

## Compliance Status

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*Brookhaven National Laboratory is subject to more than 100 sets of federal, state, and local environmental regulations; numerous site-specific permits; 15 equivalency permits for operation of 12 groundwater remediation systems; and several other binding agreements. In 2006, the Laboratory operated in compliance with most of the requirements defined in these governing documents. Instances of noncompliance were reported to regulatory agencies and corrected expeditiously. Routine inspections conducted during the year found no significant instances of noncompliance; however, minor deficiencies were noted during inspections conducted by the New York State Department of Environmental Conservation (NYSDEC).*

*Emissions of nitrogen oxides, carbon monoxide, opacity, and sulfur dioxide from the Central Steam facility were all within permit limits. Continued efforts to eliminate opacity excursions in 2006 were successful, and there were no excursions reported for the year. Approximately 2,024 pounds of ozone-depleting refrigerants were recovered for recycling on site or made available for use by other DOE facilities or other federal agencies. These reductions included removal of one hundred sixteen 17-pound and four 13-pound Halon 1211 extinguishers. Monitoring BNL's potable water system showed that all drinking water requirements were met. During 2006, most of the liquid effluents discharged to surface water and groundwater met applicable New York State Pollutant Discharge Elimination System permit requirements. Four minor excursions of these permit limits were reported for the year; three at the Sewage Treatment Plant and one at a recharge basin. The permit excursions were reported to NYSDEC and the Suffolk County Department of Health Services. Groundwater monitoring at the Major Petroleum Facility continued to demonstrate that current oil storage and transfer operations are not affecting groundwater quality.*

*Laboratory efforts to minimize spills of materials continued in 2006. There were seven reportable spills of petroleum products, antifreeze, or chemicals; 50 percent less than in 2005. All releases were two gallons or less. There were four spills of glycol, the most common material spilled, typically due to failed vehicle cooling systems; two spills of hydraulic fluid; and a single spill of diesel fuel. All releases were cleaned up to the satisfaction of NYSDEC.*

*The Laboratory participated in 10 environmental audits by external regulatory agencies in 2006. These audits included inspections of petroleum and chemical storage, hazardous waste operations, Sewage Treatment Plant operations, other regulated outfalls and recharge basins, and the potable water system. Immediate corrective actions were taken to address all issues raised during these inspections. There were two Notices of Violation issued in 2006 for excess opacity measurements conducted in 2005. These excursions were self-reported and corrective actions were completed in 2005.*

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**3.1 COMPLIANCE WITH REQUIREMENTS**

The federal, state, and local environmental statutes and regulations that BNL operates under are summarized in Table 3-1, along with a discussion of the Laboratory’s compliance status with each. A list of all applicable environmental regulations is found in Appendix D.

**3.2 ENVIRONMENTAL PERMITS**

**3.2.1 Existing Permits**

Many processes and facilities at BNL operate under permits issued by environmental regula-

tory agencies. Table 3-2 provides a complete list of the existing permits, some of which are briefly described below.

- State Pollutant Discharge Elimination System (SPDES) permit, issued by New York State Department of Environmental Conservation (NYSDEC)
- Major Petroleum Facility (MPF) license, issued by NYSDEC
- Resource Conservation and Recovery Act (RCRA) permit issued by NYSDEC for the Waste Management Facility

**Table 3-1. Federal, State, and Local Environmental Statutes and Regulations Applicable to BNL.**

Regulator: Codified Regulation	Regulatory Program Description	Compliance Status	Report Sections
EPA: 40 CFR 300 40 CFR 302 40 CFR 355 40 CFR 370	<b>The Comprehensive Environmental Response, Compensation &amp; Liability Act (CERCLA)</b> provides the regulatory framework for remediation of releases of hazardous substances and remediation (including decontamination and decommissioning, D&D) of inactive hazardous waste disposal sites. Regulators include EPA, DOE, and the New York State Department of Environmental Conservation (NYSDEC).	In 1989, BNL entered into a tri-party agreement with EPA, NYSDEC, and DOE. BNL site remediation is conducted by the Environmental Restoration Program in accordance with milestones established under this agreement. In 2005, BNL completed the restoration portion of the cleanup project and entered the surveillance and maintenance mode. Reactor D&D will continue under the CERCLA program in 2007.	2.3.4.8
Council for Env. Quality: 40 CFR 1500–1508 DOE: 10 CFR 1021	<b>The National Environmental Policy Act (NEPA)</b> requires federal agencies to follow a prescribed process to anticipate the impacts on the environment of proposed major federal actions and alternatives. DOE codified its implementation of NEPA in 10 CFR 1021.	BNL is in full compliance with NEPA requirements. The Laboratory has established sitewide procedures for implementing the NEPA requirements.	3.3
Advisory Council on Historic Preservation: 36 CFR 60 36 CFR 63 36 CFR 79 36 CFR 800 16 USC 470	<b>The National Historic Preservation Act (NHPA)</b> identifies, evaluates, and protects historic properties eligible for listing in the National Register of Historic Places, commonly known as the National Register. Such properties can be archeological sites or historic structures, documents, records, or objects. NHPA is administered by state historic preservation offices (SHPOs; in New York State, NYSHPO). At BNL, structures that may be subject to NHPA include the High Flux Beam Reactor (HFBR), the Brookhaven Graphite Research Reactor (BGRR) complex, World War I training trenches near the Relativistic Heavy Ion Collider project, and the former Cosmotron Building.	The HFBR, BGRR complex, and World War I trenches are eligible for inclusion in the National Register. The former Cosmotron building was identified as potentially eligible in an April 1991 letter from NYSHPO. Any proposed activities involving these facilities must be identified through the NEPA process and evaluated to determine if the action would affect the features that make the facility eligible. Some actions required for D&D of the BGRR were determined to affect its eligibility, and mitigative actions are proceeding according to a Memorandum of Agreement between DOE and NYSHPO. BNL has a Cultural Resource Management Plan to ensure compliance with cultural resource regulations.	3.4
EPA: 40 CFR 50-0 40 CFR 82 NYSDEC: 6 NYCRR 200–257 6 NYCRR 307	<b>The Clean Air Act (CAA)</b> and the NY State Environmental Conservation Laws regulate the release of air pollutants through permits and air quality limits. Emissions of radionuclides are regulated by EPA, via the National Emission Standards for Hazardous Air Pollutants (NESHAPs) authorizations.	All air emission sources are incorporated into the BNL Title V permit or have been exempted under the New York State air program, which is codified under the New York Codes, Rules, and Regulations (NYCRR).	3.5
EPA: 40 CFR 109–140 40 CFR 230, 231 40 CFR 401, 403 NYSDEC: 6 NYCRR 700–703 6 NYCRR 750	<b>The Clean Water Act (CWA)</b> and NY State Environmental Conservation Laws seek to improve surface water quality by establishing standards and a system of permits. Wastewater discharges are regulated by NYSDEC permits through the State Pollutant Discharge Elimination System (SPDES).	BNL permitted discharges include treated sanitary waste, and cooling tower and stormwater discharges. With the exception of four excursions, these discharges met the SPDES permit limits in 2006.	3.6

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Table 3-1. Federal, State, and Local Environmental Statutes and Regulations Applicable to BNL (continued).

Regulator: Codified Regulation	Regulatory Program Description	Compliance Status	Report Sections
EPA: 40 CFR 141–149 NYSDOH: 10 NYCRR 5	The <b>Safe Drinking Water Act (SDWA)</b> and New York State Department of Health (NYSDOH) standards for public water supplies establish minimum drinking water standards and monitoring requirements. SDWA requirements are enforced by the Suffolk County Department of Health Services (SCDHS).	BNL maintains a sitewide public water supply. This water supply met all primary drinking water standards as well as operational and maintenance requirements.	3.7
EPA: 40 CFR 112 40 CFR 300 40 CFR 302 40 CFR 355 40 CFR 370 40 CFR 372	The <b>Oil Pollution Act, the Emergency Planning and Community Right-to-Know Act (EPCRA)</b> , and the Superfund Amendment Reauthorization Act (SARA) require facilities with large quantities of petroleum products or chemicals to prepare emergency plans and report their inventories to EPA, the state, and local emergency planning groups.	Since some facilities at BNL store or use chemicals or petroleum in quantities exceeding threshold planning quantities, BNL is subject to these requirements. BNL fully complies with all reporting and emergency planning requirements.	3.8.1 3.8.2 3.8.3
EPA: 40 CFR 280 NYSDEC: 6 NYCRR 595–597 6 NYCRR 611–613 SCDHS: SCSC Article 12	Federal, state, and local regulations govern the storage of chemicals and petroleum products to prevent releases of these materials to the environment. <b>Suffolk County Safety Codes (SCSC)</b> are more stringent than the federal and state regulations.	The regulations require that these materials be managed in facilities equipped with secondary containment, overflow protection, and leak detection. BNL complies with all federal and state requirements and has achieved conformance to county codes.	3.8.4 3.8.5 3.8.6
EPA: 40 CFR 260–280 NYSDEC: 6 NYCRR 360–372	The <b>Resource Conservation Recovery Act (RCRA)</b> and <b>New York State Solid Waste Disposal Act</b> govern the generation, storage, handling, and disposal of hazardous wastes.	BNL is defined as a large-quantity generator of hazardous waste and has a permitted waste management facility. A hazardous waste regulatory inspection showed that all operations met regulatory requirements in 2006.	3.9
EPA: 40 CFR 700–763	The <b>Toxic Substances Control Act (TSCA)</b> regulates the manufacture, use, and distribution of all chemicals.	BNL manages all TSCA-regulated materials, including PCBs, in compliance with all requirements.	3.10
EPA: 40 CFR 162–171(f) NYSDEC: 6 NYCRR 320 6 NYCRR 325–329	The <b>Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA)</b> and corresponding NY State regulations govern the manufacture, use, storage, and disposal of pesticides and herbicides, as well as the pesticide containers and residuals.	BNL employs NY State-certified pesticide applicators to apply pesticides and herbicides. Each applicator attends training as needed to maintain current certification, and files an annual report to the state detailing the types and quantity of pesticides applied.	3.11
DOE: 10 CFR 1022 NYSDEC: 6 NYCRR 663 6 NYCRR 666	DOE regulations require its facilities to comply with floodplain/wetland review requirements. The <b>New York State Fresh Water Wetlands and Wild, Scenic, and Recreational Rivers</b> rules govern development in the state's natural waterways. Development or projects within a half-mile of regulated waters must have NYSDEC permits.	BNL is in the Peconic River watershed and has several jurisdictional wetlands; consequently, development of locations in the north and east of the site requires NYSDEC permits and review for compliance under DOE wetland/floodplain regulations. In 2006, three projects were permitted under the NYS Fresh Water Program.	3.12
U.S. Fish & Wildlife Service: 50 CFR 17 NYSDEC: 6 NYCRR 182	The <b>Endangered Species Act</b> and corresponding New York State regulations prohibit activities that would jeopardize the continued existence of an endangered or threatened species, or cause adverse modification to a critical habitat.	BNL is host to numerous species of flora and fauna, many categorized by NYS as endangered, threatened, or of special concern. BNL's Natural Resource Management Plan outlines activities to protect these vulnerable species and protect their habitats (see Chapter 6).	3.13
DOE: Manual 231.1-1A	The <b>Environment, Safety, and Health Reporting</b> program objective is to ensure timely collection, reporting, analysis, and dissemination of information on environment, safety, and health issues as required by law or regulations or as needed to ensure that DOE is kept fully informed on a timely basis about events that could adversely affect the health and safety of the public, workers, environment, intended purpose of DOE facilities, or credibility of the Department. Included in the order are the requirements for the Occurrence Reporting and Processing of Operations Program (ORPS).	BNL prepares an annual Site Environmental Report and provides data for DOE to prepare annual NEPA summaries and other Safety, Fire Protection, and Occupational Health and Safety Administration (OSHA) reports. BNL developed the ORPS Subject Area for staff and management who perform specific duties related to discovery, response, notification, investigation, and reporting of occurrences to BNL and DOE management. The ORPS Subject Area is supported by: Occurrence Reporting Program Description, Critiques Subject Area, Occurrence Categorizer's Procedure, and the ORPS Office Procedure.	All chapters

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CHAPTER 3: COMPLIANCE STATUS

Table 3-1. Federal, State, and Local Environmental Statutes and Regulations Applicable to BNL (concluded).

