLS Ofiice Building	SC	2	3,662	28	101	1	N	1,160,377	13,077	-
0729	NSLS Source Development Laboratory	SC	1	8,018	14	721	1	N	1,619,658	533,345	-
0750	High Flux Beam Reactor	EM	3	117,790	43	783	6	N	43,139,158	-	-
0751	Cold Neutron Facility	EM	2	2,141	37	792	2	N	572,562	-	-
0754	Emergencey Operations Facility	SC	2	2,121	19	101	1	N	3,778,293	-	-
0801	Isotope Research and Processing	SC	1	51,056	57	782	1	N	37,656,775	156,655	100,000
0802	Fan House	EM	2	1,282	57	694	1	N	361,693	-	-
0810	Liquid Waste Transfer	SC	2	1,087	6	591	1	N	157,842	-	-
0811	Waste Concentration Facility	SC	3	1,906	57	592	4	N	348,927	33,488	-
0815	EENS Multiprogram Laboratory	SC	1	64,228	46	703	1	N	34,165,367	1,540,733	6,411,154
0817	Engineering Support Facility	SC	2	8,828	12	101	1	N	2,417,793	15,673	1,928,000
0820	ATF / Vacuum Group	SC	1	29,507	50	703	1	N	16,133,790	162,369	-

INVENTORY OF BUILDINGS

ID	NAME	PSO	ESN	GROSS	AGE	USE	STS	EXCESS	RPV	DM	RIC
0820B	ATF Storage Facility	SC	2	726	50	401	1	N	112,010	16,744	-
0821	Heat Transfer/Fluid Dyn Storage	SC	2	463	29	401	1	N	70,394	-	-
0830	Environmental Waste Technical Center	SC	1	28,946	45	792	1	N	14,523,247	1,022,691	2,227,054
0832	Phenix Assembly Building	SC	2	8,180	11	551	1	N	1,909,967	-	-
0835	CAD Warehouse	SC	2	7,115	45	401	1	N	1,472,584	202,029	-
0836	Thermal Distribution Research Facility	SC	1	1,021	23	703	1	N	188,261	2,203	-
0839	Environmental Monitoring Station	SC	2	75	13	769	1	N	13,208	-	-
0855	WMF-RCRA	SC	2	27,474	9	591	1	N	4,390,535	-	-
0860	WMF-Operations	SC	2	12,364	9	101	1	N	3,110,841	-	-
0865	WMF-Reclamation	SC	2	20,886	9	593	1	N	3,718,164	87,805	-
0870	WMF-Mixed Waste	SC	2	6,888	9	593	1	N	1,459,000	1,805	-
0899	Storage Building	SC	2	338	58	400	1	N	50,481	-	-
0901	Radioisotope and Radiotracer C	SC	1	34,301	58	712	1	N	18,349,406	555,635	-
0901A	Van De Graaff Building	SC	1	65,611	39	785	1	N	35,535,588	470,761	-
0902	Magnet Division	SC	1	135,745	58	551	1	N	43,766,644	1,719,130	9,072,543
0904	Electricians Work Area	SC	2	1,769	51	612	1	N	838,379	116,683	-
0905	Magnet Assembly	SC	1	28,408	48	551	1	N	9,972,879	180,413	-
0906	PET Imaging Laboratory	SC	1	4,805	26	742	1	N	1,582,927	191,729	-
0907	Heavy Ion Power Supply A	SC	1	1,944	19	785	1	N	352,374	48,947	-
0908	Heavy Ion Power Supply B	SC	1	660	19	785	1	N	102,935	17,990	-
0909	Heavy Ion Beam Tunnel	SC	1	13,161	22	785	1	N	8,645,788	37,971	-
0911	Office/Service Building	SC	1	100,663	51	101	1	N	51,976,624	4,334,058	17,530,219
0912	AGS Experimental Halls	SC	1	184,870	49	724	1	N	32,450,458	1,676,129	2,100,000
0912A	Mechanical Equipment Building	SC	1	5,864	50	785	1	N	1,239,965	27,078	-
0913	AGS Tunnel	SC	1	47,891	50	785	1	N	30,214,406	510,975	-
0913A	Fan House A - Northeast	SC	1	664	50	785	1	N	118,440	13,771	-
0913B	Fan House B - North	SC	1	654	50	785	1	N	116,679	13,564	-
0913C	Fan House C - Northweat	SC	1	1,632	50	785	1	N	453,326	89,339	-
0913D	Fan House D - Southwest	SC	1	662	50	785	1	N	118,088	13,730	-
0913E	Fan House E - Southwest	SC	1	671	50	785	1	N	119,673	13,482	-
0913F	Proton House D18	SC	1	401	23	785	1	N	82,588	-	-
0913G	Proton House E18	SC	1	401	23	785	1	N	72,322	-	-
0913H	Proton House F18	SC	1	401	23	785	1	N	72,506	-	-
0913I	Proton House G18	SC	1	400	23	785	1	N	71,677	-	-
0913J	Proton House H18	SC	1	402	23	785	1	N	72,030	-	-
0913K	Proton House I18	SC	1	401	23	785	1	N	71,853	-	-

INVENTORY OF BUILDINGS

ID	NAME	PSO	ESN	GROSS	AGE	USE	STS	EXCESS	RPV	DM	RIC
0913L	Proton House J18	SC	1	402	23	785	1	N	72,030	-	-
0913M	Proton House K18	SC	1	401	23	785	1	N	71,853	-	-
0913N	Proton House L18	SC	1	401	23	785	1	N	70,955	-	-
0913O	Proton House L18A	SC	1	1,042	17	785	1	N	360,458	-	-
0913P	Proton House A18	SC	1	401	23	785	1	N	71,853	-	-
0913Q	Proton House B18	SC	1	401	23	785	1	N	72,424	-	-
0913R	Proton House C18	SC	1	402	23	785	1	N	72,030	-	-
0913S	H-10 Equipment House	SC	1	1,828	13	785	1	N	330,424	-	-
0913T	Storage	SC	2	1,075	28	401	1	N	209,619	-	-
0914	Booster Equipment	SC	1	8,614	49	785	1	N	1,862,490	208,744	-
0916	AGS Well 102	SC	1	404	49	785	1	N	71,146	7,058	-
0918	AGS Warehouse	SC	1	16,526	49	401	1	N	2,891,294	45,057	-
0919	G-2 Experiment Group	SC	1	16,463	45	785	1	N	3,319,854	160,405	-
0919A	AGS Crogenics/Target Group	SC	1	4,876	43	601	1	N	1,011,202	80,742	-
0919B	Works Building	SC	1	8,234	41	601	1	N	1,734,088	110,948	-
0919C	G-2 Plan-B Refrigerator Room	SC	1	1,066	40	785	1	N	171,110	-	-
0919G	G-2 R&D Refrigerator Room	SC	1	983	17	785	1	N	156,814	7,142	-
0919H	PTR Rect.House #1	SC	1	992	9	785	1	N	198,896	73,300	-
0919I	PTR Rect.House #2	SC	1	527	9	785	1	N	81,694	11,163	-
0919J	PTR Rect.House #3	SC	1	810	9	785	1	N	127,482	16,744	-
0920	E-10 Power Building	SC	1	1,525	36	785	1	N	415,148	-	-
0921	Exp. Power Supply Bldg. G-2	SC	1	3,903	44	724	1	N	710,721	220,073	-
0922	Scientific Assembly	SC	2	15,238	44	551	1	N	2,919,122	79,098	-
0923	Electronic Equipment Repair	SC	2	11,511	43	612	1	N	2,296,424	176,051	-
0924	RHIC-Magnet Production/Assembly	SC	2	19,162	39	551	1	N	3,430,119	112,844	-
0925	Works Building	SC	1	6,814	40	551	1	N	1,273,013	86,825	-
0926	Receiving/Warehouse	SC	2	10,091	39	401	1	N	1,821,959	235,988	-
0927	N. Experimental Tunnel	SC	1	1,236	36	785	1	N	10,888,817	16,744	-
0928	Siemens MG Power Supply	SC	1	18,086	38	785	1	N	3,490,830	515,696	-
0929	RF Power Supply	SC	1	13,471	38	785	1	N	2,837,851	128,800	-
0930	200 Mev Linac	SC	1	103,647	38	785	1	N	15,793,736	2,001,163	-
0931	BLIP	SC	1	2,066	36	792	1	N	394,200	245,024	-
0932	F-10 House Equipment	SC	1	1,737	36	785	1	N	446,465	22,326	-
0933	Site Maintenance Riggers Shop	SC	2	2,380	48	601	1	N	658,373	15,047	-
0933A	Site Maintenance Riggers Supervisor	SC	2	937	27	101	1	N	146,252	3,245	-
0934A	Site Maintenance Riggers Storage	SC	2	1,179	30	400	1	N	187,050	5,581	-

INVENTORY OF BUILDINGS

ID	NAME	PSO	ESN	GROSS	AGE	USE	STS	EXCESS	RPV	DM	RIC
0935	Science Museum	SC	2	5,850	27	293	1	N	1,255,124	6,154	-
0936	Equipment Storage	SC	2	4,049	27	401	1	N	773,132	2,791	-
0937	Radiation Effects Tunnel	SC	2	2,799	21	412	1	N	585,870	-	-
0938	Radiation Effects Facility	SC	2	5,272	21	101	1	N	1,176,896	7,175	-
0939	C-A / R & D Laboratory	SC	2	15,842	19	785	1	N	7,769,421	-	-
0940	On-Line Data Facility	SC	2	2,420	27	297	1	N	363,251	-	-
0941	Power Supply & Support Building	SC	1	1,362	17	785	1	N	209,375	-	-
0942	AGS Booster Tunnel	SC	1	12,197	20	785	1	N	6,993,860	-	-
0943	Magnet Test Control Room	SC	2	1,121	29	297	1	N	175,032	-	-
0944	Magnet Power Supply	SC	2	984	27	785	1	N	151,190	-	-
0945	High Bay Facility	SC	2	4,068	27	551	1	N	836,877	37,128	-
0946	Beam Stop Pump House	SC	2	324	19	785	1	N	62,971	-	-
0947	Environmental Monitoring Station	SC	2	75	13	769	1	N	13,208	-	-
0948	Pump House	SC	2	544	11	785	1	N	115,029	-	-
0949	G -2 Tunnel	SC	1	4,474	11	785	1	N	1,590,232	-	-
0950	Vacuum Pump House	SC	2	141	19	785	1	N	27,404	-	-
0951	Tower Equipment - T.E.Building	SC	2	657	55	401	1	N	140,444	6,305	-
0952	Storage	SC	3	224	20	401	4	Y	47,553	-	-
0953	Rectifier House A	SC	1	654	9	785	1	N	127,108	1,892	-
0954	Electrical Utilities	SC	1	217	13	731	1	N	42,175	-	-
0956	NSRL Beam Tunnel	SC	1	4,829	6	785	1	N	3,923,848	-	-
0957	NSRL Equipment Building	SC	1	5,160	6	694	1	N	1,033,556	-	-
0958	NASA Space Radiation Laboratory	SC	1	4,554	6	742	1	N	2,851,641	-	-
0959	Environmental Monitoring Station	SC	2	75	13	769	1	N	13,208	-	-
0964	Storage	SC	2	526	35	401	1	N	103,796	-	-
0966	E-Cooling R & D Facility	SC	2	1,197	24	297	1	N	188,981	-	-
0975	Machine Shop/SPS	SC	2	5,959	39	611	1	N	1,170,409	231,556	-
1000	RHIC Tunnel	SC	1	256,548	26	785	1	N	43,702,273	225,930	-
1000P	W-Line Power Supply Building	SC	1	2,484	26	785	1	N	439,917	-	-
1002	Brahms Experimental Hall	SC	1	4,948	26	724	1	N	1,168,548	-	-
1002A	Instrumentation/Brahms Service	SC	1	4,117	26	785	1	N	790,344	65,754	-
1002B	2 O'Clock Cryo Service Building	SC	1	3,267	9	785	1	N	627,515	-	-
1002C	Fast Electronics Hut	SC	2	504	9	785	1	N	80,767	415	-
1002D	Brahms Counting House	SC	2	1,134	9	724	1	N	413,040	27,907	-
1004A	RHIC RF Support Building	SC	1	6,270	26	785	1	N	1,314,433	59,378	-
1004B	4 O'Clock Cryo/Main Power Supply	SC	1	5,927	13	785	1	N	1,157,576	-	-

INVENTORY OF BUILDINGS

ID	NAME	PSO	ESN	GROSS	AGE	USE	STS	EXCESS	RPV	DM	RIC
1005E	East Ejection Power Supply	SC	1	5,539	26	785	1	N	1,211,515	260,149	-
1005H	RHIC Facility Compress Bldg	SC	1	12,063	26	785	1	N	2,420,932	53,434	-
1005P	Cooling Tower No. 7 Pump House	SC	1	989	9	785	1	N	174,166	600	-
1005R	Cryogenics Refrigerator Wing	SC	1	14,459	9	785	1	N	2,645,092	268,809	-
1005S	Collider Center	SC	2	40,791	26	101	1	N	12,621,459	393,667	-
1006	Star Experimental Hall	SC	1	16,801	26	724	1	N	4,088,975	218,009	-
1006A	Star Service Building	SC	1	4,489	26	785	1	N	883,856	92,643	-
1006B	6 O' Clock Cryo Service Building	SC	1	3,245	13	785	1	N	613,978	-	-
1006C	Star Counting House	SC	2	1,838	11	724	1	N	668,666	-	-
1006D	Office Modulars	SC	2	1,432	8	101	1	N	522,469	1,730	-
1007W	West Ejection Power Supply	SC	1	5,000	26	785	1	N	959,486	156,098	-
1008	Phenix Experimental Hall	SC	1	11,874	26	724	1	N	3,513,335	117,363	-
1008A	Phenix Service Building	SC	1	9,848	26	785	1	N	1,964,554	131,690	-
1008B	Service Bldg.	SC	1	4,007	13	785	1	N	771,419	-	-
1008C	Phenix Counting House	SC	1	1,163	10	724	1	N	421,870	-	-
1008E	Office Modular	SC	2	4,276	8	101	1	N	1,328,852	7,651	-
1008F	Mixing Building	SC	1	787	7	785	1	N	137,288	-	-
1010	Phobos Experimental Hall	SC	1	8,501	9	724	1	N	2,069,405	-	-
1010A	10 O'Clock Cryo/Phobos Service	SC	1	6,539	9	785	1	N	1,257,115	-	-
1010B	Phobos Counting House	SC	1	1,137	9	724	1	N	416,228	-	-
1012	Future Facility/Experimental	SC	1	8,818	9	785	1	N	3,707,511	-	-
1012A	12 O'Clock Cryo/Polarimeter Service	SC	1	6,492	9	785	1	N	1,247,439	-	-
1013	Equipment Storage	SC	2	202	10	401	1	N	29,719	-	-
1070	Environmental Monitoring Station	SC	2	75	13	769	1	N	13,208	-	-
1101	CAD Warehouse	SC	2	2,490	26	401	1	N	1,025,576	-	-

APPENDIX 3

INVENTORY OF OTHER STRUCTURES & FACILITIES (OSF)

This section contains an inventory of OSF showing the following information:

- Owner Program Secretarial Office (PSO)
- OSF Identifier (ID)
- OSF Name (NAME)
- Mission Essential (ESN)
- Current Replacement Plant Value (RPV)
- GSA Use Code (USE)
- Excess Status/Excess Year (EXCESS)
- FY05 Deferred Maintenance (DM)
- FY05 Rehab and Improvements Cost (RHIC)
- BNL Type (OSF Type)

Also included are maps showing the following utilities:

- Electrical Utilities
    - 13.8 kV and above Electrical Distribution
    - 2.4 kV and below Electrical Distribution
    - Communications
- Mechanical utilities
    - Central Steam System Distribution
    - Central Chilled Water Distribution
    - Potable Water Distribution
    - Sanitary Collection System
    - Storm Water Collection System
    - Gas Distribution
    - Non-Potable Water Distribution
    - Off-Gas Collection System

INVENTORY OF OSF

ID	NAME	PSO	ESN	RPV	USE	EXCESS	DM	RIC	TYPE
6250555	Chemistry (B/555)	SC	1	31,228	4322	N -	-	-	Utilities - Steam
610-BLR001A	Boiler 1A (B/610)	SC	1	4,490,238	5839	N -	120,000	-	Utilities - Steam
610-BLR005	Boiler 5 (B/610)	SC	1	18,906,162	5839	N -	-	-	Utilities - Steam
610-BLR006	Boiler 6 (B/610)	SC	1	7,805,258	5839	N -	-	-	Utilities - Steam
610-BLR007	Boiler No. 7 (B/610)	SC	1	3,718,199	5819	N -	-	-	Utilities - Steam
CONDENSATE	Condensate Return System	SC	1	16,524,723	8839	N -	-	-	Utilities - Steam
HEAT_SYS_OTHER	Heating System Other	SC	1	12,685,847	8839	N -	-	-	Utilities - Steam
ST0611C	Fuel Oil Tank #3 300K Gal.	SC	1	940,558	4221	N -	-	-	Utilities - Steam
ST0611D	Fuel Oil Tank #4 420K Gal.	SC	1	949,384	4221	N -	-	-	Utilities - Steam
ST0611E	Fuel Oil Tank #5 300K Gal.	SC	1	1,116,597	4221	N -	-	-	Utilities - Steam
ST0611F	Fuel Oil Tank #6 300K Gal.	SC	1	542,276	4221	N -	-	-	Utilities - Steam
ST0611G	Fuel Oil Tank #9 400K Gal.	SC	1	1,128,253	4221	N -	-	-	Utilities - Steam
ST0611H	Fuel Oil Tank #10 600K Gal.	SC	1	67,637	4221	N -	-	-	Utilities - Steam
STEAM_PLANT	Central Steam Plant (B/610)	SC	1	176,215	4322	N -	-	-	Utilities - Steam
STEAM_SYS	Steam Supply System	SC	1	62,744,967	8839	N -	350,000	17,913,000	Utilities - Steam
SEWER_GRAV	Sewerage Sys Gravity	SC	1	22,807,453	8529	N -	-	10,000,000	Utilities - Sanitary/Storm
SEWER_PLANT	Sewerage Treatment Plant	SC	1	13,472,407	5529	N -	-	-	Utilities - Sanitary/Storm
SEWER_PUMP	Sewerage System Pumped	SC	1	1,438,663	8549	N -	-	700,000	Utilities - Sanitary/Storm
STORM_GRAV	Storm Water System-Gravity	SC	1	2,304,797	8629	N -	-	600,000	Utilities - Sanitary/Storm
STORM_PUMP	Storm Water System Pumped	SC	1	48,603	8649	N -	-	-	Utilities - Sanitary/Storm
ST0049	Water Storage Tank	SC	1	637,138	4121	N -	651,326	-	Utilities - Potable Water
ST0640	Water Storage Tank	SC	1	2,217,712	4121	N -	50,233	-	Utilities - Potable Water
WATER_OTHER	Sewerage And Storm Other	SC	1	1,355,715	5529	N -	-	-	Utilities - Potable Water
WATER_POTABLE	Potable Distribution	SC	1	10,680,696	8129	N -	1,525,000	10,483,000	Utilities - Potable Water
WELL_1	Water Supply Wells No 1	SC	1	696,643	5169	N -	-	-	Utilities - Potable Water
WELL_10	Water Supply Well No 10	SC	1	1,440,220	5169	N -	-	-	Utilities - Potable Water
WELL_11	Water Supply Well No 11	SC	1	1,237,485	5169	N -	-	-	Utilities - Potable Water
WELL_12	Water Supply Well No 12	SC	1	1,789,413	5169	N -	-	-	Utilities - Potable Water
WELL_2	Water Supply Well No 2	SC	1	694,432	5169	N -	-	-	Utilities - Potable Water
WELL_4	Water Supply Well No 4	SC	1	2,041,943	5169	N -	-	-	Utilities - Potable Water
WELL_6	Water Supply Well No 6	SC	1	1,378,167	5169	N -	-	-	Utilities - Potable Water
WELL_7	Water Supply Well No 7	SC	1	1,378,264	5169	N -	-	-	Utilities - Potable Water
WELLS_NON POTABLE	WELLS_NON POTABLE	SC	2	1,457,870	5159	N -	-	-	Utilities - Potable Water
13.8 OVERHEAD LINE	13.8kV Overhead Line	SC	1	3,981,284	8929	N -	-	-	Utilities - Electric
13.8KV CABLE	13.8 Undergrd Cables	SC	1	25,707,717	8939	N -	-	11,070,000	Utilities - Electric
2.4KV OH CABLE	2.4 Overhead Lines	SC	1	3,442,821	8939	N -	2,331,581	-	Utilities - Electric

INVENTORY OF OSF

ID	NAME	PSO	ESN	RPV	USE	EXCESS	DM	RIC	TYPE
2.4KV UG CABLE	2.4 Undergrd Cables	SC	1	19,011,509	8939	N -	-	-	Utilities - Electric
GENERATOR_629	Med/Bio Emergency Power	SC	1	805,281	5906	N -	-	-	Utilities - Electric
ST0613	Substation	SC	1	210,044	8988	N -	-	-	Utilities - Electric
ST0616	Substation	SC	1	979,508	8979	N -	-	-	Utilities - Electric
ST0617	Substation	SC	1	1,210,607	8979	N -	-	-	Utilities - Electric
ST0643	AGS Substation	SC	1	409,703	8979	N -	-	-	Utilities - Electric
ST0661	Substation at Rochester Street	SC	1	1,360,577	8979	N -	-	-	Utilities - Electric
SUBSTA_3J	3J Substation	SC	1	329,984	8979	N -	-	-	Utilities - Electric
SUBSTA_479	Machine Shop B	SC	1	603,318	8979	N -	-	-	Utilities - Electric
SUBSTA_5N	5N Substation	SC	1	329,984	8979	N -	-	-	Utilities - Electric
SUBSTA_603_13.8	Temple Place Substation	SC	1	6,497,163	8979	N -	-	-	Utilities - Electric
SUBSTA_603_2.4	603 2.4kV Substation	SC	1	277,947	8979	N -	-	-	Utilities - Electric
SUBSTA_631_13.8	Fifth Ave Substation	SC	1	7,072,919	8979	N -	-	-	Utilities - Electric
SUBSTA_701	701 Substation	SC	1	188,805	8979	N -	-	-	Utilities - Electric
SUBSTA_704	704 Transformer	SC	1	78,276	8988	N -	-	-	Utilities - Electric
SUBSTA_7N	7N Substation	SC	1	427,916	8979	N -	-	-	Utilities - Electric
SUBSTA_801	801 Transformer	SC	1	31,385	8988	N -	-	-	Utilities - Electric
SUBSTA_820	820 Transformer	SC	1	217,147	8988	N -	-	-	Utilities - Electric
SUBSTA_901	901 Transformer	SC	1	415,690	8988	N -	-	-	Utilities - Electric
SUBSTA_902E	902 East Substation	SC	1	940,443	8979	N -	-	-	Utilities - Electric
SUBSTA_902W	902 West Substation A-West	SC	1	287,047	8979	N -	-	-	Utilities - Electric
SUBSTA_A	A Substation	SC	1	792,613	8979	N -	-	-	Utilities - Electric
SUBSTA_B	B Substation	SC	1	841,030	8979	N -	-	-	Utilities - Electric
SUBSTA_BC	BC Substation	SC	1	581,455	8979	N -	-	-	Utilities - Electric
SUBSTA_C	C Substation	SC	1	841,030	8979	N -	-	-	Utilities - Electric
SUBSTA_E	E Substation	SC	1	329,984	8979	N -	-	-	Utilities - Electric
SUBSTA_F	F Substation	SC	1	1,505,188	8979	N -	-	-	Utilities - Electric
SUBSTA_G	G Substation	SC	1	549,318	8979	N -	-	-	Utilities - Electric
SUBSTA_H	H Substation	SC	1	329,984	8979	N -	-	-	Utilities - Electric
SUBSTA_K	K Substation	SC	1	1,019,042	8979	N -	-	-	Utilities - Electric
SUBSTA_L	L Substation	SC	1	1,152,471	8979	N -	-	-	Utilities - Electric
SUBSTA_M	M Substation	SC	1	2,857,626	8979	N -	-	-	Utilities - Electric
SUBSTA_N4	N4 Substation	SC	1	303,515	8979	N -	-	-	Utilities - Electric
SUBSTA_P	P Substation	SC	1	233,178	8979	N -	-	-	Utilities - Electric
SUBSTA_RF	RF Substation	SC	1	537,580	8979	N -	-	-	Utilities - Electric
SUBSTA_RF_MG	RF_MG Substation	SC	1	301,520	8979	N -	-	-	Utilities - Electric

INVENTORY OF OSF

ID	NAME	PSO	ESN	RPV	USE	EXCESS	DM	RIC	TYPE
SUBSTA_SB	SB Substation	SC	1	674,989	8979	N -	-	-	Utilities - Electric
DUCTBANK_COMM	Com. Ductbank, Tech.St.	SC	1	1,134,677	7231	N -	-	-	Utilities - Communications
FIBER_OPTIC	Fiber-Optic Infrastructure	SC	1	1,859,290	7231	N -	-	-	Utilities - Communications
FIRE_ALARM_SITE	Fire Alarm System	SC	1	119,710	7331	N -	1,200,000	785,000	Utilities - Communications
ST0658	Chilled Water Storage Tank	SC	1	4,192,288	4171	N -	8,930	-	Utilities - Chilled Water
WATER_CHILL/AIR	Underground Cw & Air Dist Sys	SC	1	8,099,183	8721	N -	-	-	Utilities - Chilled Water
ST0574	Weapons Range Facility	SC	2	633,938	2469	N -	-	-	Safeguards & Security
ST0690	Tactical Training Station	SC	2	27,000	2919	N -	-	-	Safeguards & Security
ST0568	Vehicle Monitoring Station	SC	2	16,648	5009	N -	-	-	Radiological Controls
1070-BMRR	Medical Reactor	SC	3	10,172,816	3009	N -	-	-	Programmatic - Reactors
1105	Accelerator Test Facility	SC	1	1,740,070	3251	N -	-	-	Programmatic - Physics
1030-VDG	Van degraff Gen	SC	1	7,606,483	3209	N -	-	-	Programmatic - Physics
1100-NSLS	NSLS	SC	1	118,102,095	3221	N -	2,104,937	-	Programmatic - NSLS
2030	Metal Incinerator	SC	3	24,644	6419	N -	-	-	Programmatic - Medical
2040	Hardened Antenna	SC	2	266,792	7281	N -	-	-	Instrumentation
6250703	Lab/Office Bldg 703 Tanks	SC	2	63,708	4322	N -	-	-	Programmatic - EENS
6250801	Hot Laboratory (B/801)	SC	1	30,607	4322	N -	-	-	Programmatic - EENS
6250815	Energy Science & Technology	SC	1	31,537	4322	N -	-	-	Programmatic - EENS
1080-ACCEL	Radiological Accel	SC	1	7,842,886	3221	N -	-	-	Programmatic - EENS
ST0713	Meteorology Tower 280'-EE-GD73	SC	2	6,331,704	7279	N -	-	100,000	Programmatic - EENS
1106	Source Development Lab in Bldg. 930	SC	1	3,781,057	3251	N -	-	-	Accelerator
2060	913	SC	1	920,324	3221	N -	-	-	Accelerator
2070	913	SC	1	473,086	3221	N -	-	-	Accelerator
2080	913	SC	1	980,707	3221	N -	-	-	Accelerator
2090	913	SC	1	808,831	3221	N -	-	-	Accelerator
2100	913	SC	1	321,949	3221	N -	-	-	Accelerator
2250	913	SC	1	55,926	3221	N -	-	-	Accelerator
2290	Rf Mg Cooling Tower	SC	2	190,097	5769	N -	-	-	Accelerator
2300	EEBA Cooling Tower	SC	2	179,099	5769	N -	-	-	Accelerator
2310	Mev Linac Tower	SC	2	171,856	3221	N -	-	-	Accelerator
2330	Shielding Block Yard	SC	2	83,797	2009	N -	-	-	Accelerator
2370	Liquid Helium Storage (Bldg 1005)	SC	1	644,477	4319	N -	-	-	Accelerator
2390	Helium Storage Tanks (B/1006B)	SC	1	679,077	4331	N -	-	-	Accelerator
403030162	Gas Storage-RHIC-(B/1005G)	SC	1	473,975	4331	N -	-	-	Accelerator
409030165	Emergency Holding Pit 1-2260	SC	2	41,920	4431	N -	-	-	Accelerator
409030167	Emergency Holding Pit 3-2280	SC	2	41,920	4431	N -	-	-	Accelerator