Regulator: Codified Regulation	Regulatory Program Description	Compliance Status	Report Sections
DOE: Order 414.1 10 CFR 830, Subpart A Policy 450.5	The <b>Quality Assurance (QA)</b> program objective is to establish an effective management system using the performance requirements of this Order, coupled with technical standards, where appropriate, to ensure: senior management provides planning, organization, direction, control, and support to achieve DOE objectives; line organizations achieve and maintain quality while minimizing safety and health risks and environmental impacts and maximizing reliability and performance; line organizations have a basic management system in place supporting this Order; and each DOE element reviews, evaluates, and improves its overall performance and that of its contractors using a rigorous assessment process based on an approved QA Program.	BNL has a Quality Management (QM) system to implement quality management methodology throughout its management systems and associated processes to: 1) plan and perform Laboratory operations reliably and effectively to minimize the impact on the safety and health of humans and on the environment; 2) standardize processes and support continuous improvement in all aspects of Laboratory operations; and 3) enable the delivery of products and services that meet customers' requirements and expectations. Having a comprehensive program ensures that all environmental monitoring data meet QA and quality control requirements. Samples are collected and analyzed using standard operating procedures, to ensure representative samples and reliable, defensible data. Quality control in the analytical labs is maintained through daily instrument calibration, efficiency and background checks, and testing for precision and accuracy. Data are verified and validated according to project-specific quality objectives before they are used to support decision making.	Chapter 9
DOE: Order 435.1	The <b>Radioactive Waste Management Program</b> objective is to ensure that all DOE radioactive waste is managed in a manner that protects workers, public health and safety, and the environment. Order 435.1 requires all DOE organizations that generate radioactive waste to implement a waste certification program. DOE Laboratories must develop a Radioactive Waste Management Basis (RWMB) Program Description, which includes exemption and timeframe requirements for staging and storing radioactive wastes, both routine and nonroutine.	The BNL Waste Certification Program Plan (WCPP) in the RWMB Program Description defines the radioactive waste management program's structure, logic, and methodology for waste certification. New or modified operations or activities that do not fall within the scope of the RWMB Program Description must be documented and approved before implementation. BNL's RWMB Program Description describes the BNL policies, procedures, plans, and controls demonstrating that BNL has the management systems, administrative controls, and physical controls to comply with DOE Order 435.1.	2.3.4.3
DOE: Order 450.1 (former Order 5400.1)	The <b>Environmental Protection Program</b> objective is to implement sound stewardship practices that protect the air, water, land, and other natural and cultural resources affected by DOE operations, in a cost-effective manner, meeting or exceeding applicable environmental; public health; and resource protection laws, regulations, and DOE requirements. DOE facilities meet this objective by implementing an Environmental Management System (EMS) that is part of an Integrated Safety Management System (ISMS). Other components include establishing sound environmental monitoring programs to comply with former DOE Order 5400.1. The Site Based Management System (SBMS) provides staff with procedural guidance.	BNL's EMS was officially registered to the ISO 14001:1996 standard in 2001 and recertified to the revised standard in 2004. In June 2006, a surveillance audit was conducted that found the BNL EMS to be robust. The BNL ISMS Program Description presents the Laboratory's approach to integrating environment, safety, and health (ES&H) requirements into the processes for planning and conducting work at BNL. It describes BNL's programs, including the SBMS, for accomplishing work safely and provides the road map of the systems and processes.	Chapter 2
DOE: Order 5400.5, Change 2	To protect members of the public and the environment against undue risk from radiation, the <b>Radiation Protection of the Public and Environment Program</b> establishes standards and requirements for operations of DOE and DOE contractors.	BNL uses the guidance values provided in DOE Order 5400.5 to ensure that effluents and emissions do not affect the environment or public and worker safety and health, and to ensure that all doses meet the "As Low As Reasonably Achievable" (ALARA) policy.	Chapters 4, 5, 6, and 8

Notes:  
CFR = Code of Federal Regulations  
NYCRR = New York Codes, Rules, and Regulations  
SCSC = Suffolk County Sanitary Code

Table 3-2. BNL Environmental Permits.

Issuing Agency	Bldg. or Facility	Process/Permit Description	Permit ID No.	Expiration or Completion	Emission Unit ID	Source ID
EPA - NESHAPs	510	Calorimeter Enclosure	BNL-689-01	None	NA	NA
EPA - NESHAPs	705	Building Ventilation	BNL-288-01	None	NA	NA
EPA - NESHAPs	820	Accelerator Test Facility	BNL-589-01	None	NA	NA
EPA - NESHAPs	AGS	AGS Booster - Accelerator	BNL-188-01	None	NA	NA
EPA - NESHAPs	RHIC	Accelerator	BNL-389-01	None	NA	NA
EPA - SDWA	BNL	Underground Injection Control	NYU500001	11-Feb-11	NA	NA
NYSDEC - Air Equivalency	517	Middle Road System	1-51-009	NA	NA	NA
NYSDEC - Air Equivalency	518	South Boundary System	1-51-009	NA	NA	NA
NYSDEC - Air Equivalency	598	OU I Remediation System	1-52-009	NA	NA	NA
NYSDEC - Air Equivalency	539	Western South Boundary System	1-52-009	NA	NA	NA
NYSDEC - Air Equivalency	TR 867	T-96 Remediation System	NA	NA	NA	NA
NYSDEC - SPDES Equivalency	517	Middle Road System	1-51-009	NA	NA	NA
NYSDEC - SPDES Equivalency	518	South Boundary System	1-51-009	NA	NA	NA
NYSDEC - SPDES Equivalency	539	W. South Boundary System	1-52-009	NA	NA	NA
NYSDEC - SPDES Equivalency	598	OU I Remediation System	1-52-009	31-Oct-06	NA	NA
NYSDEC - SPDES Equivalency	598	Tritium Remediation System	1-52-009	NA	NA	NA
NYSDEC - SPDES Equivalency	670	Sr-90 Treatment System	None	NA	NA	NA
NYSDEC - SPDES Equivalency	TR 829	Carbon Tetrachloride System	None	NA	NA	NA
NYSDEC - SPDES Equivalency	OS-4	Airport/LIPA Treatment System	None	NA	NA	NA
NYSDEC - SPDES Equivalency	OS-2	Industrial Park East Treatment System	None	NA	NA	NA
NYSDEC - SPDES Equivalency	OS-5	North St./North St. East Treatment System	None	NA	NA	NA
NYSDEC - SPDES Equivalency	OS-6	Ethylene Di-Bromide Treatment System	None	1-Aug-09	NA	NA
NYSDEC - SPDES Equivalency	855	Sr-90 Treatment System - BGRR/WCF	None	1-Jan-10	NA	NA
NYSDEC - Hazardous Substance	BNL	Bulk Storage Registration Certificate	1-000263	27-Jul-07	NA	NA
NYSDEC - LI Well Permit	BNL	Domestic Potable/Process Wells	1-4722-00032/00113	13-Sep-08	NA	NA
NYSDEC - Air Quality	197	Lithographic Printing Presses	1-4722-00032/00115	06-Jan-07	U-LITHO	19709-10
NYSDEC - Air Quality	423	Metal Parts Cleaning Tanks	1-4722-00032/00115	06-Jan-07	U-METAL	42308
NYSDEC - Air Quality	423	Gasoline Storage and Fuel Pumps	1-4722-00032/00115	06-Jan-07	U-FUELS	42309-10
NYSDEC - Air Quality	423	Motor Vehicle A/C Servicing	1-4722-00032/00115	06-Jan-07	U-MVACS	MVAC1&2
NYSDEC - Air Quality	244	Paint Spray Booth	1-4722-00032/00115	06-Jan-07	U-45801	244-02
NYSDEC - Air Quality	244	Flammable Liquid Storage Cabinet	1-4722-00032/00115	06-Jan-07	U-45801	244 AE
NYSDEC - Air Quality	479	Metal Parts Cleaning Tank	1-4722-00032/00115	06-Jan-07	U-METAL	47908
NYSDEC - Air Quality	479	Metal Parts Cleaning Tank	1-4722-00032/00115	06-Jan-07	U-METAL	47906**
NYSDEC - Air Quality	490	Milling Machine/Block Cutter	1-4722-00032/00115	06-Jan-07	U-49003	49003**
NYSDEC - Air Quality	490	Lead Alloy Melting	1-4722-00032/00115	06-Jan-07	U-49003	49004**
NYSDEC - Air Quality	498	Aqueous Cleaning Facility	1-4722-00032/00115	06-Jan-07	U-METAL	49801
NYSDEC - Air Quality	535B	Plating Tanks	1-4722-00032/00115	06-Jan-07	U-INSIG	53501
NYSDEC - Air Quality	535B	Etching Machine	1-4722-00032/00115	06-Jan-07	U-INSIG	53502
NYSDEC - Air Quality	535B	Printed Circuit Board Process	1-4722-00032/00115	06-Jan-07	U-INSIG	53503
NYSDEC - Air Quality	610	Combustion Unit	1-4722-00032/00115	06-Jan-07	U-61005	61005

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CHAPTER 3: COMPLIANCE STATUS

Table 3-2. BNL Environmental Permits (concluded).

Issuing Agency	Bldg. or Facility	Process/Permit Description	Permit ID No.	Expiration or Completion	Emission Unit ID	Source ID
NYSDEC - Air Quality	610	Combustion Unit	1-4722-00032/00115	06-Jan-07	U-61006	61006
NYSDEC - Air Quality	610	Combustion Unit	1-4722-00032/00115	06-Jan-07	U-61007	61007
NYSDEC - Air Quality	610	Metal Parts Cleaning Tray	1-4722-00032/00115	06-Jan-07	U-METAL	61008
NYSDEC - Air Quality	610	Combustion Unit	1-4722-00032/00115	06-Jan-07	U-61005	6101A
NYSDEC - Air Quality	630	Gasoline Storage & Fuel Pumps	1-4722-00032/00115	06-Jan-07	U-FUELS	63001-03
NYSDEC - Air Quality	820	Metal Parts Cleaning Tank	1-4722-00032/00115	06-Jan-07	U-METAL	82001**
NYSDEC - Air Quality	902	Epoxy Coating/Curing Exhaust	1-4722-00032/00115	06-Jan-07	U-COILS	90206
NYSDEC - Air Quality	903	Metal Parts Cleaning Tank	1-4722-00032/00115	06-Jan-07	U-METAL	90304
NYSDEC - Air Quality	919B	Electroplating Operation	1-4722-00032/00115	06-Jan-07	U-INSIG	91904
NYSDEC - Air Quality	922	Metal Parts Cleaning Tank	1-4722-00032/00115	06-Jan-07	U-METAL	92202-03**
NYSDEC - Air Quality	922	Electroplating Operation	1-4722-00032/00115	06-Jan-07	U-INSIG	92204
NYSDEC - Air Quality	923	Electronic Equipment Cleaning	1-4722-00032/00115	06-Jan-07	U-METAL	9231A
NYSDEC - Air Quality	923	Parts Drying Oven	1-4722-00032/00115	06-Jan-07	U-METAL	9231B
NYSDEC - Air Quality	924	Magnet Coil Production Press	1-4722-00032/00115	06-Jan-07	U-INSIG	92402
NYSDEC - Air Quality	924	Vapor/Ultrasonic Degreasing Unit	1-4722-00032/00115	06-Jan-07	U-METAL	92404
NYSDEC - Air Quality	Site	Halon 1211 Portable Extinguishers	1-4722-00032/00115	06-Jan-07	U-HALON	H1211
NYSDEC - Air Quality	Site	Halon 1301 Fire Suppression Systems	1-4722-00032/00115	06-Jan-07	U-HALON	H1301
NYSDEC - Air Quality	Site	Packaged A/C Units	1-4722-00032/00115	06-Jan-07	U-RFRIG	PKG01-02
NYSDEC - Air Quality	Site	Reciprocating Chillers	1-4722-00032/00115	06-Jan-07	U-RFRIG	REC01-52
NYSDEC - Air Quality	Site	Rotary Screw Chillers	1-4722-00032/00115	06-Jan-07	U-RFRIG	ROTO1-11
NYSDEC - Air Quality	Site	Split A/C Units	1-4722-00032/00115	06-Jan-07	U-RFRIG	SPL01-02
NYSDEC - Air Quality	Site	Centrifugal Chillers	1-4722-00032/00115	06-Jan-07	U-RFRIG	CEN01-24
NYSDEC - Hazardous Waste	WMF	Waste Management	1-4722-00032/00102	19-Nov-16	NA	NA
NYSDEC - Natural Resources	AGS	Construction of AGS Storage Facility	1-4722-00032/00133	23-Mar-06	NA	NA
NYSDEC - Natural Resources	RHIC	Construction of New Recharge Basin	1-4722-00032/00129	17-May-07	NA	NA
NYSDEC - Natural Resources	RHIC	Construct 9C/7C Alcove Building	1-4722-00032/00137	08-Sep-08	NA	NA
NYSDEC - NESHAPs	REF	Radiation Effects/Neutral Beam	BNL-789-01	None	NA	NA
NYSDEC - NESHAPs	RTF	Radiation Therapy Facility	BNL-489-01	None	NA	NA
NYSDEC - Water Quality	CSF	Major Petroleum Facility	1-1700	31-Mar-07	NA	NA
NYSDEC - Water Quality	STP	Sewage Plant and Recharge Basins	NY-0005835	01-Mar-10	NA	NA