INVENTORY OF OSF

ID	NAME	PSO	ESN	RPV	USE	EXCESS	DM	RIC	TYPE
409030169	Emergency Holding Pit 2-2270	SC	2	41,920	4431	N -	-	-	Accelerator
409030170	Storage Tank 2-Liq Nitro-2130	SC	2	1,024,876	4331	N -	-	-	Accelerator
409030172	Cryogenic Liq Storage Fac (B/963)	SC	1	116,183	4331	N -	-	-	Accelerator
701030173	Heavy Ion Beam Line-1101	SC	1	10,693,005	3209	N -	-	-	Accelerator
1010-TVG	Tandem Van degraaff	SC	1	56,430,529	3209	N -	-	-	Accelerator
1020-AGS	AGS in Bldg 913	SC	1	360,824,447	3221	N -	900,000	-	Accelerator
1102-AGSMAGNET	AGS Magnet System	SC	1	16,681,879	3221	N -	-	-	Accelerator
1103-AGSLINAC	200 M Linac Machine	SC	1	6,966,437	3251	N -	507,000	-	Accelerator
1104-AGSBOOSTER	AGS Booster Accelerator	SC	1	72,829,828	3221	N -	-	-	Accelerator
1107-RHIC	RHIC Machine	SC	1	577,789,377	3221	N -	3,000,000	1,075,000	Accelerator
ST1004	Facility Hall at 4 O'clock in Bldg. 1000	SC	1	2,069,506	3221	N -	-	-	Accelerator
1040-CYCL	60 In Cyclotron	SC	1	19,993,732	3209	N -	-	-	Programmatic - Chemistry
1050-VDG	Van degraaff Gen 465	SC	1	1,239,335	3209	N -	-	-	Programmatic - Chemistry
409030164	Storage Platform-2210	SC	3	182,849	4010	N -	-	-	Management
ST0626	Storage Platform	SC	3	11,000	6008	N -	-	-	Management
0001	Improvements To Land (wells-non	SC	2	17,138,059	2009	N -	-	-	Land, Roads & Walks
FENCES	Fences	SC	2	2,140,764	2429	N -	11,476	-	Land, Roads & Walks
LANDSCAPE_SITE PREP	Site Preparation	SC	2	2,567,091	2009	N -	-	-	Land, Roads & Walks
PARKING_LOTS	Parking Lots And Hardstds	SC	2	3,575,490	1789	N -	3,378,447	-	Land, Roads & Walks
RAILROAD	Railroad Tracks	SC	2	1,534,112	1429	N -	215,230	-	Land, Roads & Walks
ROADS	Roads And Bridges	SC	1	10,519,061	1729	N -	3,071,469	1,744,000	Land, Roads & Walks
SIDEWALKS	Paved Walks	SC	2	2,320,056	1129	N -	400,412	-	Land, Roads & Walks
2010	Test Wells	SC	2	1,461,257	5159	N -	-	-	Environmental Services
2020	Monitoring Station	SC	2	48,611	2009	N -	-	-	Environmental Services
2240	Gauging Station	SC	2	12,455	2009	N -	-	-	Environmental Services
2340	Monitoring Wells	SC	2	3,966,859	5171	N -	-	60,000	Environmental Services
GW_TREATMENT	Treatment Plants	EM	1	31,081,893	5129	N -	-	-	EM
2360	OER Monitoring Wells	EM	2	1,688,358	5171	N -	-	-	EM
2395	I.P.)	EM	1	1,974,557	1309	N -	-	-	EM
2410	S. Boundary Pump & Treat Sys.(OU III)	EM	1	699,812	8159	N -	-	-	EM
2415	Pump/treatment	EM	1	2,897,560	8159	N -	-	-	EM
2420	System	EM	1	1,989,229	8159	N -	-	-	EM
2425	VOC Treatment System (B/96)	EM	1	1,648,016	8159	N -	-	-	EM
2430	(B/670)	EM	1	2,582,595	8159	N -	-	-	EM
6250750	High Flux Beam Reactor Tank	EM	3	250,072	4322	N -	-	-	EM
1090-HFBR	HFBR	EM	3	93,392,497	3009	N -	-	-	EM

INVENTORY OF OSF

ID	NAME	PSO	ESN	RPV	USE	EXCESS	DM	RIC	TYPE
2405-STACKDRAIN	Liquid Waste Piping System (ST0705)	EM	3	1,032,295	4441	N -	-	-	EM
OS-1	Industrial Park Treatment System	EM	1	1,976,476	8159	N -	-	-	EM
OS-3	LIPA Vault	EM	1	422,905	8159	N -	-	-	EM
OS-4	Airport Treatment System	EM	1	5,221,316	8159	N -	-	-	EM
OS-5	North Street Treatment System	EM	1	2,525,312	8159	N -	-	-	EM
OS-5E	North Street East Treatment System	EM	1	687,821	8159	N -	-	-	EM
OS-6	System	EM	1	1,943,128	8159	N -	-	-	EM
ST0707	HFBR Cooling Tower Basin	EM	3	1,144,459	8159	N -	-	-	EM

N

DEER LEEP ROAD

HALF MOON POND ROAD

HALF MOON POND

PINE BARREN PATH

VIEW PATH

PLEASANT VIEW PATH

CRESCENT PATH

NORTH FIRE BREAK

EAST SADDLE PATH

EAST MARGIN PATH

Z PATH

RING ROAD

PUBLIC OUTER RING ROAD

PUBLIC INNER RING ROAD

COLLIDER-ACCELERATOR DEPT (C-A.D.)

FOREST PATH

RANGE ROAD

SEWAGE TREATMENT PLANT

S. TREATMENT PLANT PATH

EAST FIRE BREAK

WHITE PINE PATH

THORN HILL WAY

SHOTGUN WAY

COMPOST CENTER

CRESCENT PATH

FIRST ST.

WEST FIFTH FIRE BREAK

WASTE MANAGEMENT FACILITY

EAST FIFTH AVE.

PRINCE PATH

CANOPY ROAD

CORNELL PATH

NATIONAL WEATHER SERVICE

ASTRONAUT WAY

WEST BROOKHAVEN FIREBREAK

BROOKHAVEN AVE

FORMER SWMF AREA

BLUE'S POND

POWER LINE ROAD

LONG ISLAND EXPRESSWAY

LABORATORY ENTRANCE

EAST PRINCETON PATH

FAWN PATH

MIDDLE PATH

SKUNK HOLLOW PATH

APARTMENT AREA

SOUTH APARTMENT FIRE BREAK

S. BOUNDARY PATH

0 300 600 900 1200 FT.

JOB NO.	SHEET NO	REVISION	DATE	DWN.	APP'D.	QA

BROOKHAVEN NATIONAL LABORATORY

UNDER CONTRACT WITH
UNITED STATES DEPARTMENT OF ENERGY
PLANT ENGINEERING DIVISION
UPTON, NEW YORK 11973

JOB TITLE: UTILITY SYSTEM MAP		DWG. TITLE: BUILDINGS & ROADS MAP	
SUBMITTAL ITEM	DATE: 5-30-07	ACCT. NO.	SHEET OF: 1 1
SCALE: AS NOTED	DWN. BY: WGB	JOB NO.	DWG. NO.
PROJ. QA	APP'D. BY	BLDG. NO.: SITE	
PATH:			

N

COLLIDER-ACCELERATOR DEPT
(C-A.D.)

SEWAGE TREATMENT PLANT

WASTE MANAGEMENT FACILITY

NATIONAL WEATHER SERVICE

FORMER AWMF AREA

LABORATORY ENTRANCE

APARTMENT AREA

RHIC OUTER RING ROAD

RING ROAD

PINE BARK PATH

FOREST PATH

RANGE ROAD

CRESCENT PATH

EAST MARGIN PATH

S. TREATMENT PLANT PATH

BAST FIRE BREAK

Z PATH

COMPOST CENTER

SHOTGUN WAY

FIRST ST.

EAST FIFTH AVE.

PRINCE PATH

ASTRONOMY WAY

WHITE PINE PATH

THORN HILL WAY

WEST FIFTH FIRE BREAK

CANOPY ROAD

CORNELL PATH

WEST BROOKHAVEN FIREBREAK

BROOKHAVEN AVE

POWER LINE ROAD

LONG ISLAND RAILROAD

BLUE'S POND

EAST PRINCETON PATH

FAWN PATH

MIDDLE PATH

SKUNK HOLLOW PATH

SOUTH APARTMENT FIRE BREAK

0 300 600 900 1200 FT.

LEGEND

- 13.8kV IN UNDERGROUND DUCT
- 13.8kV AERIAL LINE
- ABANDONED 13.8kV LINES
- ELECTRICAL MANHOLE AND MH-NUMBER (MH-51)
- 69KV AERIAL LINE
- ABANDONED 69kV LINES
- KEYSPAN 138kV AERIAL LINE

JOB NO.	SHEET NO.	REVISION	DATE	DWN.	APP'D.	QA
		A				

BROOKHAVEN NATIONAL LABORATORY

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UNITED STATES DEPARTMENT OF ENERGY
PLANT ENGINEERING DIVISION
UPTON, NEW YORK 11973

JOB TITLE: UTILITY SYSTEM MAP	DWG. TITLE: 13.8 kV /69kV ELECTRICAL DISTRIBUTION SYSTEM
R.R./OFF./LNS. NEW	DATE: 12-20-06
SCALE: AS NOTED	DWN. BY: WGB
PROJ. QA	APP'D. BY
ACCT. NO.	SHEET OF 1 1
JOB NO.	DWG. NO.
BLDG. NO.: SITE	
PATH:	

N

HALF MOON POND

COLLIDER-ACCELERATOR DEPT (C-A.D.)

SEWAGE TREATMENT PLANT

WASTE MANAGEMENT FACILITY

NATIONAL WEATHER SERVICE

FORMER CWMF AREA

LABORATORY ENTRANCE

APARTMENT AREA

BLUE'S POND

RHIC OUTER RING ROAD

RING ROAD

WHITE PINE PATH

THORN HILL WAY

WEST FIFTH FIRE BREAK

SOUTH APARTMENT FIRE BREAK

CANOPY ROAD

CORNELL PATH

WEST BROOKHAVEN FIREBREAK

PINE BARK PATH

CRESCENT PATH

FOREST PATH

EAST MARGIN PATH

Z PATH

RANCE ROAD

S. TREATMENT PLANT PATH

EAST FIRE BREAK

SHOTGUN WAY

COMPOST CENTER

FIRST ST.

EAST FIFTH AVE.

PRINCE PATH

ASTRONOMY WAY

BROOKHAVEN AVE

POWER LINE ROAD

LONG ISLAND RAILROAD

EAST PRINCETON PATH

PAWN PATH

MIDDLE PATH

SKUNK HOLLOW PATH

S. BOUNDARY PATH

LONG ISLAND EXPRESSWAY

LEGEND

- CABLE IN UNDERGROUND DUCT
- DIRECT BURIAL CABLE
- CONTROL LINE
- AERIAL LINE
- AERIAL LINE POLE AND POLE NUMBER (5T)
- FUSE CUTOUT
- ELECTRICAL MANHOLE AND MH-NUMBER (MH-26)
- ELECTRICAL HANDHOLE AND HH-NUMBER (HH-38)
- ABANDONED 2.4kV LINES

0 300 600 900 1200 FT.

JOB NO.	SHEET NO.	REVISION	DATE	DWN.	APP'D.	QA

BROOKHAVEN NATIONAL LABORATORY

UNDER CONTRACT WITH
UNITED STATES DEPARTMENT OF ENERGY
PLANT ENGINEERING DIVISION
UPTON, NEW YORK 11973

JOB TITLE: UTILITY SYSTEM MAP	DWG. TITLE: 2.4KV ELECTRICAL DISTRIBUTION SYSTEM
R.R./SPP.J.NO., NEW:	DATE: 12/04/06
SCALE: AS NOTED	DWN. BY: WGB
PROJ. QA:	APP'D. BY:
PATH:	ACCT. NO.:
JOB NO.:	SHEET OF: 1 1
BLDG. NO.: SHEET	DWG. NO.:

N

COLLIDER-ACCELERATOR DEPT (C-A.D.)

SEWAGE TREATMENT PLANT

WASTE MANAGEMENT FACILITY

NATIONAL WEATHER SERVICE

FORMER SWMF AREA

LABORATORY ENTRANCE

APARTMENT AREA

RHIC OUTER RING ROAD

RING ROAD

PINE BARK PATH

CRESCENT PATH

EAST MARGIN PATH

Z PATH

FOREST PATH

RANCE ROAD

S. TREATMENT PLANT PATH

EAST FIRE BREAK

COMPOST CENTER

SHOTGUN WAY

FIRST ST.

WHITE PINE PATH

THORN HILL WAY

WEST FIFTH FIRE BREAK

EAST FIFTH AVE.

PRINCE PATH

ASTRONOMY WAY

CANOPY ROAD

CORNELL PATH

WEST BROOKHAVEN FIREBREAK

BLUE'S POND

BROOKHAVEN AVE

POWER LINE ROAD

LONG ISLAND RAILROAD

EAST PRINCETON PATH

FAWN PATH

MIDDLE PATH

SKUNK HOLLOW PATH

SOUTH APARTMENT FIRE BREAK

S. BOUNDARY PATH

LONG ISLAND EXPRESSWAY

0 300 600 900 1200 FT.

LEGEND

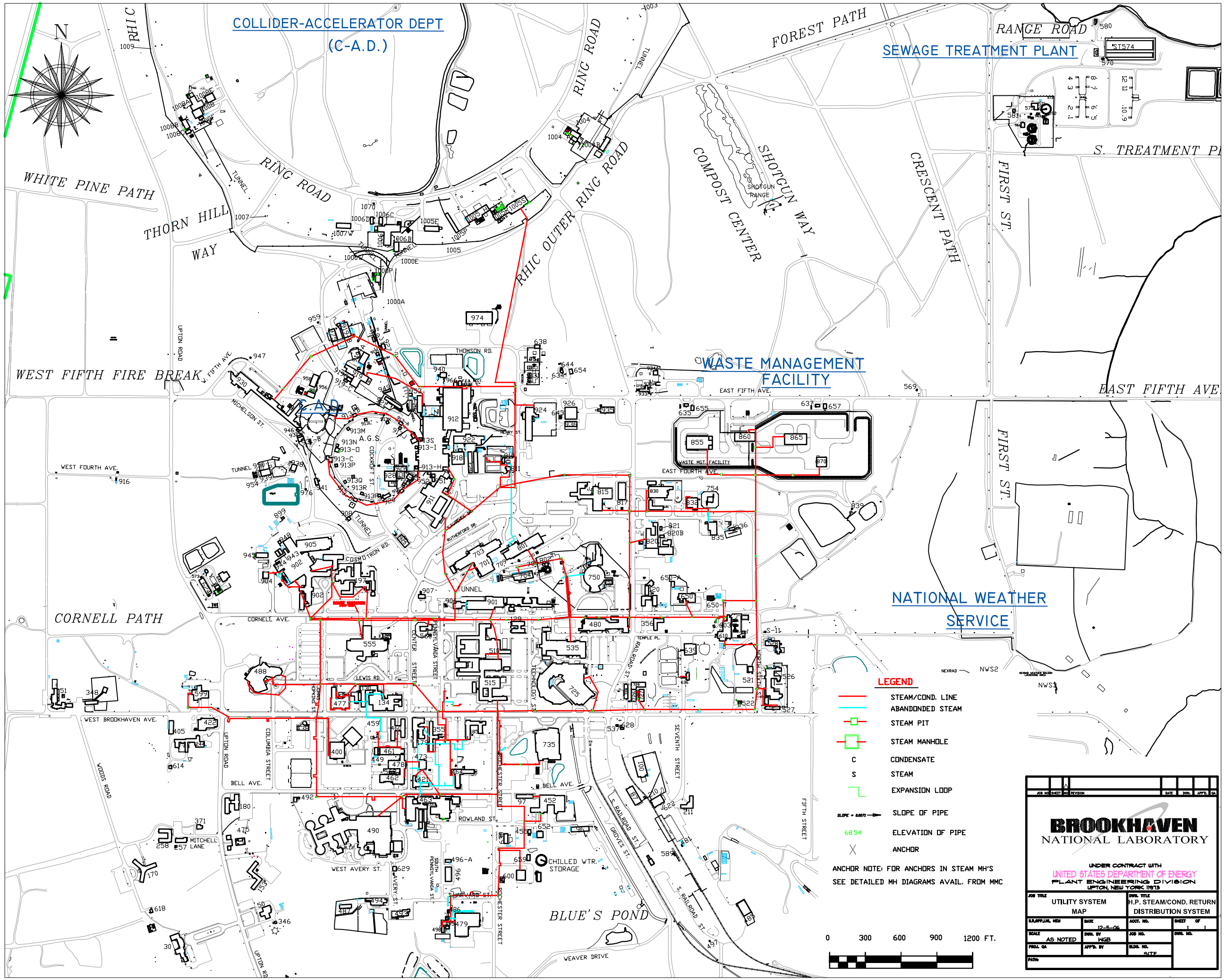
- UNDERGROUND DUCT BANK
- SIGNAL CABLE
- CABLE RUN IN TRAY
- AERIAL LINE
- AERIAL LINE POLE
- ABANDONED LINE
- ABANDONED BELL SYSTEM PLATS (DIR. BUR.) (CABLE WAS INPUT FROM CONCEPTUAL DRAWINGS)
- C — DIRECT BURIAL CABLE
  - C - COMPUTER
  - F - FIRE ALARM
  - P - PUMP CONTROL
  - T - TELEPHONE

JOB NO.	SHEET NO.	REVISION	DATE	DWN.	APP'D.	QA

BROOKHAVEN NATIONAL LABORATORY

UNDER CONTRACT WITH
UNITED STATES DEPARTMENT OF ENERGY
PLANT ENGINEERING DIVISION
UPTON, NEW YORK 11973

JOB TITLE: UTILITY SYSTEM MAP		DWG. TITLE: TELECOMMUNICATIONS DISTRIBUTION SYSTEM	
R.R./SPP./I.N.S. NEW	DATE: 12-20-06	ACCT. NO.	SHEET OF 1 1
SCALE: AS NOTED	DWN. BY: WGB	JOB NO.	DWG. NO.
PROJ. QA	APP'D. BY	BLDG. NO.: SITE	
PATH:			


COLLIDER-ACCELERATOR DEPT
(C-A.D.)
SEWAGE TREATMENT PLANT
WASTE MANAGEMENT FACILITY
NATIONAL WEATHER SERVICE
C-A.D.
RHIC OUTER RING ROAD
RING ROAD
TUNNEL
FOREST PATH
RANGE ROAD
WHITE PINE PATH
THORN HILL WAY
COMPOST CENTER
SHOTGUN WAY
SHOTGUN RANGE
CRESCENT PATH
FIRST ST.
S. TREATMENT PL
EAST FIFTH AVE
WEST FIFTH FIRE BREAK
UPTON ROAD
THOMSON RD.
MICHELSON ST.
A.G.S.
COCKCROFT ST.
TUNNEL
RUTHERFORD DR.
COSWD TRON RD.
CORNELL PATH
CORNELL AVE.
LEWIS RD.
PENNSYLVANIA STREET
CENTER STREET
TECHNOLOGY ST.
RAILROAD ST.
TEMPLE PL.
WEST BROOKHAVEN AVE.
COLUMBIA STREET
WOODS ROAD
BELL AVE.
ROWLAND ST.
ROCHESTER STREET
SOUTH PENNSYLVANIA ST.
HARVARD ST.
WEST AVERY ST.
AVERY ST.
MITCHELL LANE
CHILLED WTR. STORAGE
BLUE'S POND
WEAVER DRIVE
WEST FOURTH AVE.
EAST FOURTH AVE.
WASTE MGT. FACILITY
SEVENTH STREET
FIFTH STREET
S. RAILROAD ST.
GROVES ST.
HENRY ST.
NEXRAD
NWS2
NWS1
N
LEGEND
STEAM/COND. LINE
ABANDONDED STEAM
STEAM PIT
STEAM MANHOLE
C CONDENSATE
S STEAM
EXPANSION LOOP
SLOPE = 0.0071 SLOPE OF PIPE
68.54 ELEVATION OF PIPE
ANCHOR
ANCHOR NOTE: FOR ANCHORS IN STEAM MH'S
SEE DETAILED MH DIAGRAMS AVAIL. FROM MMC
0 300 600 900 1200 FT.
BROOKHAVEN
NATIONAL LABORATORY
UNDER CONTRACT WITH
UNITED STATES DEPARTMENT OF ENERGY
PLANT ENGINEERING DIVISION
UPTON, NEW YORK 11973
JOB TITLE
UTILITY SYSTEM MAP
DWG. TITLE
H.P. STEAM/COND. RETURN DISTRIBUTION SYSTEM
R.R./SPPLNS, MEM
DATE 12-5-06
ACCT. NO.
SHEET OF 1 1
SCALE AS NOTED
DWN. BY WGB
JOB NO.
DWG. NO.
PROJ. CA
APP'D. BY
BLDG. NO. 01TF
PATH:

N

NATIONAL WEATHER SERVICE

FORMER ARE

CHILLED WTR. STORAGE

BLUE'S POND

WASTE MGT. FACILITY

EAST FOURTH AVE.

CORNELL AVE.

TUNNEL

COSMOTRON RD.

RUTHERFORD DR.

CENTER STREET

PENNSYLVANIA STREET

TECHNOLOGY ST.

RAILROAD ST.

TEMPLE PL.

NORTH SIXTH ST.

BROOKHAVEN AVE.

NEXRAD GENERATOR BLDG.

WEATHER FORCASTING

LEWIS RD.

JOHNS HOPKINS ST.

COLUMBIA STREET

UPTON ROAD

BELL AVE.

ROWLAND ST.

ROCHESTER STREET

SEVENTH STREET

FIFTH STREET

S. RAILROAD ST.

GROVES ST.

WEST AVERY ST.

AVERY ST.

SOUTH PENNSYLVANIA ST.

S. HARVARD ST.

MITCHELL LANE

UPTON RD.

EAST PRINCETON AVE.

WEAVER DRIVE

YALE ROAD

FIRST ST.

POWER LINE ROAD

EAST PRINCETON PATH

FAWN PATH

MIDDLE PATH

BROOKHAVEN

LEGEND

- CHILLED WATER SERVICE\RETURN LINE
- COMPRESSED AIR LINE
- AIR RELIEF LINE
- VALVE
- AIR RELIEF VENT
- PUMP OUT CONNECTION
- THRUST BLOCK

0 300 600 900 1200 FT.

JOB NO.	SHEET NO	REVISION	DATE	DWN.	APP'D.	QA

BROOKHAVEN NATIONAL LABORATORY
PLANT ENGINEERING I. M. DIVISION
UPTON, NEW YORK 11973

BROOKHAVEN SCIENCE ASSOCIATES
UNDER CONTRACT WITH
UNITED STATES DEPARTMENT OF ENERGY

JOB TITLE	DWG. TITLE
UTILITY SYSTEM	CHILLED WATER SYSTEM

ILR, GPP, LNI, IHEM	DATE	ACCT. NO.	SHEET OF
	12-6-06		1 1
SCALE	DWN. BY	JOB NO.	DWG. NO.
AS NOTED	WGB		
PROJ. QA	APP'D. BY	BLDG. NO.	
A		SITE	

N

COLLIDER-ACCELERATOR DEPT
(C-A.D.)

SEWAGE TREATMENT PLANT

WASTE MANAGEMENT FACILITY

NATIONAL WEATHER SERVICE

FORMER LWMF AREA

LABORATORY ENTRANCE

APARTMENT AREA

RHIC OUTER RING ROAD

RING ROAD

PINE BARK PATH

FOREST PATH

RANGE ROAD

CRESCENT PATH

COMPOST CENTER

SHOTGUN WAY

FIRST ST.

EAST MARGIN PATH

S. TREATMENT PLANT PATH

EAST FIRE BREAK

Z PATH

PRINCE PATH

ASTRONOMY WAY

EAST BOUNDARY AVENUE

NORTH ST.

LONG ISLAND RAILROAD

WHITE PINE PATH

THORN HILL WAY

WEST FIFTH FIRE BREAK

EAST FIFTH AVE.

CANOPY ROAD

CORNELL PATH

WEST BROOKHAVEN FIREBREAK

BROOKHAVEN AVE

BLUE'S POND

POWER LINE ROAD

EAST PRINCETON PATH

FAWN PATH

MIDDLE PATH

WILLIAM FLOYD PARKWAY

LEGEND

- V- MAIN DISTRIBUTION VALVE
- P- POST INDICATOR VALVE (FOR FIRE PROTECTION LINES ONLY)
- SV- SERVICE VALVE (FOR COMBINED FIRE PROTECTION & DOMESTIC WATER LINES)
- DS DOMESTIC SERVICE VALVE
- FIRE HYDRANT WITH SHUT-OFF VALVE
- DOMESTIC WATER LINE
- ABANDONED DOMESTIC WATER LINE
- SIAMESE CONNECTION
- REDUCER
- THRUST BLOCK
- RPZ- BACK FLOW VALVE

0 300 600 900 1200 FT.

JOB NO.	SHEET NO.	REVISION	DATE	DWN.	APP'D.	QA

BROOKHAVEN NATIONAL LABORATORY

UNDER CONTRACT WITH
UNITED STATES DEPARTMENT OF ENERGY
PLANT ENGINEERING DIVISION
UPTON, NEW YORK 11973

JOB TITLE: UTILITY SYSTEM MAP		DWG. TITLE: POTABLE WATER FIRE PROTEC. SYSTEMS	
R.R./GPP.,LINE, MEM	DATE: 11-9-06	ACCT. NO.	SHEET OF 1 1
SCALE: AS NOTED	DWN. BY: WGB	JOB NO.	DWG. NO.
PROJ. QA	APP'D. BY	BLDG. NO.: SITE	
PATH:			

N

HALF MOON POND

COLLIDER-ACCELERATOR DEPT
(C-A.D.)

SEWAGE TREATMENT PLANT

WASTE MANAGEMENT
FACILITY

NATIONAL WEATHER
SERVICE

FORMER AWMF
AREA

LABORATORY
ENTRANCE

APARTMENT
AREA

RHIC OUTER RING ROAD

RING ROAD

CRESCENT PATH

EAST MARGIN PATH

Z PATH

FOREST PATH

RANCE ROAD

S. TREATMENT PLANT PATH

EAST FIRE BREAK

FIRST ST.

COMPOST CENTER

SHOTGUN WAY

WHITE PINE PATH

THORN HILL WAY

WEST FIFTH FIRE BREAK

EAST FIFTH AVE.

PRINCE PATH

ASTRONOMY WAY

CANOPY ROAD

CORNELL PATH

WEST BROOKHAVEN
FIREBREAK

BROOKHAVEN AVE

BLUE'S POND

POWER LINE ROAD

LONG ISLAND RAILROAD

EAST PRINCETON PATH

FAWN PATH

MIDDLE PATH

SKUNK HOLLOW PATH

SOUTH APARTMENT FIRE BREAK

0 300 600 900 1200 FT.

LEGEND

- SANITARY LINE
- SANITARY FORCED MAIN
- DIRECTION OF FLOW
- MH- ABANDONED SANITARY MANHOLE
- CP CESSPOOLS
- S.T. SEPTIC TANK
- C.O. CLEAN OUT
- G.T. GREASE TRAP
- OR SE- SEWAGE PUMPING STATION
- PIV PIV VALVE
- LEACH FIELD
- LEACHING POOL
- AERATION LINE (SEWAGE TREATMENT PLANT ONLY)
- SLUDGE LINE (SEWAGE TREATMENT PLANT ONLY)

JOB NO	SHEET NO	REVISION	DATE	DWN.	APP'D. QA

BROOKHAVEN
NATIONAL LABORATORY

UNDER CONTRACT WITH
UNITED STATES DEPARTMENT OF ENERGY
PLANT ENGINEERING DIVISION
UPTON, NEW YORK 11973

JOB TITLE: UTILITY SYSTEM MAP		DWG. TITLE: SANITARY SYSTEM MAP	
R.R./APP.LINE, MEM	DATE: 9-11-06	ACCT. NO.	SHEET 1 OF 1
SCALE: AS NOTED	DWN. BY: WGB	JOB NO.	DWG. NO.
PROJ. QA	APP'D. BY	BLDG. NO.: SITE	
PATH: S:/UTILITY/SITE-ELE/13-8KV			

N

COLLIDER-ACCELERATOR DEPT
(C-A.D.)