Notes:

AGS = Alternating Gradient Synchrotron  
 CSF = Central Steam Facility  
 EPA = Environmental Protection Agency  
 NESHAPs = National Emission Standards for Hazardous Air Pollutants  
 NYSDCE = New York State Department of Environmental Conservation  
 NA=Not Applicable  
 OU = Operable Unit

RTF = Radiation Therapy Facility  
 RHIC = Relativistic Heavy Ion Collider  
 SDWA = Safe Drinking Water Act  
 SPDES = State Pollutant Discharge Elimination System  
 STP = Sewage Treatment Plant  
 WMF = Waste Management Facility

- Registration certificate from NYSDEC for tanks storing bulk quantities of hazardous substances
- Seven radiological emission authorizations issued by the United States Environmental

- Protection Agency (EPA) under the National Emission Standards for Hazardous Air Pollutants (NESHAPs)
- Air emissions permit issued by NYSDEC under Title V of the Clean Air Act Amend-

ments authorizing the operation of 39 facilities

- Three permits issued by NYSDEC for construction activities within the Peconic River corridor
- An EPA Underground Injection Control (UIC) Area permit for the operation of 90 UIC wells
- Permit for the operation of six domestic water supply wells, issued by NYSDEC
- Fifteen equivalency permits for the operation of 12 groundwater remediation systems installed under the Interagency Agreement (Federal Facility Agreement under the Comprehensive Environmental Response, Compensation and Liability Act [CERCLA])

### 3.2.2 New or Modified Permits

#### 3.2.2.1 Hazardous Waste Management Permit

The RCRA Part B permit authorizes BNL to store, prepare for shipment, and ship hazardous wastes generated by site operations. This permit expired in July 2005, but remained in force while NYSDEC reviewed BNL's renewal application. The permit was re-issued in November 2006 and remains in effect for a period of 10 years.

#### 3.2.2.2 Air Emissions Permits

Air emissions permits are granted by NYSDEC. The Title V permit consolidates all applicable federal and state requirements for BNL's regulated emission sources into a single document. The Laboratory has a variety of nonradioactive air emission sources covered under the permit that are subject to federal or state regulations. Section 3.5 describes the more significant sources and the methods used by BNL to comply with the applicable regulatory requirements. In June 2006, an application to renew the Laboratory's Title V operating permit was submitted to NYSDEC. The application included numerous changes to reflect the removal of certain processes previously included in the permit, as well as the addition of new processes.

Air emissions permits are also issued as "equivalency" permits for the installation and operation of groundwater remediation systems under CERCLA, or as changes to the BNL

Title V operating permit. During 2006, no CERCLA air equivalency permits were issued.

### 3.3 NEPA ASSESSMENTS

The National Environmental Policy Act (NEPA) regulations require federal agencies to evaluate the effects of proposed major federal activities on the environment. The prescribed evaluation process ensures that the proper level of environmental review is performed before an irreversible commitment of resources is made.

An Environmental Assessment (EA) of the proposed construction and operation of the National Synchrotron Light Source II (NSLS-II) was prepared in 2006. NSLS-II will be an advanced synchrotron light source designed to study the properties and functions of materials, primarily in the nanoscale range (1 to 100 nanometers). This new state-of-the-art facility will consist of a medium energy (3 billion electron volt) electron storage ring, estimated at 2,560 feet (780 meters) in circumference, with beamlines 200 feet long (60 meters). NSLS-II will replace the existing NSLS, which has been operational and producing world-class science for more than 24 years. The EA analyzed the potential environmental consequences of the facility and compared them to the consequences of a "No Action" alternative. The assessment included detailed analysis of all potential environmental, safety and health hazards anticipated in the design, construction, and operation of the facility. Based on information and analysis in the EA, DOE determined that the proposed action would not significantly affect the quality of the human environment within the meaning of the National Environmental Policy Act of 1969, and issued a Finding of No Significant Impact (FONSI) in October 2006.

During 2006, environmental evaluations were completed for 81 additional proposed projects. Of these, 75 were considered minor actions requiring no additional documentation. The six remaining projects were addressed by submitting notification forms to DOE, which determined that they were covered by existing Categorical Exclusions as per 10 CFR 1021 or fell within the scope of a previous environmental assessment.

### 3.4 PRESERVATION LEGISLATION

The Laboratory is subject to several cultural resource laws, most notably the National Historic Preservation Act and the Archeological Resource Protection Act. These laws require agencies to consider the effects of proposed federal actions on historic structures, objects, and documents, as well as cultural or natural places important to Native Americans or other ethnic groups.

BNL has three structures or sites that are eligible for listing on the National Register of Historic Places: the Brookhaven Graphite Research Reactor complex, the High Flux Beam Reactor complex, and the World War I Army training trenches associated with Camp Upton. An annual Department of Interior questionnaire regarding historic and cultural resources was submitted in March 2006. Additional activities associated with historic preservation compliance are described in Chapter 6.

### 3.5 CLEAN AIR ACT

The objectives of the Clean Air Act (CAA), which is administered by EPA and NYSDEC, are to improve or maintain regional ambient air quality through operational and engineering controls on stationary or mobile sources of air pollution. Both conventional and hazardous air pollutants are regulated under the CAA.

#### 3.5.1 Conventional Air Pollutants

The Laboratory has a variety of conventional, nonradioactive air emission sources that are subject to federal or state regulations. The following subsections describe the more significant sources and the methods used by BNL to comply with the applicable regulatory requirements.

##### 3.5.1.1 Boiler Emissions

BNL has four boilers (Nos. 1A, 5, 6, and 7) at the Central Steam Facility (CSF) that are subject to NYSDEC Reasonably Available Control Technology requirements. Three of the boilers can burn either residual fuel oil or natural gas; Boiler 1A burns fuel oil only. In 2006, low nitrogen residual fuel oil (i.e., below 0.3 percent) was the predominant fuel burned in all four boilers. For boilers with maximum

operating heat inputs greater than or equal to 50 MMBtu/hr (14.6 MW), the requirements establish emissions standards for oxides of nitrogen (NO<sub>x</sub>). Boilers with a maximum operating heat input between 50 and 250 MMBtu/hr (14.6 and 73.2 MW) can demonstrate compliance using periodic emission tests or by using continuous emission monitoring equipment. Emission tests conducted in 1995 and again in 2006 confirmed that boilers 1A and 5, both in this size category, met the NO<sub>x</sub> emission standards when burning residual fuel oil with low nitrogen content. To ensure continued compliance, an outside contract analytical laboratory analyzes composite samples (collected quarterly) of fuel deliveries. The analyses conducted in 2006 confirmed that the fuel-bound nitrogen content met these requirements. Compliance with the 0.30 lbs/MMBtu NO<sub>x</sub> emission standards for boilers 6 and 7 was demonstrated by continuous emission monitoring of the flue gas. In 2006, NO<sub>x</sub> emissions from Boilers 6 and 7 averaged 0.210 lbs/MMBtu and 0.162 lbs/MMBtu, respectively, and there were no known exceedances of the NO<sub>x</sub> emission standard for either boiler.

The Laboratory also maintains continuous opacity monitors for boilers 6 and 7. These monitors measure the transmittance of light through the exhaust gas and report this measurement in percent attenuated. Opacity limitations state that no facility may emit particulates such that the opacity exceeds 20 percent, calculated in 6-minute averages, except for one period not to exceed 27 percent in any one hour. To maintain boiler efficiency, soot that accumulates on the boiler tubes must be removed. This is accomplished by passing a mixture of high-pressure steam and air through the boiler using a series of blowers. In 2006, BNL reported no periods where opacity exceeded the 6-minute, 20 percent average due to soot blowing operations. The only deviations from the opacity standard occurred during boiler startup and shutdown or during required opacity monitor calibration error testing. Both EPA and NYSDEC recognize these periods as permissible.

##### 3.5.1.2 Ozone-Depleting Substances

*Refrigerants.* The Laboratory's preventative

maintenance program requires regular inspection and maintenance of refrigeration and air conditioning equipment that contains ozone-depleting substances such as R-11, R-12, and R-22. All refrigerant recovery and recycling equipment is certified to meet refrigerant evacuation levels specified by 40 CFR 82.158. As a matter of standard practice at BNL, if a refrigerant leak is found, technicians will either immediately repair the leak or isolate it and prepare a work order for the needed repairs. This practice exceeds the leak repair provisions of 40 CFR 82.156. In 2006, approximately 132 pounds of R-22 were recovered and recycled from refrigeration equipment that was serviced.

*Halon.* Halon 1211 and 1301 are extremely efficient fire suppressants, but are being phased out due to their effect on the Earth's ozone layer. In 1998, the Laboratory purchased equipment to comply with the halon recovery and recycling requirements of the CAA, 40 CFR 82 Subpart H. When portable fire extinguishers or fixed systems are removed from service and when halon cylinders are periodically tested, BNL technicians use halon recovery and recycling devices, to comply with the CAA provisions.

In 2006, BNL declared one hundred sixteen 17-pound and four 13-pound Halon 1211 portable fire extinguishers as excess property. The Laboratory is making arrangements for their transfer to another DOE facility or to another federal agency, in accordance with the Class I Ozone Depleting Substances Disposition Guidelines of the DOE Office of Environmental Policy and Guidance. The portable extinguishers became excess property after they were removed from areas they served, due to changes in operations, or when they were replaced by ABC dry-chemical or clean agent FE-36 extinguishers.

### 3.5.2 Hazardous Air Pollutants

In 1970, the CAA established standards to protect the general public from hazardous air pollutants that may lead to death or an increase in irreversible or incapacitating illnesses. The National Emission Standards for Hazardous Air Pollutants (NESHAPs) program was established

in 1977 and the governing regulations were updated significantly in 1990. EPA developed this program to limit the emission of 189 toxic air pollutants. This program includes a list of regulated contaminants, a schedule for implementing control requirements, aggressive technology-based emission standards, industry-specific requirements, special permitting provisions, and a program to address accidental releases. The following subsections describe BNL's compliance with NESHAPs regulations.

#### 3.5.2.1 *Maximum Available Control Technology*

Based on the Laboratory's review of existing state and federal CAA regulations, no proposed or promulgated Maximum Available Control Technology (MACT) standards apply to BNL operations. In 2006, additional evaluations were performed during the preparation of BNL's Title V operating permit renewal application and during assessments of proposed activities and operations. The evaluations verified that no MACT standards apply to the emissions from existing permitted operations or the anticipated emissions from proposed activities and operations.

#### 3.5.2.2 *Asbestos*

In 2006, the Laboratory notified the EPA Region II office regarding removal of materials containing asbestos. During the year, 1,100 linear feet and 1,450 ft<sup>2</sup> of asbestos-containing pipe and duct insulation, and 9,900 ft<sup>2</sup> of asbestos-containing surface material (siding, roofing, and vinyl asbestos floor tile) were removed and disposed of in accordance with EPA requirements.

#### 3.5.2.3 *Radioactive Airborne Emissions*

Emissions of radiological contaminants are evaluated and, if necessary, monitored to ensure that they do not impact the environment or people working or residing at or near the Laboratory. A full description of this monitoring conducted in 2006 is provided in Chapter 4. BNL transmitted all data pertaining to radioactive air emissions and dose calculations to EPA in fulfillment of the June 30 annual reporting requirement. As in past years, the maximum off-

site dose due to airborne radioactive emissions from the Laboratory continued to be far below the 10 mrem (100  $\mu$ Sv) annual dose limit specified in 40 CFR 61 Subpart H. See Chapters 4 and 8 for more information on the estimated air dose. Using EPA's modeling software, the dose to the hypothetical maximally exposed individual resulting from BNL's airborne emissions was 0.08 mrem (0.8  $\mu$ Sv).