SEWAGE TREATMENT PLANT

WASTE MANAGEMENT FACILITY

NATIONAL WEATHER SERVICE

FORMER LWMF AREA

LABORATORY ENTRANCE

APARTMENT AREA

RHIC OUTER RING ROAD

RING ROAD

FOREST PATH

RANGE ROAD

EAST MARGIN PATH

S. TREATMENT PLANT PATH

EAST FIRE BREAK

Z PATH

WHITE PINE PATH

THORN HILL WAY

COMPOST CENTER

SHOTGUN WAY

CRESCENT PATH

FIRST ST.

WEST FIFTH FIRE BREAK

EAST FIFTH AVE.

PRINCE PATH

ASTRONOMY WAY

CANOPY ROAD

CORNELL PATH

WEST BROOKHAVEN FIREBREAK

BROOKHAVEN AVE

BLUE'S POND

POWER LINE ROAD

LONG ISLAND RAILROAD

EAST PRINCETON PATH

FAWN PATH

MIDDLE PATH

0 300 600 900 1200 FT.

LEGEND

- STORM SEWER LINE
- FM — FORCED MAIN
- HEAD WALL
- STORM TRENCH
- CB — CATCH BASIN
- MH — MANHOLE
- DW — DRY WELL
- CO — CLEAN OUT
- SG — STORM GRATES
- LP — LEACHING POOL
- SP- — SEWAGE PUMPING STATION

JOB NO	SHEET NO	REVISION	DATE	DWN.	APP'D.	OA

BROOKHAVEN
NATIONAL LABORATORY

UNDER CONTRACT WITH
UNITED STATES DEPARTMENT OF ENERGY
PLANT ENGINEERING DIVISION
UPTON, NEW YORK 11973

JOB TITLE: UTILITY SYSTEM MAP	DWG. TITLE: STORM SYSTEM MAP
R,P,GPP,LNR, NEM	DATE: 1-24-07
ACCT. NO.	SHEET OF 1 1
SCALE: AS NOTED	DWN. BY: NGB
JOB NO.	DWG. NO.
PROJ. OA	APP'D. BY
BLDG. NO.: SITE	
PATH:	

N

COLLIDER-ACCELERATOR DEPT (C-A.D.)

SEWAGE TREATMENT PLANT

WASTE MANAGEMENT FACILITY

NATIONAL WEATHER SERVICE

FORMER LWMF AREA

LABORATORY ENTRANCE

APARTMENT AREA

RHIC OUTER RING ROAD

RING ROAD

PINE BARK PATH

CRESCENT PATH

EAST MARGIN PATH

Z PATH

FOREST PATH

RANGE ROAD

S. TREATMENT PLANT PATH

EAST FIRE BREAK

WHITE PINE PATH

THORN HILL WAY

COMPOST CENTER

SHOTGUN WAY

FIRST ST.

WEST FIFTH FIRE BREAK

EAST FIFTH AVE.

PRINCE PATH

ASTRONOMY WAY

CANOPY ROAD

CORNELL PATH

WEST BROOKHAVEN FIREBREAK

BROOKHAVEN AVE

BLUE'S POND

POWER LINE ROAD

LONG ISLAND RAILROAD

EAST PRINCETON PATH

FAWN PATH

MIDDLE PATH

SOUTH APARTMENT FIRE BREAK

LEGEND

- G — GAS LINE
- ABANDONED GAS LINE
- NATURAL GAS LINE
- XXX-01 / OR — TANK - ABOVE GROUND
- XXX-01 / OR — TANK - BELOW GROUND
- XXX-01 — TANK - LOCATED IN BUILDING

0 300 600 900 1200 FT.

BROOKHAVEN NATIONAL LABORATORY

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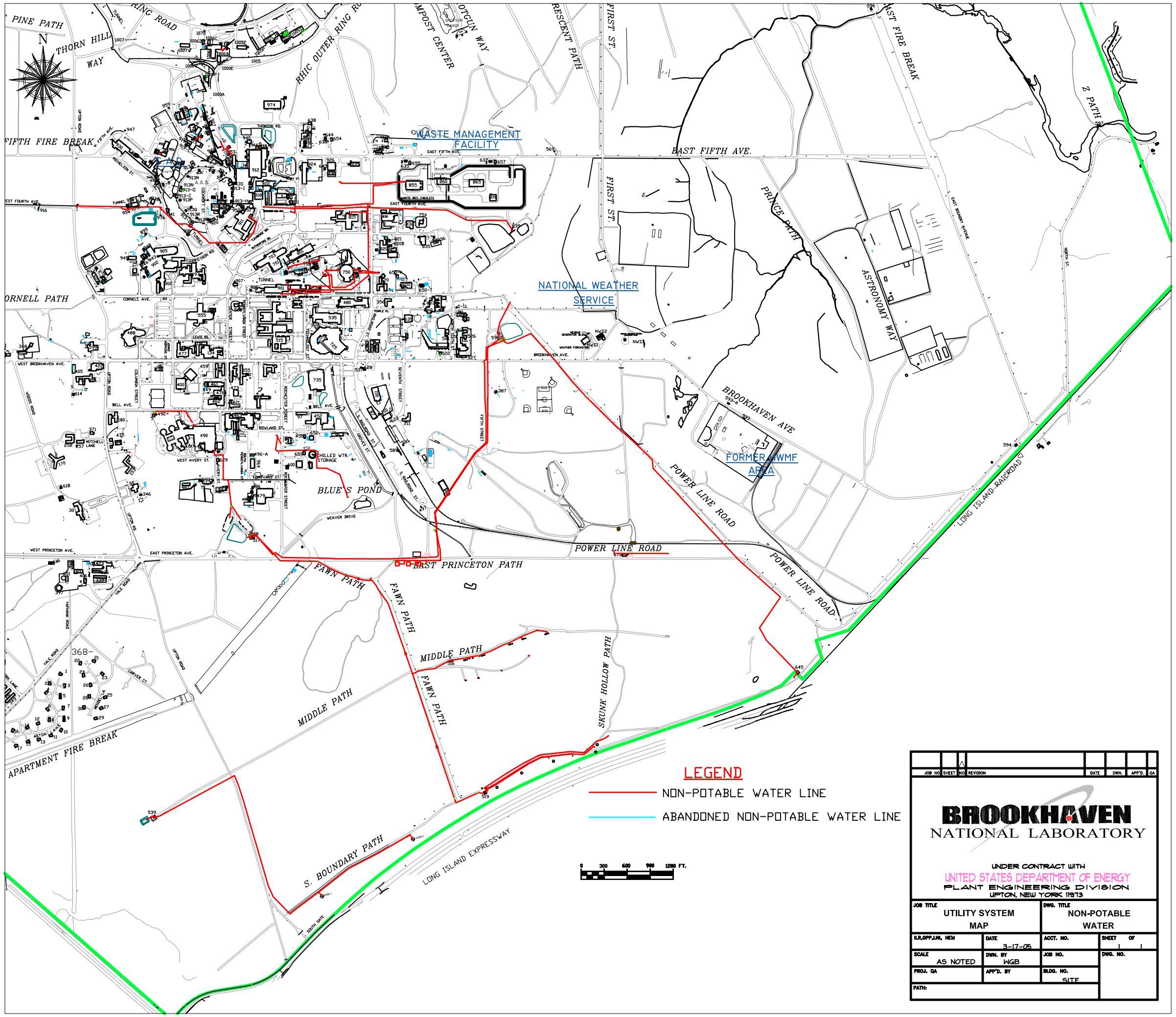
PLANT ENGINEERING DIVISION
UPTON, NEW YORK 11973

JOB TITLE: UTILITY SYSTEM MAP	DWG. TITLE: GAS/FUEL OIL DISTRIBUTION SYSTEM
SURVEYED, YEAR	DATE: 2-12-07
SCALE: AS NOTED	DWN. BY: MGB
FIELD BK.	APP'D. BY
PHOTO	
ASSOC. NO.	SHEET 1 OF 1
JOB NO.	DWG. NO.
FLOOR NO.	BLDG. NO. SITE



JOB NO.	SHEET NO.	REVISION	DATE	DWN.	APP'D.	QA
		△				

BROOKHAVEN NATIONAL LABORATORY

UNDER CONTRACT WITH
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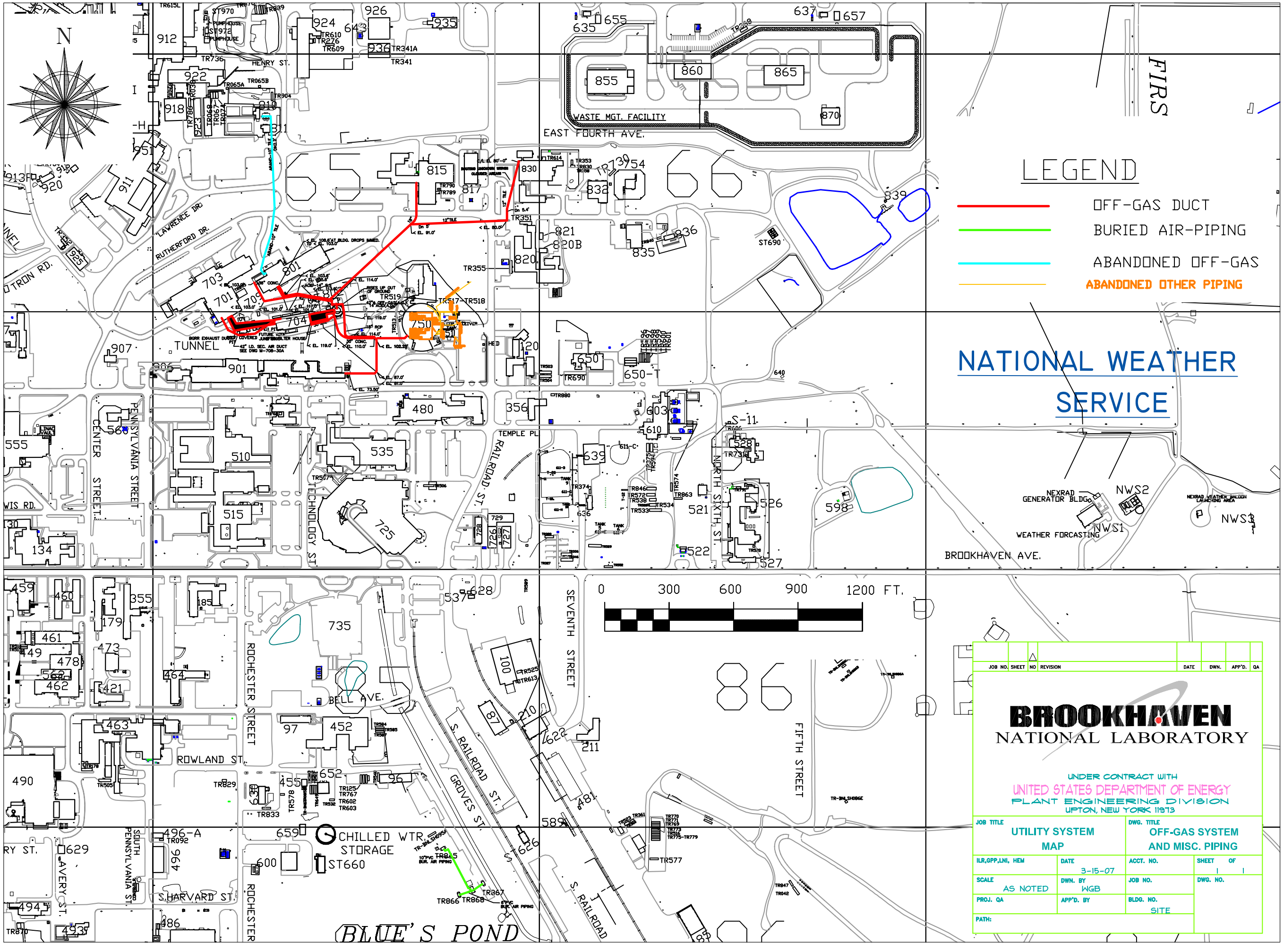
PLANT ENGINEERING DIVISION
UPTON, NEW YORK 11973

JOB TITLE: UTILITY SYSTEM MAP	DWG. TITLE: NON-POTABLE WATER

ILR,GPP,LINE, NEW	DATE: 3-17-05	ACCT. NO.	SHEET OF 1 1
SCALE: AS NOTED	DWN. BY: WGB	JOB NO.	DWG. NO.
PROJ. QA	APP'D. BY	BLDG. NO.: SITE	
PATH:			


N
LEGEND
OFF-GAS DUCT
BURIED AIR-PIPING
ABANDONED OFF-GAS
ABANDONED OTHER PIPING
NATIONAL WEATHER SERVICE
HENRY ST.
EAST FOURTH AVE.
WASTE MGT. FACILITY
LAWRENCE DR.
RUTHERFORD DR.
TUNNEL
TEMPLE PL
RAILROAD ST.
NORTH SIXTH ST.
CENTER STREET
PENNSYLVANIA STREET
TECHNOLOGY ST.
BROOKHAVEN AVE.
NEXRAD GENERATOR BLDG.
WEATHER FORCASTING
NWS1
NWS2
NWS3
SEVENTH STREET
FIFTH STREET
ROCHESTER STREET
BELL AVE.
ROWLAND ST.
S. RAILROAD ST.
GROVES ST.
SOUTH PENNSYLVANIA ST.
S. HARVARD ST.
AVERY ST.
CHILLED WTR STORAGE
ST660
BLUE'S POND
0 300 600 900 1200 FT.
BROOKHAVEN
NATIONAL LABORATORY
UNDER CONTRACT WITH
UNITED STATES DEPARTMENT OF ENERGY
PLANT ENGINEERING DIVISION
UPTON, NEW YORK 11973
JOB NO. SHEET NO REVISION DATE DWN. APP'D. QA
JOB TITLE
UTILITY SYSTEM MAP
DWG. TITLE
OFF-GAS SYSTEM AND MISC. PIPING
ILR,GPP,LNI, HEM
DATE 3-15-07
ACCT. NO.
SHEET OF 1 1
SCALE AS NOTED
DWN. BY WGB
JOB NO.
DWG. NO.
PROJ. QA
APP'D. BY
BLDG. NO. SITE
PATH:

APPENDIX 4

INTEGRATED FACILITIES AND INFRASTRUCTURE (IFI) CROSSCUTS

This section has the following IFI Crosscuts which were modified from the version submitted with the FY08 budget based on the DOE's guidance for the Ten-Year Site Plan:

- Office of Science
- Office of Environmental Management

FY 2009-2018 CRP
Integrated Facilities and Infrastructure Budget Crosscut

Integrated Facilities and Infrastructure Budget Data Sheet (IFI)	Deferred Maintenance Reduction (000)	Gross Building Area Added	Gross Building Area Removed	FY 07 Approp. ($000)	FY 08 to Congress ($000)	FY 09 Budget ($000)	FY 10 Budget ($000)	FY 11 Budget ($000)	FY 12 Budget ($000)	FY 13 Budget ($000)	FY 14 Budget ($000)	FY 15 Budget ($000)	FY 16 Budget ($000)	FY 17 Budget ($000)	FY 18 Budget ($000)
SITE NAME: Brookhaven National Lab															
PROGRAM: Science															
1.0 Capital Line Item (Include project number & identify Funding Program)															
1.1 New Construction (facilities and additions)															
Interdisciplinary Science Building I	2,278	93,000	120,024			8,240	23,300	28,000	6,760						
Interdisciplinary Science Building II	1,413	97,000	100,259						11,000	23,000	32,000	3,700			
Support Shops Complex	1,576	85,000	100,976								12,000	24,500	6,300		
Central Computing Building	339	27,000	24,405											6,584	20,443
Subtotal 1.1	5,606	302,000	345,664	-	-	8,240	23,300	28,000	17,760	23,000	44,000	28,200	6,300	6,584	20,443
1.2 All Other Projects (recap)											-				
Renovate Science Labs Ph I	14,400	0	0	4,600	8,200	5,200									
Renovate Science Labs Ph II	15,000	0	0				5,000	11,000	22,000	12,000					
Utilities Improvements	20,000	0	0									4,000	21,500	12,500	
Renovate Science Labs Ph III	15,000	0	0												14,000
Subtotal 1.2	64,400	0	0	4,600	8,200	5,200	5,000	11,000	22,000	12,000	-	4,000	21,500	12,500	14,000
1.3 Program Line Items that Add Space Conventional $ Only															
Electron Beam Ion Source (PED and Construction)	0	2,400	0	950											
BNL Center for Functional Nanomaterials (PED and Construction)	0	94,500	0	8,470											
National Synchrotron Light Source II (PED and Construction)	0	425,000	0	2,000	11,000	24,000	65,000	74,000	37,000	5,000	2,000				
RHIC II (PED and Construction)	0	9,300	0			2,000	5,000								
Subtotal 1.3	0	531,200	0	11,420	11,000	26,000	70,000	74,000	37,000	5,000	2,000	-	-	-	-
Subtotal Line Item Projects 1.0 (1.1+1.2+1.3)	**70,006**	**833,200**	**345,664**	**16,020**	**19,200**	**39,440**	**98,300**	**113,000**	**76,760**	**40,000**	**46,000**	**32,200**	**27,800**	**19,084**	**34,443**
2.0 General Plant Project (GPP) (Include project number & identify Funding Program)															
2.1 New Construction KB Landloard additions															
B/817 Addition	0	8,000	0	700											
Central Chilled Water Plant Addition (Completed under 3.1)	0	0	0		1,129										
Brookhaven Computing Facility Expansion, B/515	0	6,000	0		4,500										
Material Handling Facility	0	9,300	0	1,405	595										
Subtotal 2.1	0	23,300	0	2,105	6,224	-	-	-	-	-	-	-	-	-	-
2.2 All Other Landlord GPP Projects (recap)															
AGS MMPS Loss Prevention & Containment	0			310											
Expand BCF Infrastructure, B/515	0			300											
Smoke Detection B/515 BCF Under Floor and Above	0			10											
Install A/C RHIC Power Supply Houses	0			350											
New 10" Water Main at Rutherford & Cornell	325			325											
Security System Improvements	0			150											
Lighting Contactors	0			248											
Modifications for ADA Compliance, Phase III	0			50											
B/801 Off-Gas Stack Replacement	0			20											
B/490 New Passageway	0			10											
B/515 Room M1-150 Lab Upgrades	0			650											
Computing Facility Power and Cooling Upgrades	0			150											
Computing Infrastructure Improvements, FY07	0			440											
Eyewash and Safety Shower Upgrade	0			200	200										
Install Remote Ground Fault Monitoring, Site	0			1,040											

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Integrated Facilities and Infrastructure Budget Data Sheet (IFI)	Deferred Maintenance Reduction (000)	Gross Building Area Added	Gross Building Area Removed	FY 07 Approp. ($000)	FY 08 to Congress ($000)	FY 09 Budget ($000)	FY 10 Budget ($000)	FY 11 Budget ($000)	FY 12 Budget ($000)	FY 13 Budget ($000)	FY 14 Budget ($000)	FY 15 Budget ($000)	FY 16 Budget ($000)	FY 17 Budget ($000)	FY 18 Budget ($000)
SITE NAME: Brookhaven National Lab															
PROGRAM: Science															
Upgrade Lab #5, B/830	425			50	375										
Modify Room 112, B/555 for Hot Isostatic Press	0			50	300										
Backflow Preventors - B/901	0			32	218										
Install New Groundwater Monitoring Wells at Waste Management Fac.	0			60											
Subtotal 2.2	750			4,445	1,093	-	-	-	-	-	-	-	-	-	-
2.3 Program GPP - KB B&R															
Install A/C RHIC Power Supply Houses	0					700									
Electrical System Improvements, B/515	0					1,300	1,300								
Modernization of the Vertical Cryogenic Test Facility	0						400								
Cable Tray Upgrade C-A Department	0							400							
New Transformer #9	0							840	960						
B/936 Insulate and Heat	0							40							
Elimination of Rad Cooling Water at B/914	0									600					
Upgrade AGS Power Distribution System Fan House A	200								200						
Upgrade AGS Power Distribution System Fan House B	200									200					
Upgrade AGS Power Distribution Fan House C, D, E	800										600				
Upgrade AGS Power Distribution System North Target Building	200									200					
Subtotal 2.3	1400			-	-	2,000	1,700	1,280	1,160	1,000	600	-	-	-	-
2.5 Program GPP KC B&R (recap)															
Liquid Nitrogen Conduit Infrastructure for NSLS X-Ray ring	0						300	220							
Subtotal 2.4	0			-	-	-	300	220	-	-	-	-	-	-	-
Subtotal GPP Projects 2.0 (2.1+2.2+2.3+2.4)	2150			6,550	7,317	2,000	2,000	1,500	1,160	1,000	600	-	-	-	-
3.0 Institutional General Plant Project (IGPP) (Include project number & identify Funding Program)															
3.1 New Construction (facilities and additions)															
Central Chilled Water Plant Addition	0	16,000	0			3,771									
Office Addition, B/463	0	3,000	0			250	750								
Main Gate Access Facility	0	2,000	0			1,000	2,000								
New Guard Booths, Utility/Access Improvements, Main Gate	0	200	170						434	1,366					
Mail Room/Post Office Addition to B/488	0	4,000	0						2,700						
Subtotal 3.1	0	25,200	170	-	-	5,021	2,750	-	3,134	1,366	-	-	-	-	-
3.2 All other IGPPs															
B/801 Off-Gas Stack Replacement	0					750									
C-A Tritiated Cooling Water System Modifications	0						450								
C-A Area Storm Water Improvements	0					299	482								
Eyewash and Safety Shower Upgrade	0					200	200	200	200	200	200	200	200		
Security System Improvements 08 - 10	0					100	50								
Modifications for ADA Compliance 08 - 10	0					100	50								
User Support Projects FY08 - 10	0					100	50								

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SITE NAME: Brookhaven National Lab															
PROGRAM: Science															
Backflow Preventors - Backlog	0					250	250	250	250	250					
Replace Fire Alarm Control Panel, B/911 Annex	0							312							
Replace Fire Alarm Control Panel, B/510 Loading Platform	0							155							
BCF Emergency Power And HVAC Disconnection System	0							200							
Princeton/Upton Intersection and Signal Improvements	0							750							
Provide Electrical Service to North Gate for Security	0							550							
Air Condition Meeting Space - North Room Brookhaven Center	0							656							
Fiber Cable WWTF: Update Ethernet Control System	0							100							
Corrective Actions to Part 851 Gap Analysis Report	0						977	1,000	421	1,652					
Connection of Well 102 to Supply System	0							300							
CCWF Tower Blowdown Modification	0							50							
Site Emergency Generator Resistive Loadbank	0							390							
Security System Improvements FY11 - 13	0							50	50	50					
Modifications for ADA Compliance FY11 - 13	0							50	50	50					
User Support Improvements FY11 - 13	0							50	50	50					
Increase CCWF Cooling Tower Capacity	0						1,800								
Vehicle Arrestor Systems Main Gate	0							414							
Upgrade of Labs 2-115, 2-116 and 2-117, B/510	0							313	1,072						
Convert Shop Room to Lab, B/480	0							500							
HV/High Current Equipment R&D Lab, B/911 Room 112A	0							500	600						
Buffered Chemical Polishing Facility, B/912	0							366	1,734						
Renovation of Biology Department Library	0							150							
B/463 Renovation of Lab 116	500									500					
Vacuum Coating Development Lab, B/905	0									600					
Hazardous Material Protection - Security Improvements Phase I	0									150					
Temperature/Humidity Control Modifications, PC Lab B/535	0									130					
New Traffic Lights at Main Gate	120									120					
BNL Vehicle Radiation Monitor Replacement	0									100					
Replace 6" Piping North of B/905, Hydrant 243	233									233					
Security Improvements to Water System	0									150					
Relocate External Air Intake, B/535	0									50					
Neutron Detector Test Facility	0									500					
Lighting Improvements to B/488 Dining/Serving Area	0									16	34				
Asbestos Abatement B/488	0									608					
Infection Control Modifications to B/599	0									300					
Rupture Disk Relief Valves - R-11 Chillers	0									126					
Emergency Power B/30 and B/321	0									200					
B/479 Air Conditioning Phase II	0									425					
Site Fire Alarm System: Fiber Optic Cable Upgrades	0										525				
Sanitary Main Radiation/pH Level Detection Systems	0										700				
Ductless A/C B/535 Rooms B-108A, B-108B, B-113, B-113A	0										45				
Fire Suppression System Maintenance Area - CAA Upgrade	0										75				
Extend Steam Main to B/422 and B/244	0										150				
Water Main Replacement - Technology Street	0										567	345			
Security Improvements B/449	0										250				

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SITE NAME: Brookhaven National Lab															
PROGRAM: Science															
Rework of Circular Drive, B/725 Main Entrance	0										60				
Install A/C Lower Lobby, B/30	0										300				
Construct Elevator room Fire-Rated Enclosures	0										50				
Collider Accelerator Steel Yard Paving	0										200				
Acoustical Improvements, Conference Room B, B/488	0										54				
13.8 kV Distribution System Reinforcement Phase I	0										190	703			
Site Entrance Road	0										4,700				
Main Gate Improvements	0											2,000			
Various Projects	0											5,136	8,477	8,981	9,295
Subtotal 3.2	**853**	-	-	-	-	**1,799**	**4,309**	**7,306**	**4,427**	**6,460**	**8,100**	**8,384**	**8,677**	**8,981**	**9,295**
Subtotal IGPP Projects 3.0 (3.1+3.2)	**853**	**25,200**	**170**	-	-	**6,820**	**7,059**	**7,306**	**7,561**	**7,826**	**8,100**	**8,384**	**8,677**	**8,981**	**9,295**
4.0 Operating/Expense for Excess Elimination and Other															
4.1 Excess Elimination (demolition, sale, lease, transfer) Show area eliminated in Gross Area column															
RSB- B/209 Demolition	164		14,164	300											
Excess Facilities-FY07 B/650A, B/650 Phase I	47		1,246	697											
Excess Facilities-FY08 B/87, 211, 481, 629	660		15,688		650										
ISD I - B/51,130,179,185,355,421,462,526	2,278,489		120,024							7,300					
ISD II - B/120,197,464,473,490(part), 902(part)	1,413,346		100,259										6,100		
Shops - B/97,134,244,346,405,422,452,455,528 & 652	1,576,094		100,976											6,200	
Subtotal 4.1	**5268800**	-	**352,357**	**997**	**650**	-	-	-	-	**7,300**	-	-	**6,100**	**6,200**	-
4.2 All Other (List direct O&E maintenance under 5.1)															
None															
Subtotal 4.2	0		-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal 4.0			**352,357**	**997**	**650**	-	-	-	-	**7,300**	-	-	**6,100**	**6,200**	-
Total Capital & Operating Investment (1.0+2.0+3.0+4.0):	**73,009**	**858,400**	**698,191**	**23,567**	**27,167**	**48,260**	**107,359**	**121,806**	**85,481**	**56,126**	**54,700**	**40,584**	**42,577**	**34,265**	**43,738**
Total Overhead Investments (IGPP)	**853**	**25,200**	**170**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**