### 3.6 CLEAN WATER ACT

The disposal of wastewater generated by Laboratory operations is regulated under the Clean Water Act (CWA) as implemented by NYSDEC and under DOE Order 5400.5, Radiation Protection of the Public and the Environment. The goals of the CWA are to achieve a level of water quality that promotes the propagation of fish, shellfish, and wildlife; to provide waters suitable for recreational purposes; and to eliminate the discharge of pollutants into surface waters. New York State was delegated CWA authority in 1975. NYSDEC has issued a SPDES permit to regulate wastewater effluents at the Laboratory. This permit was renewed in May 2005, and specifies monitoring requirements and effluent limits for nine of 12 outfalls, as described below. See Figure 5-7 in Chapter 5 for the locations of BNL outfalls.

- Outfall 001 is used for the discharge of the treated effluent from the STP to the Peconic River.
- Outfalls 002, 002B, 003, 005, 006A, 006B, 008, 010, 011, and 012 are recharge basins used to discharge cooling tower blowdown, once-through cooling water, and/or stormwater. NYSDEC does not require BNL to monitor Outfalls 003, 011, and 012.
- Outfall 007 receives backwash water from the potable Water Treatment Plant filter building.
- Outfall 009 consists of numerous subsurface and surface wastewater disposal systems (e.g., drywells) that receive predominantly sanitary waste and steam- and air-compressor condensate discharges. NYSDEC does not require monitoring of this outfall.

Each month, the Laboratory prepares Dis-

charge Monitoring Reports that describe monitoring results, evaluate compliance with permit limitations, and identify corrective measures taken to address permit excursions. These reports are submitted to the NYSDEC central and regional offices and the Suffolk County Department of Health Services (SCDHS). Details of the monitoring program conducted for the groundwater treatment systems and SPDES equivalency permit performance are provided in SER Volume II, Groundwater Status Report.

#### 3.6.1 Sewage Treatment Plant

Sanitary and process wastewater generated by BNL operations is conveyed to the Sewage Treatment Plant (STP) for processing before discharge to the Peconic River. The STP provides tertiary treatment of this wastewater (settling/sedimentation, biological reduction of organic matter, and reduction of nitrogen). Chapter 5 provides a detailed description of the treatment process.

A summary of the SPDES monitoring results for the STP discharge at Outfall 001 is provided in Table 3-3. The relevant SPDES permit limits are also shown. The Laboratory monitors the STP discharge for more than 100 parameters monthly and more than 200 parameters quarterly. BNL's overall compliance with effluent limits was greater than 99 percent. In 2006, there were three excursions of the SPDES permit limits: two for total nitrogen and one for iron. Each of these excursions was investigated.

In August and September, effluent concentrations for total nitrogen were just above the Laboratory's SPDES limit of 10 ppm with discharges of 10.8 and 10.5, respectively. The slight increase in nitrogen levels was attributed to ineffective denitrification of the effluent by the biological organisms during treatment due to limited nutrients in the waste. To increase the nutrient load to the secondary treatment process, the primary clarifier was bypassed and the raw influent was directed into the modular aeration system. Based on data for October through December, the change in operation appeared to resolve the problem. In September, iron was detected in a single sample. Sporadic iron excursions are typically associated with increased

Table 3-3. Analytical Results for Wastewater Discharges to Sewage Treatment Plant Outfall 001.

Analyte	Low Report	High Report	Min. Monitoring. Freq.	SPDES Limit	Exceedances	% Compliance*
Max. temperature (°F)	52	81	Daily	90	0	100
pH (SU)	6.0	7.4	Continuous Recorder	Min. 5.8	0	100
Avg. 5-day BOD (mg/L)	< 1	< 1	Twice Monthly	10	0	100
Max. 5-day BOD (mg/L)	< 2	< 2	Twice Monthly	20	0	100
% BOD removal	> 93	> 99	Monthly	85	0	100
Avg. TSS (mg/L)	< 0.3	< 1.0	Twice Monthly	10	0	100
Max. TSS (mg/L)	< 0.6	< 2.9	Twice Monthly	20	0	100
% TSS removal	> 96	> 99	Monthly	85	0	100
Settleable solids (ml/L)	0.0	0.0	Daily	0.1	0	100
Ammonia nitrogen (mg/L)	< 0.10	2.2 (a)	Twice Monthly	2	0	100
Total nitrogen (mg/L)	2.6	10.8 (b)	Twice Monthly	10	2	93
Total phosphorus (mg/L)	0.8	1.6	Twice Monthly	NA	0	100
Cyanide (µg/L)	< 1.5	3.1	Twice Monthly	100	0	100
Copper (mg/L)	0.02	0.09	Twice Monthly	0.15	0	100
Iron (mg/L)	0.11	0.45 (c)	Twice Monthly	0.37	1	96
Lead (mg/L)	< 0.001	0.003	Twice Monthly	0.019	0	100
Nickel (mg/L)	0.007	0.024	Twice Monthly	0.11	0	100
Silver (mg/L)	< 0.001	0.003	Twice Monthly	0.015	0	100
Zinc (mg/L)	0.021	0.09	Twice Monthly	0.1	1	100
Mercury (mg/L)	< 0.00005	0.0002	Twice Monthly	0.0008	0	100
Toluene (µg/L)	< 1.0	< 1.0	Twice Monthly	5	0	100
Methylene chloride (µg/L)	< 2.00	< 2.0	Twice Monthly	5	1	100
1,1,1-trichloroethane (µg/L)	< 1.0	< 1.0	Twice Monthly	5	0	100
2-butanone (µg/L)	< 5.0	< 5.0	Twice Monthly	50	0	100
PCBs (µg/L)	< 0.0565	< 0.056	Quarterly	NA	0	100
Max. flow (MGD)	0.24	0.56	Continuous Recorder	2.3	0	100
Avg. flow (MGD)	0.20	0.41	Continuous Recorder	NA	0	100
Avg. fecal coliform (MPN/100 mL)	< 1	10.7	Twice Monthly	200	0	100
Max. fecal coliform (MPN/100 mL)	< 2	<30	Twice Monthly	400	0	100

## Notes:

See Chapter 5, Figure 5-6 for location of Outfall 001.

\* % Compliance = total no. samples – total no. exceedances/total no. samples x 100

BOD = Biological Oxygen Demand

MGD = Million Gallons per Day

MPN = Most Probable Number

NA = Not Applicable

SU = Standard Unit

TSS = Total Suspended Solids

(a) Although one sample had an ammonia concentration of 2.2 mg/L, a violation was not reported, due to mathematical rounding.

(b) Two permit exceedances of the total nitrogen limits were reported, one in August and one in September.

(c) A single sample collected in September exhibited an iron concentration of 0.45 ppm, which exceeded the permit limit of 0.37 ppm.

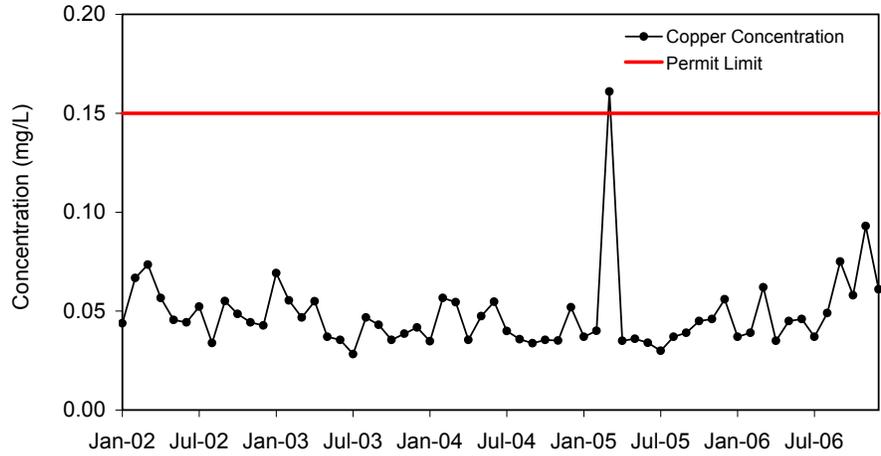
Please refer to Section 3.6.1 for explanations of these permit exceedances.

sediment in the discharge caused by surface runoff during rain events. Figures 3-1 through 3-7 plot 5-year trends for the monthly concentrations of copper, iron, lead, mercury, nickel, silver, and zinc in the STP discharge.

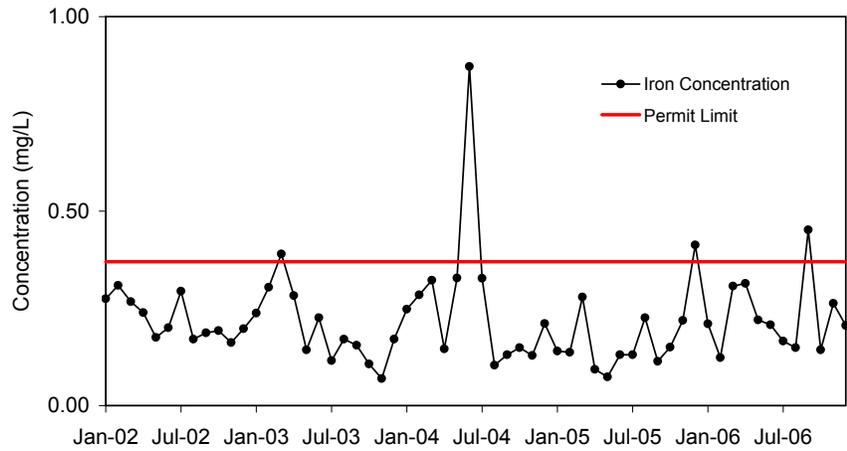
### 3.6.1.1 Chronic Toxicity Testing

The Laboratory's SPDES permit requires that "whole effluent toxicity" (WET) tests be conducted to ensure that chemicals present in the STP effluent are not toxic to aquatic organisms.

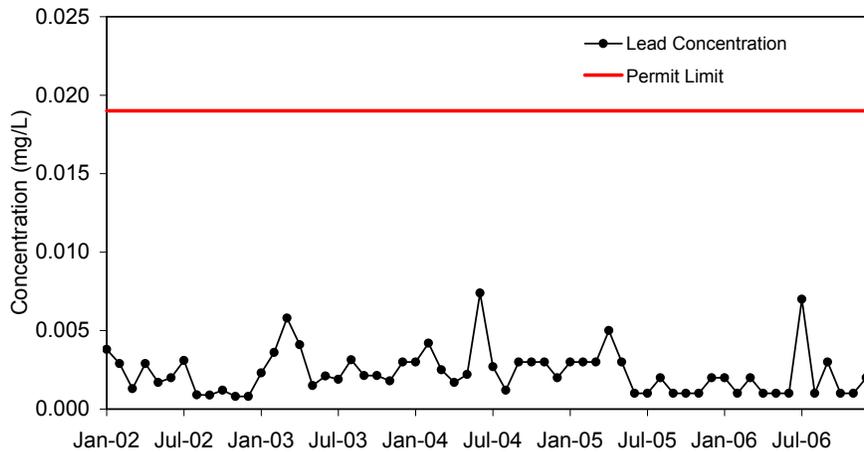
**Figure 3-1. Maximum Concentrations of Copper Discharged from the BNL Sewage Treatment Plant, 2002–2006.**



**Figure 3-2. Maximum Concentrations of Iron Discharged from the BNL Sewage Treatment Plant, 2002–2006.**



**Figure 3-3. Maximum Concentrations of Lead Discharged from the BNL Sewage Treatment Plant, 2002–2006.**



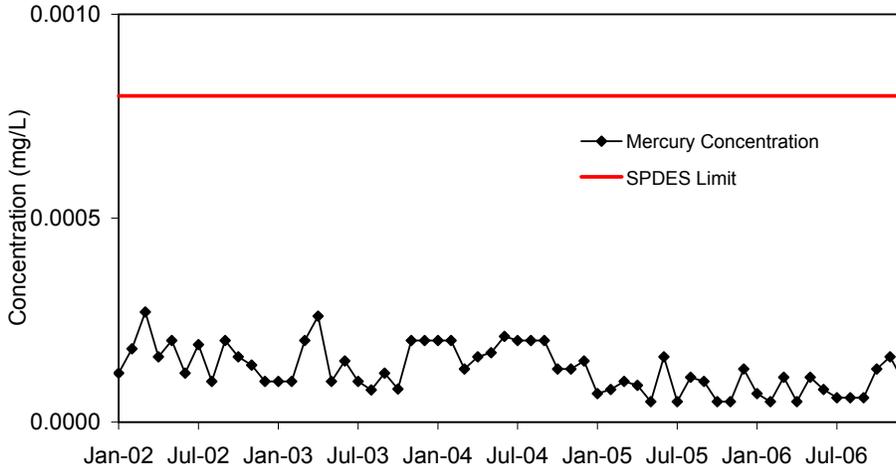


Figure 3-4. Maximum Concentrations of Mercury Discharged from the BNL Sewage Treatment Plant, 2002–2006.