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Integrated Facilities and Infrastructure Budget Data Sheet (IFI)	Gross Building Area	FY 07 Approp. ($000)	FY 08 to Congress ($000)	FY 09 Budget ($000)	FY 10 Budget ($000)	FY 11 Budget ($000)	FY 12 Budget ($000)	FY 13 Budget ($000)	FY 14 Budget ($000)	FY 15 Budget ($000)	FY 16 Budget ($000)	FY 17 Budget ($000)	FY 18 Budget ($000)
SITE NAME: Brookhaven National Lab													
PROGRAM: Science													
5.0 Maintenance & Repair													
5.1 Direct Funded (by HQ or Site Program)													
High Energy Physics		40	41	43	44	46	48	49	51	53	55	56	58
Nuclear Physics		1,150	1,190	1,232	1,275	1,320	1,366	1,414	1,463	1,514	1,567	1,622	1,679
Basic Energy Science		340	352	364	377	390	404	418	433	448	463	480	496
Basic Energy Science		3	3	3	3	3	4	4	4	4	4	4	4
Biological & Environmental Research		40	41	43	44	46	48	49	51	53	55	56	58
Safeguard & Security		80	83	86	89	92	95	98	102	105	109	113	117
Groundwater Projects (LTRA)		-	-	-	-	300	311	286	297	307	319	330	340
BGRR (LTRA)		-	-	-	-	269	276	283	291	298	306	313	322
HFBR (LTRA)		-	-	-	-	488	498	508	519	529	540	551	568
5.1. Deferred Maintenance Reduction (Direct Funded)													
None													
Sub-Total Direct Maintenance & Repair		**1,653**	**1,711**	**1,771**	**1,833**	**2,954**	**3,048**	**3,109**	**3,209**	**3,312**	**3,418**	**3,526**	**3,643**
5.2 Indirect Maintenance & Repair													
5.2.1 Indirect (from Overhead or Space Charges)													
PE Maintenance Budget		20,930	22,222	23,111	24,035	24,996	25,996	26,906	27,848	28,822	29,831	30,875	31,956
Chargeback from non-Cap		1,601	1,707	1,775	1,846	1,920	1,997	2,067	2,139	2,214	2,292	2,372	2,455
Other Divisions Indirect Maintenance		546	569	592	614	639	664	687	711	736	762	789	816
Indirect O/E maintenance projects													
Replace Outlet Strips Under Aluminum Frame Windows													
Roof Replacement B/480 Hi-Bay Balance													
Roof Replacement B/555 N/E Corner & Rear Elevator Room		91											
Roof Replacement B/490 Block 5		318											
Renovation of Lab W3,W5A&W5B, B703		22	421	667									
Steam System Repairs MH44		4											
Steam System Repairs MH24		7											
Rebuild Cooling Tower B/600 CCWF		350											
Correction of OSHA Deficiencies - Maintenance		339	1,004	1,196									
Repair of WM Reclamation Area Stacks, B/865		4											
Renovate Lab 9-801, B/490			221										
Renovate Lab Suite 267/270, B/463		1											
Replacement of Critical HVAC Systems, ATF B/820			267										
Heat Detector Replacement Project Site-Wide		277											
Replace Fire Alarm Panel B/921 and B/449		32											
Emergency Power Replacement B/490		72											

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SITE NAME: Brookhaven National Lab													
PROGRAM: Science													
Eastern Potable Water Well Field Rehab													
B/902 Roof Replacement MG Room		117											
Repave B/490 Parking Lot		26											
User Improvements - Gym Floor Rehab		44											
Upgrade Labs W6 & W8, B/703		62											
Upgrade 480V Breakers with Solid State Trip Devices													
Emergency Power B/463		17											
Emergency Power B/912 Phase I		12	400										
Upgrade B/463 Elevator				149									
Upgrade B/725 S. Westinghouse Elevator					230								
Repair Steam Main Servicing B/560													
Atlas Physics Analysis Center													
Replace Fire Alarm Panel B/50		120											
Repair/Replace Roof, B/912 EEA & EEBA			700	615									
Roof Replacement B/490 Block 2					110								
Roof Replacement B/490 Block 3					110								
Roof Replacement B/911 Bal Floor 3					290								
Roof Replacement B/703 Center Section					250								
Renovate Lab 220, B/463				184	621								
Steam System Repairs MH 23/23A					350								
Renovate Lab Suite 164/167, B/463					204	579							
Damper Corrosion Remediation, B/555 Balance						582							
Damper Corrosion Remediation, B/555 K-6					142								
Damper Corrosion Remediation, B/555 A/H					150								
Rehab Space for Labs, B/725						229	796	296	941				
RHIC & AGS Main Control Room Renovation							700	1,350					
Rehab B/510 Freight Elevator						240							
Replace 3 Liebert A/C Units, B/459					125								
Renovate Lab Science Teacher Development Program B/801						100							
Chiller Replacement B/928					380								
Chiller Replacement B/930						435							
Chiller Replacement B/488							250						
Replace Paging Antennas, Met Tower					100								
Air Handler Replacements K-7, B/555					250								
Replace Outdoor Power Distribution Panels, CAD						500							
Air Handler Replacements AC-3, B/510							300						
Air Handler Replacements K-5, B/555								300					

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SITE NAME: Brookhaven National Lab													
PROGRAM: Science													
Air Handler Replacements, LV-2, B/490									290				
Window Repairs, B/515						50							
Chiller Replacement, B/729 SDL								525					
Replace of New A/C Equipment (5) AGS Fan Houses							425						
RHIC Repaving B/1006E, 1007W, 1008B Areas						190							
Replace Site Fire Alarm Panel Modems									80				
Structural Modifications of Wood Buildings Phase II									65	79			
Replace Supplemental A/C, B/555									70				
PCB Electric Ballast Replacement Phase I									195				
Site Siren Replacement									140				
Renovate Lab Suite 117, B/463									185	515			
Replace Boiler at Brookhaven Center, B/30									80				
Electrical Distribution Panel Labeling									200	200	200	200	555
Rehab Space for Training Rooms, B/197									225				
Repair Loading Dock, B/488										160			
Replace Distilled Water System, B/463										151			
Renovate Lab Suite 182, B/463										149	351		
Renovate Lab Suite 284, B/463											150	350	
Replace 3 Cargo Storage Boxes										125			
Replacement of Cooling Tower #4 at AGS										225			
Repair Sagging Foundation - Public Service Station										28			
B/610 Exterior Repairs										450			
Paint 300,000 Gallon Elevated Water Tank B/49										389			
Patio Resurfacing - B/30											60		
Update Control System Interface/Graphics											58		
Gutter Screens for Frame Buildings											50		
CCWF - Air Compressor Driers											50		
Correct Fire Wall Penetrations - B/463											35		
Fire Door Upgrades, Various Buildings											90		
Thermoplastic Road Markings Sitewide											50		
Electrical Isolation OD SMES Trailer B/725											92		
New Alternate Line & 69kV Breakers											941	1,456	1,603
Domestic Water Building Isolation Valves, Various											50		
Convert Boiler 1A to Natural Gas											60		
B/317 Rehab											100		
Refurbish Chemistry Department Glass Washing Laboratory												25	
Protective Cover Over Gas Dispensing Island - BNL Auto											134		

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SITE NAME: Brookhaven National Lab													
PROGRAM: Science													
B/535 Air Conditioning for Room B-148												25	
Boiler 1A Retube the Front Half												120	
Replace O/H Electric Lines W/UG Cable Harvard												175	
Replace Skirting & Foundation Vents, Various Buildings												50	
B/464 Replace 2 Water Cooled A/C Units												70	
Replace Existing Sidewalks and Provide ADA Access													250
East Gate Emergency Evacuation Route													63
Sub-Total Indirect (from Overhead or Space Charges)		**24,992**	**27,511**	**28,289**	**29,807**	**30,460**	**31,128**	**32,131**	**33,169**	**34,244**	**35,356**	**36,507**	**37,698**
5.2.2 Deferred Maintenance Reduction													
Roof Replacement		1,000	1,000	2,500	3,500	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000
Science Lab Rehab Site		1,340	1,513	2,067	2,630	3,130	3,130	3,130	3,130	3,130	3,130	3,130	3,130
Air Handler Replacements		700	500	1,000	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500
Replace Fire Alarm Panels		500	750	900	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200
Rehab Hydraulic Elevators		500	500	500	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Chiller Replacements		500	500	1,000	1,375	1,400	1,400	1,400	1,400	1,400	1,400	1,400	1,400
Steam Manhole Repairs Sitewide		600	900	1,200	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500
Rehab High/Medium Voltage Circuit Breakers Site		400	750	380									
Retrofit 480V Breakers W/Solid State Trip Devices		400	750	900	1,025								
Sub-Total Deferred Maintenance Reduction		**5,940**	**7,163**	**10,447**	**13,730**	**13,730**	**13,730**	**13,730**	**13,730**	**13,730**	**13,730**	**13,730**	**13,730**
Sub-Total Indirect Maintenance & Repair		**30,932**	**34,674**	**38,736**	**43,537**	**44,190**	**44,858**	**45,861**	**46,899**	**47,974**	**49,086**	**50,237**	**51,428**
TOTAL Maintenance and Repair		**32,585**	**36,385**	**40,507**	**45,370**	**47,144**	**47,906**	**48,970**	**50,108**	**51,285**	**52,503**	**53,762**	**55,071**
6.0 Indirect O&E Excess Elimination (demolition, sale, lease, transfer) Show area eliminated in Gross Area column													
B/96 Demolition	5,591	160											
B/100 Demolition	13,947		420										
B/210 Demolition	5,460		150										
B/475 Demolition	24,737			750									
Total Indirect Excess Elimination	49,735	160	570	750	-	-	-	-	-	-	-	-	-

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Integrated Facilities and Infrastructure Data Sheet (IFI)	Project Number	Gross SF Removed	FY 06 Sq. Ft.	FY 07 Sq. Ft.	FY 08 Sq. Ft.	FY 09 Sq. Ft.	FY 10 Sq. Ft.	FY 11 Sq. Ft.	FY 12 Sq. Ft.	FY 13 Sq. Ft.	FY 14 Sq. Ft.	FY 15 Sq. Ft.	FY 16 Sq. Ft.	FY 17 Sq. Ft.	FY 18 Sq. Ft.
SITE NAME: Brookhaven National Lab															
PROGRAM: Science															
7.0 Area of Excess Eliminated for all categories															
List of projects, by type of funding, with project number, and excess AREA eliminated by fiscal year accomplished.															
Line Item															
Research Support Building	AA0D0030	20,148	14,164												
ISD I - B/51,130,179,185,355,421,462,526	09-SC-03	120,024								120,024					
ISD II - B/120,197,464,473,490(part), 902(part)	AA1D0012	100,259											100,259		
Shops - B/97,123,244,346,405,422,452,455,528 & 652	AA1D0009	100,976												100,976	
Subtotal Line Items		341,407	14,164	0	0	0	0	0	0	120024	0	0	100259	100,976	0
GPP															
None															
Subtotal GPP		-	0	0	0	0	0	0	0	0	0	0	0	0	0
IGPP															
New Guard Booths	AA6D0013	170							170						
Subtotal IGPP		170	0	0	0	0	0	0	170	0	0	0	0	0	0
Operations/Expense															
Excess Facilities-FY06 B/86, 422A, 482, 628, 649	N98D0099	19,492	19,492												
Excess Facilities-FY07 B/650A, B/650 Phase I	N98D0099	1,246		1,246											
Excess Facilities-FY08 B/87, 211, 481, 629	N98D0099	15,688			15,688										
Subtotal Block 4.1		36,426	19,492	1,246	15,688	-	-	0	0	0	0	0	0	0	-
Indirect Operations/ Expense															
B/96 Demolition	Work Order	5,591		5,591											
B/100 Demolition	Work Order	13,947			13,947										
B/210 Demolition	Work Order	5,460			4,928										
B/475 Demolition	Work Order	24,737				24,737									
Subtotal Block 6.1		49,735	0	5,591	18,875	24,737	0	0	0	0	0	0	0	0	0
Transfer by sale or lease, or transfer to an outside federal agency															
None															
Subtotal Transfer or Lease		-	0	0	0	0	0	0	0	0	0	0	0	0	0
Subtotal 7.1 Spece Removed		427,738	33,656	6,837	34,563	24,737	-	-	170	120,024	-	-	100,259	100,976	-
	Project Number	**Gross SF Added**	**FY 06 Sq. Ft.**	**FY 07 Sq. Ft.**	**FY 08 Sq. Ft.**	**FY 09 Sq. Ft.**	**FY 10 Sq. Ft.**	**FY 11 Sq. Ft.**	**FY 12 Sq. Ft.**	**FY 13 Sq. Ft.**	**FY 14 Sq. Ft.**	**FY 15 Sq. Ft.**	**FY 16 Sq. Ft.**	**FY 17 Sq. Ft.**	**FY 18 Sq. Ft.**
7.2 Total Area to be Added by GPP, IPP & LI Construction															
Line Item															
Research Support Building	AA0D0030	64,347		64,347											
BNL Center for Functional Nanomaterials	AA1D0005	94,500			94,500										
Electron Beam Ion Source	P98D0025	2,400			2,400										
Interdisciplinary Science I	09-SC-03	93,000								93,000					
RHIC II	AA6D0022	9,300								9,300					
National Synchrotron Light Source II	AA6D0021	425,000										425,000			
Interdisciplinary Science II	AA1D0012	97,000											97,000		
Support Shops Complex	AA1D0009	85,000												85,000	
Subtotal Line Items		870,547	-	64,347	96,900	-	-	-	-	102,300	-	425,000	97,000	85,000	-
GPP															

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B/817 Addition	AA6D0082	8,000		8,000											
Materials Handling Facility	AA6D0066	9,300			9,300										
Brookhaven Computing Facility Expansion, B/515	AA1D0032	6,000				6,000									
Subtotal GPP		23,300	-	8,000	9,300	6,000	-	-	-	-	-	-	-	-	-
IGPP															
Central Chilled Water Plant Addition	N98D0069	16,000				16,000									
Office Addition, B/463	AA6D0032	3,000					3,000								
Main Gate Access Facility	AA6D0043	2,000					2,000								
New Guard Booths, Utility/Access Improvements, Main Gate	AA6D0013	200							200						
Mail Room/Post Office Addition to B/488	AA7D0041	4,000							4,000						
Subtotal IGPP		25,200	-	-	-	16,000	5,000	-	4,200	-	-	-	-	-	-
Subtotal 7.2 Area Added		919,047	-	72,347	106,200	22,000	5,000	-	4,200	102,300	-	425,000	97,000	85,000	-

Integrated Facilities and Infrastructure Budget Data Sheet (IFI)	Project Number	Gross Building Area	FY 06 Approp. ($000)	FY 07 Approp. ($000)	FY 08 Approp. ($000)	FY 09 Approp. ($000)	FY 10 Approp. ($000)	FY 11 Approp. ($000)	FY 12 Approp. ($000)	FY 13 Approp. ($000)	FY 14 Approp. ($000)	FY 15 Approp. ($000)	FY 16 Approp. ($000)	FY 17 Approp. ($000)	FY 18 Approp. ($000)
SITE NAME: Brookhaven National Lab															
PROGRAM: Environmental Management															
1.0 Capital Line Item															
1.1 New Construction (facilities and additions)															
None															
1.2 All Other Projects (recap)															
None															
Subtotal Line Item Projects			-	-	-	-	-	-	-	-	-	-	-	-	-
2.0 General Plant Project (GPP)															
2.1 New Construction (facilities and additions)															
None															
2.2 All Other Projects (recap)															
None															
Subtotal GPP:			-	-	-	-	-	-	-	-	-	-	-	-	-
3.0 Institutional General Plant Project (IGPP)															
None															
Subtotal IGPP Projects		-	-	-	-	-	-	-	-	-	-	-	-	-	-
4.0 Operating/Expense for Excess Elimination and Other															
4.1 Excess Elimination (demolition, sale, lease, transfer) Show area eliminated in Gross Area column															
Demo of building 715, 753, 707A, 707B (Completed in FY06	EZ5012300	1,813	1,475	-											
Demo of building 802/704	EZ5012300	11,146		-	-	73	4,372								
4.1 Subtotal			1,475	-	-	73	4,372	-	-	-	-	-	-	-	-
4.2 All Other Direct(List direct O&E maintenance under 5.1)															
None															
4.2 Subtotal			-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Operating/Expense Projects															
TOTAL Capital & Operating Investment:			1,475	-	-	73	4,372	-	-	-	-	-	-	-	-
TOTAL Overhead Investments (IGPP)			-	-	-	-	-	-	-	-	-	-	-	-	-