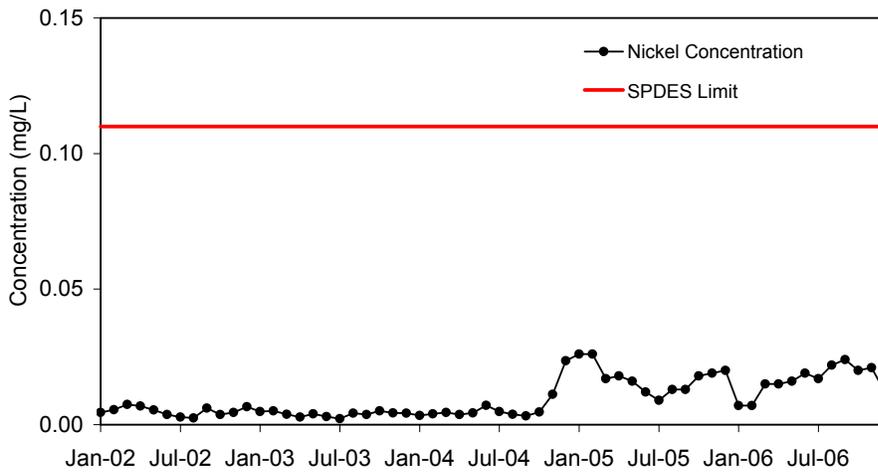


Figure 3-5. Maximum Concentrations of Nickel Discharged from the BNL Sewage Treatment Plant, 2002–2006.

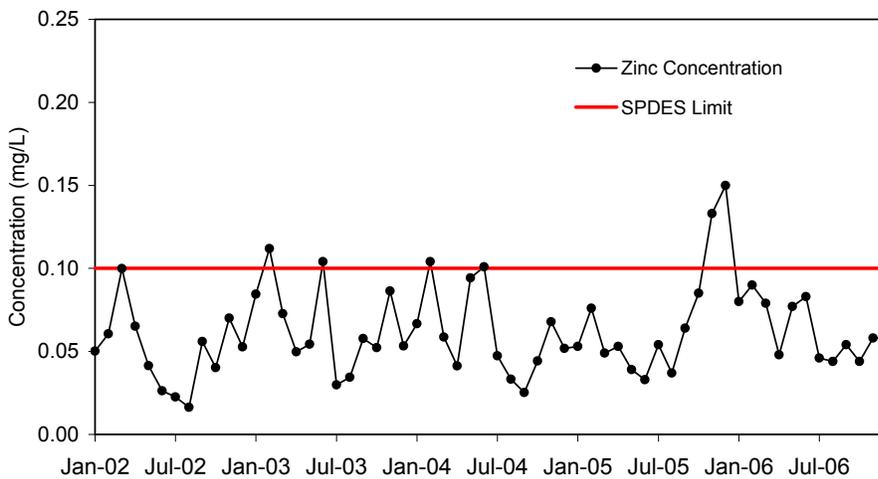
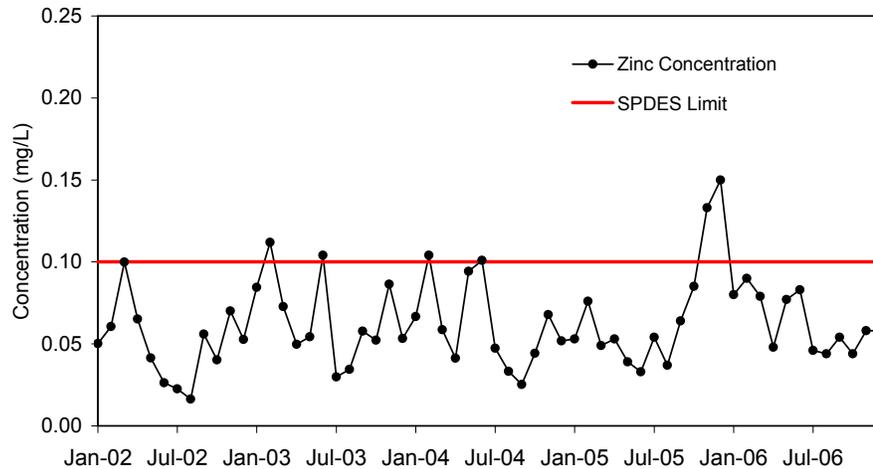


Figure 3-6. Maximum Concentrations of Silver Discharged from the BNL Sewage Treatment Plant, 2002–2006.

## Note:

Per New York State Department of Environmental Conservation guidance, the concentration of zinc exhibited in the effluent during February and June of 2003 and 2004 and November 2005 was not considered in violation of the State Pollutant Discharge Elimination System effluent limit of 0.1 mg/L, due to rounding off of significant figures.

**Figure 3-7. Maximum Concentrations of Zinc Discharged from the BNL Sewage Treatment Plant, 2002–2006.**



BNL's chronic toxicity testing program began in 1993 and continued through 2003. Toxicity testing was postponed in 2004, but was restarted in March 2005 as stipulated in the 2005 SPDES permit renewal. Under the WET testing provisions, samples are collected and tested quarterly. The program consists of 7-day chronic toxicity testing on two freshwater organisms, water fleas and fathead minnows. In each test, sets of 10 of these organisms are exposed to varying concentrations of the STP effluent (100, 50, 25, 12.5, and 6.25 percent) for 7 days. During testing, the growth rate of the fish and rate of reproduction for the water flea are measured and compared to untreated organisms (i.e., controls). The test results are submitted to NYSDEC for review.

Since tests conducted in 2005 were inconclusive to determine the toxic effects on freshwater organisms, testing was continued in 2006. To evaluate the role of additional calcium in the potable water system, testing continued in 2006 using potable water from the Water Treatment Plant as a dilution water and control source. Tests were performed in March, June, September, and December. Minnows exhibited no acute or chronic toxicity in all tests conducted in 2006. For the water flea, minor impacts on reproduction rates were observed in one of the four tests conducted (June). Because the observed impacts were minor (only evident in one of the four test concentrations tested), no further toxicity reduction was required. Testing will continue in 2007.

### 3.6.2 Recharge Basins and Stormwater

Water discharged to Outfalls 002 through 008 and Outfalls 010 through 012 recharges to groundwater, replenishing the underlying aquifer. Monitoring requirements for each of these discharges vary, depending on the type of wastewater received and the type of cooling water treatment reagents used. Table 3-4 summarizes the monitoring requirements and performance results for 2006. Due to quality control problems at the contract analytical laboratory, sample results were not available for January 2006, resulting in a deviation for Outfall 002B (non-report of data). During the analysis, a quality control sample failed to meet expected performance criteria; consequently all results for samples analyzed as part of this batch were rejected. To mitigate future problems of this nature, additional sample volume is being collected during sample collection periods.

### 3.7 SAFE DRINKING WATER ACT

The extraction and distribution of drinking water is regulated under the federal Safe Drinking Water Act (SDWA). In New York State, implementation of the SDWA is delegated to the New York State Department of Health (NYSDOH) and administered locally by SCDHS. Because BNL provides potable water to "more than 25 full-time residents," it is subject to the same requirements as a municipal water supplier. Monitoring requirements are prescribed annually by SCDHS, and a Potable

Table 3-4. Analytical Results for Wastewater Discharges to Outfalls 002-008 and 010.

Analyte	Outfall 002	Outfall 002B	Outfall 005	Outfall 006A	Outfall 006B	Outfall 007	Outfall 008	Outfall 010	SPDES Limit	No. of Exceedances	% Compliance*
Flow (MGD)	N	CR	CR	CR	CR	CR	CR	CR	NA	NA	NA
Min.	0.04	0.000	0.11	0.02	0.03	0.12	0.000	0.003	NA	NA	NA
Max.	0.58	0.03	0.38	0.06	0.69	0.24	4.2	0.46	NA	NA	NA
pH (SU)	6.2	6.8	6.2	6.3	6.2	6.7	7.3	6.9	NA	NA	NA
Min.	8.2	8.4	8.2	8.1	8.1	7.8	7.6	7.6	8.5, 9.0 (a)	0	98
Max.	12	4	12	12	12	NR	11	11			
Oil and grease (mg/L)	1	< 0.88	< 0.88	< 0.88	< 0.88	NR	0.9	< 0.88	NA		
Min.	2.8	4	2.4	2.3	6.2	NR	2.7	2.5	15	1	92
Max.	NR	NR	4	NR	NR	NR	NR	4	NA	0	100
Copper (mg/L)	NR	NR	< 0.003	NR	NR	NR	NR	< 0.003	NA		
Min.	NR	NR	0.004	NR	NR	NR	NR	0.003	1.0	0	100
Max.	4	NR	NR	NR	NR	NR	4	4	NA		
Aluminum (mg/L)	< 0.07	NR	NR	NR	NR	NR	< 0.07	< 0.07	NA		
Min.	< 0.07	NR	NR	NR	NR	NR	< 0.07	0.2	2.0	0	100
Max.	NR	NR	NR	NR	NR	NR	NR	4	NA		
Lead (mg/L)	NR	NR	NR	NR	NR	NR	NR	< 0.0005	NA		
Min.	NR	NR	NR	NR	NR	NR	NR	0.001	0.05	0	100
Max.	NR	NR	NR	NR	NR	NR	NR	4	NA		
Vanadium (mg/L)	NR	NR	NR	NR	NR	NR	NR	0.001	NPL	NA	NA
Min.	NR	NR	NR	NR	NR	NR	NR	0.006	NA		
Max.	4	NR	NR	NR	NR	NR	NR	NR	NA		
Chloroform (µg/L)	0.4	NR	NR	NR	NR	NR	NR	NR	NA	NA	NA
Min.	2	NR	NR	NR	NR	NR	NR	NR	7	0	100
Max.	4	NR	NR	NR	NR	NR	NR	NR	NA		
Bromo-dichloromethane (µg/L)	0.3	NR	NR	NR	NR	NR	NR	NR	NA	NA	NA
Min.	1.2	NR	NR	NR	NR	NR	NR	NR	5	0	100
Max.	4	NR	NR	NR	NR	NR	NR	NR	NA		
1,1,1-trichloroethane (µg/L)	< 1.0	NR	NR	NR	NR	NR	< 0.5	NR	NA	NA	NA
Min.	< 1.0	NR	NR	NR	NR	NR	< 1	NR	5	0	100
Max.	NR	NR	NR	NR	NR	NR	NR	NR	NA		
1,1-dichloroethylene (µg/L)	NR	NR	NR	NR	NR	NR	NR	NR	NA	NA	NA
Min.	NR	NR	NR	NR	NR	NR	< 0.5	NR	5	0	100
Max.	NR	NR	NR	NR	NR	NR	< 1	NR	NA		
	NR	NR	NR	NR	NR	NR	NR	NR	5	0	100

(continued on next page)

Table 3-4. Analytical Results for Wastewater Discharges to Outfalls 002-008 and 010. (concluded).

Analyte	Outfall 002	Outfall 002B	Outfall 005	Outfall 006A	Outfall 006B	Outfall 007	Outfall 008	Outfall 010	SPDES Limit	No. of Exceedances	% Compliance*
Hydroxyethylidene-diphosphonic acid (mg/L)	N	4	4	4	4	NR	NR	NR			
	Min.	< 0.05	< 0.05	< 0.05	< 0.05	NR	NR	NR	NA	NA	
	Max.	< 0.05	< 0.05	< 0.05	< 0.05	NR	NR	NR	0.5	0	100
Tolyltriazole (mg/L)	N	4	4	4	4	NR	NR	NR			
	Min.	< 0.005	< 0.005	< 0.005	< 0.005	NR	NR	NR	NA	NA	
	Max.	< 0.005	< 0.005	< 0.005	< 0.005	NR	NR	NR	0.2	0	100

Notes:  
 See Chapter 5, Figure 5-6 for location of outfalls.  
 There are no monitoring requirements for Outfalls 009, 011, and 012.  
 \* % Compliance = total no. samples - total no. exceedances/total no. of samples x 100  
 CR = Continuous Recorder  
 MGD = Million Gallons per Day  
 Max. = Maximum value  
 Min. = Minimum value

N = Number of samples  
 NA = Not Applicable  
 NPL = No permit limit, monitoring only  
 NR = Analysis Not Required  
 SU = Standard Unit  
 (a) pH limit is 8.5 for Outfalls 005, 008, and 010. pH limit is 9.0 for Outfalls 002, 002B, 003, 006A, 006B, and 007.

Water Sampling and Analysis Plan (Chaloupka 2006) is prepared by BNL to comply with these requirements.

**3.7.1 Potable Water**

The Laboratory maintains six water supply wells for on-site distribution of potable water. As required by NYSDOH regulations, BNL monitors the potable wells regularly for bacteria, inorganics, organics, and pesticides. The Laboratory also voluntarily monitors drinking water supplies for radiological contaminants yearly. Tables 3-5 and 3-6 provide the potable water supply monitoring data for 2006. In 2006, only iron exceeded New York State Drinking Water Standards (NYS DWS) in samples collected from two of the wells (wells 6 and 7) before distribution. Groundwater from three of the six wells is treated to reduce naturally occurring iron. Treatment at the Water Treatment Plant effectively reduces these levels to below DWS limits. To ensure that BNL’s water supply continually meets NYS DWS, groundwater is also treated with activated carbon or air stripping to remove volatile organic compounds (VOCs). At the point of consumption, drinking water complied with all DWS during 2006. Chapter 7 provides additional data on environmental surveillance tests performed on potable wells. This additional testing goes beyond the minimum SDWA testing requirements.

**3.7.2 Cross-Connection Control**

The SDWA requires that public water suppliers implement practices to protect the water supply from sanitary hazards. One of the safety requirements is to rigorously prevent cross-connections between the potable water supply and facility piping systems that may contain hazardous substances. Cross-connection control is the installation of control devices (e.g., double-check valves, reduced pressure zone valves, etc.) at the interface between a facility and the domestic water main. Cross-connection control devices are required at all facilities where hazardous materials are used in a manner that could result in their introduction into the domestic water system, especially under low-pressure conditions. In addition, secondary

Table 3-5. Potable Water Wells and Potable Distribution System: Analytical Results (Maximum Concentration, Minimum pH Value).

Compound	Well No. 4	Well No. 6	Well No. 7	Well No. 10	Well No. 11	Well No. 12	Potable Distribution Sample	NYS DWS
<b>Water Quality Indicators</b>								
Total coliform	ND	ND	ND	ND	ND	ND	ND	Negative
Color (units)	NA	5	5	< 5	< 5	< 5	< 5	15
Odor (units)	NA	0	0	0	0	0	0	3
Cyanide (µg/L)	NA	< 10	< 10	< 10	< 10	< 10	< 10	SNS
Conductivity (µmhos/cm)	118	168	189	152	199	221	168	SNS
Chlorides (mg/L)	NA	26.5	23.1	15.4	18	21.6	31.4	250
Sulfates (mg/L)	NA	9.4	10.4	6.2	8.6	10.2	9.7	250
Nitrates (mg/L)	NA	0.2	0.24	0.35	0.27	0.43	0.29	10
Nitrites (mg/L)	NA	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	1.0
Ammonia (mg/L)	NA	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	SNS
pH (Standard Units)	6.0	6.1	6.0	6.4	6.3	6.2	7.2	SNS
MBAS (mg/L)	NA	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	SNS
<b>Metals</b>								
Antimony (µg/L)	NA	< 5.90	< 5.90	< 5.90	< 5.90	< 5.90	< 5.90	6.0
Arsenic (µg/L)	NA	< 3.00	< 3.00	< 3.00	< 3.00	< 3.00	< 3.00	50
Barium (mg/L)	NA	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	2.0
Beryllium (µg/L)	NA	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	4.0
Cadmium (µg/L)	NA	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	5.0
Chromium (mg/L)	NA	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	0.1
Fluoride (mg/L)	NA	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	2.2
Iron (mg/L)	NA	3.77*	2.19*	0.024	< 0.02	< 0.02	0.124	0.3
Lead (µg/L)	NA	< 1.0	< 1.0	< 1.0	< 1.0	1.72	< 1.0	15
Manganese (mg/L)	NA	0.082	0.079	< 0.010	< 0.010	< 0.010	0.127	0.3
Mercury (µg/L)	NA	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	2.0
Nickel (mg/L)	NA	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	SNS
Selenium (µg/L)	NA	< 5.00	< 5.00	< 5.00	< 5.00	< 5.00	< 5.00	50.0
Sodium (mg/L)	NA	14.0	14.6	10.1	12.1	14.1	17.5	SNS
Silver (µg/L)	NA	< 10	< 10	< 10	< 10	< 10	< 10	100
Thallium (µg/L)	NA	< 1.90	< 1.90	< 1.90	< 1.90	< 1.90	< 1.90	2.0
Zinc (mg/L)	NA	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	0.022	5.0
<b>Radioactivity</b>								
Gross alpha activity (pCi/L)	< 1.07	< 1.2	< 1.7	< 0.88	< 1.94	< 1.7	NR	15.0
Gross beta activity (pCi/L)	1.69 ± 0.44	< 2.65	< 2.54	< 0.64	< 3.33	< 2.69	NR	(a)

(continued on next page)

**Table 3-5. Potable Water Wells and Potable Distribution System: Analytical Results (Maximum Concentration, Minimum pH Value) (concluded).**

Compound	Well No. 4	Well No. 6	Well No. 7	Well No. 10	Well No. 11	Well No. 12	Potable Distribution Sample	NYS DWS
Tritium (pCi/L)	< 547	< 653	< 553	< 544	< 549	< 554	NR	20,000
Strontium-90 (pCi/L)	< 0.41	< 0.69	< 0.69	< 0.34	< 0.68	< 0.76	NR	8.0
<b>Other</b>								
Asbestos (M. fibers/L)	NR	NR	NR	NR	NR	NR	< 0.41	7
Calcium (mg/L)	4.3	5.3	5.9	5.9	5.5	8.2	8.6	SNS
Alkalinity (mg/L)	4.8	10.6	13.6	20.1	15.6	20.9	54.4	SNS
Residual chlorine - MRDL (mg/L)	NR	NR	NR	NR	NR	NR	0.6	4.0
TTHM (mg/L)	NR	NR	NR	NR	NR	NR	0.013	0.08**
HAA5 (mg/L)	NR	NR	NR	NR	NR	NR	< 0.002	0.06**

**Notes:**

See Figure 7-3 for well locations.

HAA5 = Five Haloacetic Acids

MBAS = Methylene Blue Active Substances

MRDL = Maximum Residual Disinfectant Level

NA = Not Analyzed due to well shutdown

ND = Not Detected

NR = Analysis Not Required

NYS DWS = New York State Drinking Water Standard

SNS = Drinking Water Standard Not Specified

TTHM = Total Trihalomethanes

\* Water from these wells is treated at the Water Treatment Plant for color and iron reduction prior to site distribution.

\*\* Limit imposed on distribution samples only.

(a) The drinking water standard was changed from 50 pCi/L (concentration based) to 4 mrem/yr (dose based) in late 2003. Because gross beta activity does not identify specific radionuclides, a dose equivalent cannot be calculated. Since there were no specific nuclides detected, compliance with the requirement is demonstrated.

cross-connection controls at the point of use are recommended, to protect users within a specific facility from hazards that might be posed by intra-facility operations.

The Laboratory maintains approximately 200 cross-connection control devices at interfaces to the potable water main, and secondary control devices at the point of use. Approximately 160 cross-connection control units were tested at BNL in 2006, including primary and secondary devices. If a problem with a cross-connection device is encountered during testing, the device is repaired and retested to ensure proper function. Copies of the cross-connection device test reports are filed with the SCDHS annually.

### 3.7.3 Underground Injection Control

Underground Injection Control (UIC) wells are regulated under the SDWA. At the Laboratory, UICs include drywells, cesspools, septic tanks, and leaching pools, all of which are classified by EPA as Class V injection wells. Proper management of UIC devices is vital for protect-

ing underground sources of drinking water. In New York State, the UIC program is implemented through EPA, because NYSDEC has not adopted UIC regulatory requirements. (Note: New York State regulates discharges of pollutants to cesspools under the SPDES program.) Under EPA's UIC program, all Class V injection wells must be included in an inventory maintained with the agency. In 2006, a single UIC that was not in BNL's original permit was found outside the north side of Building 912. Inspection of the cesspool showed it to be dry and apparently unused for many years. The cesspool was sampled and will be closed, assuming the analytical data show no impacts to underlying soils.

In addition to the UICs maintained for routine Laboratory discharges of sanitary waste and stormwater, UICs also are maintained at several on- and off-site treatment facilities used for groundwater remediation. Contaminated groundwater is treated and then returned to the aquifer via drywells, injection wells, or recharge basins. Discharges to these UICs are "autho-

**Table 3-6. Potable Water Wells: Analytical Results for Principal Organic Compounds, Synthetic Organic Chemicals, Pesticides, and Micro-Extractables.**

Compound	WTP Effluent	Well No. 4	Well No. 6	Well No. 7	Well No. 10	Well No. 11	Well No. 12	NYS DWS
	µg/L							
Dichlorodifluoromethane	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
Chloromethane	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
Vinyl Chloride	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	2
Bromomethane	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
Chloroethane	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
Trichlorofluoromethane	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
1,1-dichloroethene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
Methylene Chloride	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
trans-1,2-dichloroethene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
1,1-dichloroethane	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
cis-1,2-dichloroethene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
2,2-dichloropropane	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
Bromochloromethane	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
1,1,1-trichloroethane	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	0.74	5
Carbon Tetrachloride	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
1,1-dichloropropene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
1,2-dichloroethane	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
Trichloroethene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
1,2-dichloropropane	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
Dibromomethane	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
trans-1,3-dichloropropene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
cis-1,3-dichloropropene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
1,1,2-trichloroethane	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
1,3-dichloropropane	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
Chlorobenzene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
1,1,1,2-tetrachloroethane	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
Bromobenzene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
1,2,3-trichloropropane	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
2-chlorotoluene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
4-chlorotoluene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
1,3-dichlorobenzene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
1,4-dichlorobenzene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
1,2-dichlorobenzene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
1,2,4-trichlorobenzene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
Hexachlorobutadiene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
Tetrachloroethene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
1,1,2,2-Tetrachloroethane	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
1,2,3-trichlorobenzene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5

*(continued on next page)*

CHAPTER 3: COMPLIANCE STATUS

**Table 3-6. Potable Water Wells: Analytical Results for Principal Organic Compounds, Synthetic Organic Chemicals, Pesticides, and Micro-Extractables** (continued).

Compound	WTP Effluent	Well No. 4	Well No. 6	Well No. 7	Well No. 10	Well No. 11	Well No. 12	NYS DWS
	µg/L							
Benzene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
Toluene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
Ethylbenzene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
m,p-xylene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
o-xylene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
Styrene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
Isopropylbenzene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
n-propylbenzene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
1,3,5-trimethylbenzene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
tert-butylbenzene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
1,2,4-trimethylbenzene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
sec-butylbenzene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
4-Isopropyltoluene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
n-butylbenzene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
Chloroform	1.2	4.5	12.9	1.4	0.83	0.93	< MDL	50
Bromodichloromethane	2	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	50
Dibromochloromethane	1.4	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	50
Bromoform	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	50
Methyl tert-butyl ether	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	50
Lindane	NR	NA	< MDL	< MDL	< MDL	< MDL	< MDL	0.2
Heptachlor	NR	NA	< MDL	< MDL	< MDL	< MDL	< MDL	0.4
Aldrin	NR	NA	< MDL	< MDL	< MDL	< MDL	< MDL	5
Heptachlor Epoxide	NR	NA	< MDL	< MDL	< MDL	< MDL	< MDL	0.2
Dieldrin	NR	NA	< MDL	< MDL	< MDL	< MDL	< MDL	5
Endrin	NR	NA	< MDL	< MDL	< MDL	< MDL	< MDL	0.2
Methoxychlor	NR	NA	< MDL	< MDL	< MDL	< MDL	< MDL	40
Toxaphene	NR	NA	< MDL	< MDL	< MDL	< MDL	< MDL	3
Chlordane	NR	NA	< MDL	< MDL	< MDL	< MDL	< MDL	2
Total PCBs	NR	NA	< MDL	< MDL	< MDL	< MDL	< MDL	0.5
2,4,5,-TP (Silvex)	NR	NA	< MDL	< MDL	< MDL	< MDL	< MDL	10
Dinoseb	NR	NA	< MDL	< MDL	< MDL	< MDL	< MDL	50
Dalapon	NR	NA	< MDL	< MDL	< MDL	< MDL	< MDL	50
Picloram	NR	NA	< MDL	< MDL	< MDL	< MDL	< MDL	50
Dicamba	NR	NA	< MDL	< MDL	< MDL	< MDL	< MDL	50
Pentachlorophenol	NR	NA	< MDL	< MDL	< MDL	< MDL	< MDL	1
Hexachlorocyclopentadiene	NR	NA	< MDL	< MDL	< MDL	< MDL	< MDL	5
Bis(2-ethylhexyl)Phthalate	NR	NA	< MDL	< MDL	< MDL	< MDL	< MDL	50
Bis(2-ethylhexyl)Adipate	NR	NA	< MDL	< MDL	< MDL	< MDL	< MDL	50