Integrated Facilities and Infrastructure Budget Data Sheet (IFI)	**Project Number**	**Gross Building Area**	**FY 06 Approp. ($000)**	**FY 07 Approp. ($000)**	**FY 08 Approp. ($000)**	**FY 09 Approp. ($000)**	**FY 10 Approp. ($000)**	**FY 11 Approp. ($000)**	**FY 12 Approp. ($000)**	**FY 13 Approp. ($000)**	**FY 14 Approp. ($000)**	**FY 15 Approp. ($000)**	**FY 16 Approp. ($000)**	**FY 17 Approp. ($000)**	**FY 18 Approp. ($000)**
SITE NAMEBrookhaven National Lab															
PROGRAM: Environmental Management															
5.0 Maintenance & Repair															
5.1 Direct Funded (by HQ or Site Program)															
EX - Environmental Management - Non Defense			-	-											
List direct O/E maintenance projects															
BGRR	EZ5012400		400	380	330	342	352								
HFBR	EZ5012410		239	246	254	261	269								
ER Groundwater Projects	EZ5012300		563	452	462	477	491								
Total Direct Maintenance & Repair (Note 1)			1,202	1,078	1,046	1,080	1,112	-	-	-	-	-	-	-	-
5.2 Indirect (from Overhead or Space Charges)			-	-	-	-	-	-	-	-	-	-	-	-	-
Total Indirect Maintenance & Repair			-	-	-	-	-	-	-	-	-	-	-	-	-
6.0 Indirect O&E Excess Elimination (demolition, sale, lease, transfer) Show area eliminated in Gross Area column															
None		-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Indirect Excess Elimination		-	-	-	-	-	-	-	-	-	-	-	-	-	-
Note 1	EM Groundwater, BGRR and HFBR projects transfer from EM to SC in FY11														

Integrated Facilities and Infrastructure Budget Data Sheet (IFI)	**Project Number**	**Gross Building Area**	**FY 06 Approp. ($000)**	**FY 07 Approp. ($000)**	**FY 08 Approp. ($000)**	**FY 09 Approp. ($000)**	**FY 10 Approp. ($000)**	**FY 11 Approp. ($000)**	**FY 12 Approp. ($000)**	**FY 13 Approp. ($000)**	**FY 14 Approp. ($000)**	**FY 15 Approp. ($000)**	**FY 16 Approp. ($000)**	**FY 17 Approp. ($000)**	**FY 18 Approp. ($000)**
SITE NAMEBrookhaven National Lab															
PROGRAM: Environmental Management															
7.0 Area of Excess Eliminated															
List of projects, by type of funding, with project number, and excess AREA eliminated by fiscal year accomplished.															
Line Item															
None															
GPP															
None															
IGPP															
None															
Operations/Expense															
None															
Indirect Operations/ Expense															
Demo of building 715, 753, 707A, 707B (completed in FY06)	EZ5012300	1,813	1,813												
Demo of building 802/704	EZ5012300	11,146					11,146								
Transfer by sale or lease, or transfer to an outside federal agency															
None															
Subtotal of Excess Facility Area Eliminated		12,959	1,813	-	-	-	11,146	-	-	-	-	-	-		-
None															
Total Area to be Added by GPP, IGPP, and LI Construction (List Area Under Occupancy Year)		-	-	-	-	-	-	-	-	-	-	-	-	-	-

APPENDIX 5
LINE ITEM PROJECTS

E5.0 Introduction

This section provides details of BNL's ongoing and proposed Line Item construction projects. Table 5-1 shows the relationship of the BNL proposed projects to the DOE-SC Infrastructure Initiative objectives.

Table 5-1 Proposed SLI Projects Relationship to the Objectives of the DOE-SC Infrastructure Initiative

BNL PROJECTS	DOE INFRASTRUCTURE OBJECTIVE				
	Right-Sized	Preferred Working Environment	Safe, Healthy, Secure	Information Infrastructure	Efficient
Renovate Science Laboratories I		X	X	X	X
Interdisciplinary Science Building Ph I	X	X	X	X	X
Renovate Science Laboratories II		X	X	X	X
Interdisciplinary Science Building Ph II	X	X	X	X	X
Support Shops I	X	X	X		X
Utilities Improvement I			X		X
Central Computer Building	X	X	X	X	X
Renovate Science Laboratories III		X	X	X	X

E5.1 Ongoing SLI Projects

Project: Renovate Science Laboratories I
TEC: $18M
Funding Profile: FY07 $4.6M, FY08 $8.2M, FY09 $5.2M
Space Added: None **Space Removed:** None **Space Rehabilitated:** 19,600 SF
Scope: This project will revitalize and modernize laboratories located in Buildings 480 Material Science; and 815 Multi-program Lab/Office Building. Renovated space totals 20,000 square feet. The scope of refurbishment will include HVAC, fume hoods, electrical, lighting, plumbing, and interior finishes. Collaborative research teams from multiple science programs will use the renovated laboratories. Modern modular laboratory equipment will be used, wherever possible, to provide maximum lab flexibility increasing the potential for reuse. Lab furniture and casework has deteriorated to the point of no longer being functional. The floors, walls and ceilings are severely worn, and in some cases will require lead and asbestos abatement. Plumbing systems are failing and in some instances harbor legacy contamination that presents an environmental liability. Many of the windows leak and laboratories do not conform to current standards.

E5.2 Proposed SLI Projects

Project: Interdisciplinary Science Building Ph I
TEC: $66.3M (at-year $)
Funding Profile: FY09 $8.24M, FY10 $23.3M, FY11 $28M, FY12 $6.76M
Space Added: 95,000 SF **Space Removed:** 120,024 SF
Scope: This project will construct a sustainable 93,000 SF building with high accuracy labs and offices. Design emphasis will be to foster and stimulate collaborative research. Efficient, high accuracy HVAC systems will be installed to support cutting edge experimentation and the operation of sensitive instrumentation. This type of space is limited at BNL and forces collaborative efforts into ad-hoc, sub-standard facilities which often limits the research. Approximately 120,000 SF will be demolished. Tenants will come from existing permanent science buildings and from older wood and masonry building which will be demolished.

Project: Renovate Science Laboratories II
TEC: $50M (at-year $)
Funding Profile: FY10 $5M, FY11 $11M, FY12 $22M, FY13 $12M
Space Added: None **Space Removed:** None **Space Rehabilitated:** 60,000 SF
Scope: This project will revitalize and modernize laboratories located in each of 7 buildings: 463 Biology, 490 Medical, 510 Physics; 535 Instrumentation; 555 Chemistry, 703 Multi-program Lab/Office, and 911 Collider-Accelerator. Renovated space totals 55,000 square feet. The scope of refurbishment will include HVAC, fume hoods, electrical, lighting, plumbing, and interior finishes. Collaborative research teams from multiple science programs will use the renovated laboratories. Modern modular laboratory equipment will be used, wherever possible, to provide maximum lab flexibility increasing the potential for reuse. Lab furniture and casework has deteriorated to the point of no longer being functional. The floors, walls and ceilings are severely worn, and in some cases will require lead and asbestos abatement. Plumbing systems are failing and in some instances harbor legacy contamination that presents an environmental liability. Many of the roofs and windows leak and laboratories do not conform to current safety standards.

Project: Interdisciplinary Science Building Ph II
TEC: $69.7M (at-year $)
Funding Profile: FY12 $11M, FY13 $23M, FY14 $32M, FY15 $3.7M
Space Added: 97,000 SF **Space Removed:** 100,259 SF
Scope: This project will provide for the construction of a sustainable 97,000 SF building. Design emphasis will be to foster and stimulate collaborative research. Efficient, high accuracy environmentally controlled HVAC systems will be installed to support cutting edge experimentation and the operation of sensitive instrumentation. Tenants will come from existing permanent science buildings and from older wood and masonry building which will be demolished.

Project: Support Shops I
TEC: $42.8M (at-year $)
Funding Profile: FY14 $12M, FY15 $24.5M, FY16 $6.3M
Space Added: 85,000 SF **Space Removed:** 100,976 SF
Scope: This project will begin the consolidation process by constructing 95,000 sf of office, shops, and support facilities to consolidate several support shops scattered across the site. The new facility will replace 7 buildings grounded into 3 major separated locations across the site. As this project consolidates functions, 100,000sf will be demolished.

Project: Utilities Improvement I
TEC: $38M (at-year $)
Funding Profile: FY15 $4M, FY16 $21.5M, FY17 $12.5M
Space Added: None **Space Removed:** None
Scope: Project will provide multiple utility improvements. BNL's main substation will upgraded to replace 60 year old medium voltage (13.8 kV) switchgear with modern arc-flash resistant and remote racking gear in substation B-603 to protect personnel from potential hazards. Fifty year-old 69kV oil circuit breakers will be replaced with modern SF6 breakers to improve reliability and safety. Degraded sections of 60 year-old steam mains will be replaced as will corroded sections of 50 year-old potable water mains. Approximately 3,000 LF of distribution piping, consistent of steam and condensate lines, will be replaced on Cornell Avenue and manholes will be reconstructed. An additional 5000 LF of low pressure water zones in the housing area will be replaced to ensure adequate fire fighting capability. New fiber-optic cables in duct-banks will replace aging fire alarm and energy management control networks currently operating over low-speed telephone data lines.

Project: Central Computer Building
TEC: $27M (at-year $)
Funding Profile: FY17 $6.5M, FY18 $20.5M
Space Added: 27,000 SF **Space Removed:** 24,405 SF (Balance - BNL space bank)
Scope: This project will construct a 27,000 SF computing facility expansion to Building 515, the Brookhaven Computing Facility (BCF). The expansion will contain both computer space and office space to allow for the consolidation of IT and Business Systems staff. An additional 5MW of power and cooling will be provided. The electrical system, with back-up power, will accommodate the demanding needs of modern high-density computing. Project will require the demolition of 24,400 SF of space (B-459 & 129).

Project: Renovate Science Laboratories III
TEC: $55M (at-year $)
Funding Profile: FY18 $8M, FY15 $13M, FY20 $20M, FY21 $14M
Space Added: None **Space Removed:** None **Space Rehabilitated:** 60,000 SF
Scope: This project will revitalize and modernize laboratories located in each of 7 buildings: 463 Biology, 490 Medical, 510 Physics; 535 Instrumentation; 555 Chemistry, 703 Multi-program Lab/Office, and 911 Collider-Accelerator. Renovated space totals 55,000 square feet. The scope of refurbishment will include HVAC, fume hoods, electrical, lighting, plumbing, and interior finishes. Collaborative research teams from multiple science programs will use the renovated laboratories. Modern modular laboratory equipment will be used, wherever possible, to provide maximum lab flexibility increasing the potential for reuse. Lab furniture and casework has deteriorated to the point of no longer being functional. The floors, walls and ceilings are severely worn, and in some cases will require lead and asbestos abatement. Plumbing systems are failing and in some instances harbor legacy contamination that presents an environmental liability. Many of the roofs and windows leak and laboratories do not conform to current safety standards.

E5.3 Proposed Programmatic Projects (Conventional Construction Aspects Only)

Project: National Synchrotron Light Source II (NSLS-II)
TEC: $220M (at-year $) Conventional Construction
Funding Profile: FY07 $2M, FY08 $11M, FY09 $24M, FY10 $65M, FY11 $74M, FY12 $37M, FY13 $5M, FY14 $2M
Space Added: 425,000 SF **Space Removed:** None (Offset space from space transfer waiver)
Scope: The NSLS II Conventional Facilities will support the scientific mission of the NSLS II project by providing facilities that support world leading accelerator performance in a user facility that optimizes opportunities for collaborative research in photon sciences. The focal point of the facility will be the main NSLS II Ring Building housing the accelerator, experimental floor and associated injection and support buildings. Integrated in the ring building will be an operations center that serves as the main entry to the building and houses the control room and control computing space. There will initially be three Laboratory/Office buildings surrounding the Ring Building to provide office and laboratory space for beamline staff and user research teams, with space available for two future Laboratory/Office buildings. The facilities will also include the needed utility services needed for NSLS II operation which include expansion of and connection to the Central Chilled Water System, expansion and connection to the Electrical Substation and distribution system, connection to steam, sanitary, potable water, storm and communication/data systems.

Project: RHIC II
TEC: $7M (at-year $) Conventional Construction
Funding Profile: FY09 $2M, FY10 $5M
Space Added: 9,300 SF **Space Removed:** (Offset space from BNL space bank)
Scope: This project will construct a 9,300 SF building that will house the Electron Recirculation Linac (ERL) and the support equipment necessary for its operation. The ERL provides high energy electrons for cooling heavy ions in RHIC II. The support equipment in and around this building will include the RF drivers, helium and water cooling systems, power supplies, utility systems, instrumentation and a control room for the ERL and electron transport into the RHIC machine.

APPENDIX 6
EXCESS ASSETS

ID	NAME	GROSS SF	EXCESS YEAR	CONTAM	DEMO $k Est.	DEMO FY	FUNDING	NOTES
SC BUILDINGS								
0096	Truck/Utility Storage	5,591	2007	N	200	2007	BNL	BNL demo in 2007
0491	Medical Research Reactor	11,653	2007	Y	18,500	TBD	None	Possible transfer to EM
0492	Well No. 105	1,243	2007	N	80	TBD	None	May include as part of space offset for Line Item
0629	Emergency Power Facility	1,281	2007	N	95	TBD	None	May include as part of space offset for Line Item
0650	Custodial Storage	12,408	2007	Y	8,000	TBD	None	Possible transfer to EM
0952	Storage	224	2007	N	8	2007	EFD	May include in FY07 EFD project
0650A	Storage	1,246	2007	Y	200	2007	EFD	Demo'd June 2007
EM BUILDINGS								
0704	Fan House	9,864	2007	Y	5,000	2012	EM	