(continued on next page)

**Table 3-6. Potable Water Wells: Analytical Results for Principal Organic Compounds, Synthetic Organic Chemicals, Pesticides, and Micro-Extractables (concluded).**

Compound	WTP	Well	Well	Well	Well	Well	Well	NYS DWS
	Effluent	No. 4	No. 6	No. 7	No. 10	No. 11	No. 12	
	µg/L							
Hexachlorobenzene	NR	NA	< MDL	< MDL	< MDL	< MDL	< MDL	5
Benzo(A)Pyrene	NR	NA	< MDL	< MDL	< MDL	< MDL	< MDL	50
Aldicarb Sulfone	NR	NA	< MDL	< MDL	< MDL	< MDL	< MDL	SNS
Aldicarb Sulfoxide	NR	NA	< MDL	< MDL	< MDL	< MDL	< MDL	SNS
Aldicarb	NR	NA	< MDL	< MDL	< MDL	< MDL	< MDL	SNS
Oxamyl	NR	NA	< MDL	< MDL	< MDL	< MDL	< MDL	50
3-Hydroxycarbofuran	NR	NA	< MDL	< MDL	< MDL	< MDL	< MDL	50
Carbofuran	NR	NA	< MDL	< MDL	< MDL	< MDL	< MDL	40
Carbaryl	NR	NA	< MDL	< MDL	< MDL	< MDL	< MDL	50
Methomyl	NR	NA	< MDL	< MDL	< MDL	< MDL	< MDL	50
Glyphosate	NR	NA	< MDL	< MDL	< MDL	< MDL	< MDL	50
Diquat	NR	NA	< MDL	< MDL	< MDL	< MDL	< MDL	50
1,2-dibromoethane (EDB)	NR	NA	< MDL	< MDL	< MDL	< MDL	< MDL	0.05
1,2-dibromo-3-chloropropane	NR	NA	< MDL	< MDL	< MDL	< MDL	< MDL	0.2
2,4,-D	NR	NA	< MDL	< MDL	< MDL	< MDL	< MDL	50
Alachlor	NR	NA	< MDL	< MDL	< MDL	< MDL	< MDL	2
Simazine	NR	NA	< MDL	< MDL	< MDL	< MDL	< MDL	50
Atrazine	NR	NA	< MDL	< MDL	< MDL	< MDL	< MDL	3
Metolachlor	NR	NA	< MDL	< MDL	< MDL	< MDL	< MDL	50
Metribuzin	NR	NA	< MDL	< MDL	< MDL	< MDL	< MDL	50
Butachlor	NR	NA	< MDL	< MDL	< MDL	< MDL	< MDL	50
Endothall	NR	NA	< MDL	< MDL	< MDL	< MDL	< MDL	100
Propachlor	NR	NA	< MDL	< MDL	< MDL	< MDL	< MDL	50

**Notes:**

See Chapter 7, Figure 7-3 for well locations.

For compliance determination with New York State Department of Health standards, potable water samples were analyzed quarterly for principal organic compounds and annually for other organics by H2M Labs Inc., a New York State-certified contractor laboratory.

The minimum detection limits for principal organic compound analytes are 0.5 µg/L. Minimum detection limits for synthetic organic chemicals, and micro-extractables are compound specific, and in all cases are less than the New York State Department of Health drinking water standard.

< MDL = Less than the Minimum Detection Limit for the analyte in question

NA = Not available

NR = Analysis Not Required

SNS = Drinking Water Standard Not Specified

NYS DWS = New York State Drinking Water Standard

WTP = Water Treatment Plant

alized by rule” rather than by permit. Under the “authorized by rule” requirements, a separate inventory is maintained for these treatment facilities and periodically updated whenever a new device is added or closed.

### 3.8 PREVENTING AND REPORTING SPILLS

Federal, state, and local regulations are in

place to address the management of storage facilities containing chemicals, petroleum, and other hazardous materials. The regulations include specifications for the design of storage facilities, requirements for written plans relating to unplanned releases, and requirements for reporting any releases that do occur. BNL’s compliance with these regulations is described below.

**3.8.1 Preventing Oil Pollution and Spills**

As required by the Oil Pollution Act, BNL must maintain a Spill Prevention Control and Countermeasures (SPCC) Plan as a condition of its license to store petroleum fuel. The SPCC Plan is part of the Laboratory’s emergency preparedness program and outlines mitigating and remedial actions that would be taken in the event of a major petroleum release. The plan also provides information regarding release prevention measures, the design of storage facilities, and maps detailing their locations. The SPCC Plan is filed with NYSDEC, EPA, and DOE, and was last updated in December 2000 (Chaloupka 2000). BNL remained in full compliance with the SPCC requirements in 2006.

In July 2002, EPA adopted significant changes to the SPCC regulations that extended the requirements to previously unregulated facilities and provided some relief to existing covered facilities. These changes, among others, included extending the plan update deadline from 3 to 5 years, and specifying that containers smaller than 55 gallons need not be counted toward reaching SPCC applicability. In February 2006, EPA extended the timeline for updating and implementing BNL’s SPCC plan to incorporate these and other changes to October 2007, although the Laboratory is proceeding with updates to the plan and expects the changes to be completed before that date. Additional pending legislation may extend the deadline for updating the SPCC to 2009.

BNL also maintains a Facility Response Plan (FRP) (Lee 2006) that outlines emergency response procedures to be implemented in the event of a worst-case discharge of oil. In October 2005, EPA reviewed the Laboratory’s FRP and responded with numerous comments. The FRP was revised in February 2006 to address EPA’s comments. In July 2006, EPA conducted a

site visit at BNL’s request to review the changes and review the Laboratory’s response procedures; the FRP was approved by EPA in September 2006.

**3.8.2 Emergency Reporting Requirements**

The Emergency Planning and Community Right-to-Know Act (EPCRA) and Title III of the Superfund Amendments and Reauthorization Act (SARA) require that facilities report inventories (i.e., Tier II Report) and releases (i.e., Tier III Report) of certain chemicals that exceed specific release thresholds. These reports are submitted to the local emergency planning committee and the state emergency response commission. Community Right-to-Know requirements are codified under 40 CFR Parts 355, 370, and 372. Table 3-1 summarizes the applicability of the regulations to BNL. The Laboratory complied with these requirements in 2006 through the submittal of reports under EPCRA Sections 302, 303, 311, and 312. In 2006, through the Tier III report, BNL reported releases of lead (~ 84,750 pounds), mercury (~ 101 pounds), PCBs (~ 93 pounds), benzo(g,h,i)perylene (< 1 pound), and polycyclic aromatic compounds (< 1 pound). “Releases” of lead, PCBs, and mercury were predominantly in the form of shipments of waste for off-site recycling or disposal. Releases of benzo(g,h,i)perylene and polycyclic aromatic compounds were as byproducts of the combustion of fuel oils. In 2006, there were no releases of “extremely hazardous substances” that are reportable under Part 304.

**3.8.3 Spills and Releases**

When a spill of hazardous material occurs, Laboratory and contractor personnel are required to immediately notify the on-site Fire Rescue Group, whose members are trained to

Applicability of EPCRA to BNL				
EPCRA 302–303	Planning Notification	YES [X]	NO [ ]	NOT REQUIRED [ ]
EPCRA 304	EHS Release Notification	YES [ ]	NO [ ]	NOT REQUIRED [X]
EPCRA 311–312	MSDS/Chemical Inventory	YES [X]	NO [ ]	NOT REQUIRED [ ]
EPCRA 313	TRI Reporting	YES [X]	NO [ ]	NOT REQUIRED [ ]

respond to such releases. The initial step in spill response is to contain and control any release and to notify additional response personnel (i.e., BNL environmental professionals, industrial hygienists, etc.). Environmental professionals reporting to the scene assess the spill for environmental impact and determine if it is reportable to regulatory agencies. Any release of petroleum products to soil must be reported to both NYSDEC and SCDHS, and any release impacting surface water must also be reported to the EPA National Response Center. In addition, a release of more than 5 gallons of petroleum product to impermeable surfaces or containment areas must be reported to NYSDEC and SCDHS. Spills of

chemicals in quantities greater than the CERCLA-reportable limits must be reported to the EPA National Response Center, NYSDEC, and SCDHS. Remediation of the spill is conducted, as necessary, to prevent impacts to the environment, minimize human health exposures, and restore the site.

During 2006, there were 27 spills, seven of which met regulatory agency reporting criteria. The remaining 20 spills were small-volume releases either to containment areas or to other impermeable surfaces that did not exceed a reportable quantity. Four of the seven reported releases involved very small volumes (< 2 gallons) of ethylene glycol spilled from employee- or Laboratory-owned vehicles. Two releases

**Table 3-7. Summary of Chemical and Oil Spill Reports.**

Spill No. and Date	Material and Quantity	ORPS Report	Source/Cause and Corrective Actions
06-09 07/18/06	ethylene glycol/water 1 gallon	No	A Laboratory visitor was at the main gate trailer when the radiator in his vehicle failed, spilling approximately 1 gallon of antifreeze to the asphalt parking lot. Roads and Grounds personnel responded and cleaned up the release with speedy dry, and containerized the waste for off-site disposal.
06-10 07/19/06	hydraulic fluid 1 gallon	No	A front-end loader was being used to move a fallen tree off the north gate access road. As it was pushing the tree off the road, a branch ripped the hydraulic hose, releasing approximately 1 gallon of hydraulic fluid to the ground. The majority of the fluid leaked onto the road, but approximately 1 quart reached soil. Emergency Services applied speedy dry, Security closed off the road (at William Floyd Parkway), and Roads and Grounds staff cleaned up and containerized the spill debris for off-site disposal.
06-15 09/06/06	ethylene glycol/water 2 gallons	No	During grading and application of recycled concrete aggregate on a dirt road (east of Buildings 610 and 528), a hose clamp broke on the dump truck radiator, causing the hose to come loose and spill approximately 2 gallons of antifreeze to the ground. Roads and Ground personnel excavated and containerized the impacted soil for off-site disposal.
06-17 09/22/06	diesel fuel ½ gallon	No	A fuel line leak from BNL's Fire Brush truck occurred while Emergency Services personnel were practicing the use of equipment (the Brush Truck). Release was to sand. Emergency Services personnel removed most of affected sand and Roads and Grounds cleaned up residual material that was stained. The contaminated soil was placed into a plastic drum (10-gal) for off-site disposal.
06-21 09/27/06	ethylene glycol/water 1 gallon	No	Upon exiting the vehicle, the driver of a BNL step van noticed it was leaking antifreeze and notified appropriate staff. Fire Rescue responded and applied speedy dry. The vehicle was towed away, and the material was containerized for off-site disposal.
06-24 10/26/06	hydraulic fluid ½ gallon	No	A tractor trailer being used to transport excavated soils for off-site disposal experienced a small leak of hydraulic fluid while dumping some of its payload on the ground. The prime contractor for the excavation project had spill equipment handy (i.e., absorbent pads) and was able to capture most of the leak. Some of the hydraulic fluid was released to the soil on the dirt road. The contractor's front-end loader was used to immediately clean up the impacted area and the material was placed on plastic for ultimate disposal. The impacted soil and absorbent pads (~½ drum) were containerized and disposed of off-site.
06-25 11/20/06	ethylene glycol/water 2 gallons	No	An unknown vehicle developed a leak of ethylene glycol after entering the site. The vehicle started leaking at the traffic light at Upton Road and Princeton Avenue, traveled to the Vehicle Monitoring Station turnaround area, turned around, and then left the site. BNL Fire Rescue personnel applied speedy dry to the spill and Roads and Grounds containerized the material for off-site disposal.

Note:

\* Reportable under the Occurrence Reporting and Processing System (ORPS), established by the requirements of DOE Order 231.1A.

were from hydraulic systems on earth-moving equipment. In both cases the releases were 1 gallon or less, but because they reached the soil they were reportable in New York State, which has a “zero tolerance” level for releases of petroleum products to soil or water. There was one spill of diesel fuel, less than a half gallon, from a Fire/Rescue off-road vehicle, during a field exercise. Table 3-7 summarizes each of the reportable incidents, including a description of the cause and corrective actions taken. There were no spills reportable through the DOE Occurrence Reporting and Processing System (ORPS), a system for identifying, categorizing, notifying,

investigating, analyzing, and reporting to DOE events or conditions discovered on site.

The Laboratory has been very successful in reducing the number and severity of spills on site. In 2006, the total number of spills was reduced by 21 percent, from 34 spills in 2005 to 27 in 2006. Reportable spills were reduced by 50 percent, from 14 in 2005 to 7 in 2006. Measures employed to achieve this reduction included: replacing petroleum-based lubricants and fluids with vegetable-based products, installing stainless steel–reinforced hydraulic lines on various pieces of equipment, and training staff in proper spill-response techniques.

**Table 3-8. Summary of Other Environmental Occurrence Reports.**

<p>ORPS* ID: SC-BHSO-BNL-BNL-2006-0003</p> <p>A Potentially Inadequate Safety Evaluation (PISA) was noted for several ventilation stacks serving the Radioactive Waste Storage and Handling Facility that were found to be corroding. While there was no threat of release, the PISA was issued due to the degraded stacks. All stacks have been repaired.</p>	<p>Date: 01/23/06</p> <p>Status: Closed.</p> <p>All corrective actions have been completed.</p>
<p>ORPS* ID: SC-BHSO-BNL-BNL-2006-0007</p> <p>During a routine radiological contamination control survey of a Radioactive Material Area, tritium contamination was discovered. The maximum level of contamination was 209,000 dpm. The contaminated areas were covered with plastic to prevent the spread of contamination, and the floor tiles were removed and replaced. All corrective actions have been completed.</p>	<p>Date: 03/09/06</p> <p>Status: Closed.</p> <p>All corrective actions have been completed.</p>
<p>ORPS* ID: SC-BHSO-BNL-BNL-2006-0012</p> <p>A dumpster containing debris collected from the High Flux Beam Reactor activated the radiation alarm at the Laboratory’s vehicle monitor. An external survey identified the source as a small piece of metal, approximately 0.2 sq. in. that registered 5 mrem/hour. The activated metal was recovered.</p>	<p>Date: 08/08/06</p> <p>Status: Closed.</p> <p>All corrective actions have been completed.</p>
<p>ORPS* ID: SC-BHSO-BNL-BNL-2006-0016</p> <p>While exiting a Controlled Area at the Brookhaven Graphite Research Reactor, a staff member alarmed the personnel contamination monitor. Upon investigation, a small area of contamination was found on the heel of the worker’s shoe. Examination of the worker’s footpath showed some loose contamination on a hallway mat and several areas of fixed contamination. There was no other loose contamination discovered, and a survey of staff shoes showed all to be clean.</p>	<p>Date: 09/27/06</p> <p>Status: Closed.</p> <p>All corrective actions have been completed.</p>
<p>ORPS ID: SC-BHSO-BNL-PE-2006-0003</p> <p>A Notice of Violation (NOV) was issued on May 16, 2006 by the New York State Department of Conservation for opacity violations that were self-reported for the Central Steam facility. The NOV cites a period of non-compliance beginning on April 1, 2005 and ending on September 30, 2005. The cause was routine soot blowing performed at the Central Steam Facility to maintain boiler efficiency. Reprogramming of the soot blowers has resolved the issue. There have been no opacity excursions reported since August 2005.</p>	<p>Date: 05/22/06</p> <p>Status: Closed.</p> <p>All corrective actions have been completed.</p>
<p>ORPS ID: SC-BHSO-BNL-NSLS-2006-0001</p> <p>Although the release of 1 liter of acetonitrile did not exceed a reportable quantity, management concern over exposures to staff cleaning up the release and potential release to the sanitary sewer necessitated this report. Evaluation of this incident showed that staff was not exposed and there was a small release to the BNL sanitary sewer. Diversion of the plant effluent precluded a release to the Peconic River. All action items have been completed.</p>	<p>Date: 07/19/06</p> <p>Status: Closed.</p> <p>All corrective actions have been completed.</p>
<p>ORPS ID: EM-BHSO-BNL-HFBR-2006-0001</p> <p>During routine inspections of the High Flux Beam Reactor (HFBR), a field engineer noticed that the HVAC cooling tower had no water flowing through it. Upon investigation, the engineer noticed water on the equipment level floor due to leaking water from the circulation pump. In total, 26,000 gallons of water was lost to the floor. The water became tritiated due to the high levels of absorbed tritium in the HFBR structure and components. The water was recovered and transferred to the Waste Concentration Facility for storage prior to off-site disposal.</p>	<p>Date: 09/25/06</p> <p>Status: Open.</p> <p>One action remains open.</p>

Note:

\* Reportable under the Occurrence Reporting and Processing System (ORPS), established by the requirements of DOE Order 231.1A.

While there were no spills reported through ORPS in 2006, there were seven ORPS reports that were environmental in nature. These events have been summarized in Table 3-8. All incidents were addressed through the identification and implementation of corrective actions addressing the root cause. No off-site or on-site permanent environmental impacts arose from the ORPS-reported incidents.

#### 3.8.4 Major Petroleum Facility License

The storage of 2.3 million gallons of fuel oil (principally No. 6 oil) subjects the Laboratory to Major Petroleum Facility (MPF) licensing by NYSDEC. The fuel is used at the CSF to produce high pressure steam to heat and cool BNL facilities. During 2006, the Laboratory remained in full compliance with the MPF license requirements, which include monitoring groundwater in the vicinity of the six active, aboveground storage tanks that range in capacity from 300,000 to 600,000 gallons. The license also requires BNL to inspect the storage facilities monthly and test the systems for leak detection, high-level monitoring, and secondary containment. Tank integrity is also checked periodically. Groundwater monitoring consists of monthly checks for the presence of floating products and twice-yearly analyses for VOCs and semi-volatile organic compounds (SVOCs). In 2006, no VOCs, SVOCs, or floating products attributable to MPF activities were detected. See SER Volume II, Groundwater Status Report, for additional information on groundwater monitoring results.

In 2006, upgrades and/or inspections were performed at the MPF. In July, in-depth integrity tests of the secondary containment berms at the MPF were conducted to ensure that they will adequately impede the migration of oil in the event of a spill. The berms for tanks 3, 4, 9, and 10 were found to be in substantial compliance with secondary containment requirements. However, one small area in the secondary containment berm for tanks 5 and 6 did not meet the permeability requirements of the MPF License. Additional testing was performed in December 2006, which confirmed the original results. Engineering plans will be prepared and

implemented in 2007 to address this deficiency.

In September, NYSDEC conducted its annual inspection. Two conditions that required corrective action were noted: the management of vegetative growth in the secondary containment berms at Building 610, and the need for further evaluation of the secondary containment system for tanks 5 and 6, based on the results of the in-depth integrity tests performed in July.

#### 3.8.5 Chemical Bulk Storage

Title 6 of the Official Compilation of the Codes, Rules and Regulations of the State of New York (NYCRR), Part 597, requires that all aboveground tanks larger than 185 gallons and all underground tanks that store specific chemicals be registered with NYSDEC. The Laboratory holds a Hazardous Substance Bulk Storage Registration Certificate for eight tanks. Seven of the tanks store treatment chemicals for potable water (sodium hydroxide and sodium hypochlorite) and one tank stores gallium trichloride, formerly required in physics experiments. The tanks range in capacity from 200 to 1,200 gallons. These tanks are also regulated under Suffolk County Sanitary Code (SCSC) Article 12 (SCDHS 1993) and are managed in accordance with BNL procedures designed to conform to Suffolk County requirements.

NYSDEC conducted an inspection of the Chemical Bulk Storage (CBS) facilities in September 2006. During this inspection, one issue was identified that required corrective action: the need to add open/close position signs for several control valves associated with caustic tanks at Well Houses 10 and 12. This issue was immediately corrected in accordance with the NYSDEC directive.

#### 3.8.6 County Storage Requirements

Article 12 of the SCSC regulates the storage and handling of toxic and hazardous materials in aboveground or underground storage tanks, drum storage facilities, piping systems, and transfer areas. Article 12 specifies design criteria to prevent environmental impacts resulting from spills or leaks and specifies administrative requirements such as identification, registration, and spill reporting procedures. In 1987, the Lab-

oratory entered into a voluntary Memorandum of Agreement with SCDHS, in which DOE and BNL agreed to conform to the environmental requirements of Article 12.

Currently, there are 357 active storage facilities at BNL for wastewater, chemicals, and fuel (some fuel facilities are regulated under the MPF license), as well as storage facilities used to support BNL research. An additional 33 storage facilities are temporarily out of service. The Laboratory has five active storage facilities associated with environmental restoration activities conducted under the CERCLA program; these are not regulated under Article 12.

BNL has an ongoing program to upgrade or replace existing storage facilities, to ensure that the information provided to SCDHS for all registered storage facilities is accurate, and to ensure that new or modified storage facilities are designed and reviewed for full conformance with Article 12 regulations. In 2006, the Laboratory continued to provide SCDHS with updated information regarding several registered tanks, including a request to abandon the Building 801 F-Tanks and Building 510 Source Tubes. The request was approved by SCDHS. In addition, one of the last single-walled underground storage tanks was removed in September 2006 and replaced with an aboveground tank that complies with SCSC Article 12.

### 3.9 RCRA REQUIREMENTS

The Resource Conservation and Recovery Act (RCRA) regulates hazardous wastes that, if mismanaged, could present risks to human health or the environment. The regulations are designed to ensure that hazardous wastes are managed from the point of generation to final disposal. In New York State, EPA delegates the RCRA program to NYSDEC, with EPA retaining an oversight role. The Laboratory is considered a large-quantity generator because it may generate greater than 1,000 Kg (2,200 pounds) of hazardous waste in a month, and has a RCRA permit to store hazardous wastes for up to one year before shipping them off site to licensed treatment and disposal facilities. As noted in Chapter 2, BNL also has a number of satellite accumulation and 90-day waste storage areas.

Mixed wastes are materials that are both hazardous (under RCRA guidelines) and radioactive. The Federal Facilities Compliance Act (1992) requires that DOE work with local regulators to develop a site treatment plan to manage mixed waste. Development of the plan has two purposes: to identify available treatment technologies and disposal facilities (federal or commercial) that are able to manage mixed waste produced at federal facilities, and to develop a schedule for treating and disposing of these waste streams.

BNL's Site Treatment Plan is updated annually and submitted to NYSDEC for review. The updated plan documents the current mixed waste inventory and describes efforts undertaken to seek new commercial treatment and disposal outlets for various waste streams. Treatment options for all of the mixed waste now in storage have been identified. The Laboratory anticipates that it will continue to manage mixed wastes within its permitted one-year storage limitation, and will continue to maintain and update its Site Treatment Plan as a reporting mechanism, should waste types or treatment facility availability change in the future.

### 3.10 POLYCHLORINATED BIPHENYLS

The storage, handling, and use of polychlorinated biphenyls (PCBs) are regulated under the Toxic Substances Control Act (TSCA). Capacitors manufactured before 1970 that are believed to be oil filled are handled as if they contain PCBs, even when that cannot be verified from the manufacturer's records. All equipment containing PCBs must be inventoried, except for capacitors containing less than 3 pounds of dielectric fluid and items with a concentration of PCB source material of less than 50 parts per million. Certain PCB-containing articles or PCB containers must be labeled. The inventory is updated by July 1 of each year. The Laboratory responds to any PCB spill in accordance with standard emergency response procedures. BNL was in compliance with the regulatory requirements in 2006.

The Laboratory has aggressively approached reductions in its PCB inventory. By replacing and disposing of 128 large capacitors from the

Collider-Accelerator Department in 2006, the inventory was reduced an additional 51 percent. Since 2003, BNL has reduced its PCB inventory by more than 90 percent.

### 3.11 PESTICIDES

The storage and application of pesticides (insecticides, rodenticides, herbicides, and algicides) are regulated under the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA). Pesticides are used at the Laboratory to control undesirable insects, mice, and rats; bacteria in cooling towers; and to maintain certain areas free of vegetation (e.g., around fire hydrants and inside secondary containment berms). Insecticides are also applied to agricultural research fields and in greenhouses on site. Herbicide use is minimized wherever possible (e.g., through spot treatment of weeds). All pesticides are applied by BNL-employed, New York State-certified applicators. By February 1, each applicator files an annual report with NYSDEC detailing insecticide, rodenticide, algicide, and herbicide use for the previous year. The Laboratory was in full compliance with the legislated requirements in 2006.

### 3.12 WETLANDS AND RIVER PERMITS

As noted in Chapter 1, portions of the BNL site are situated on the Peconic River floodplain. Portions of the Peconic River are listed by NYSDEC as “scenic” under the Wild, Scenic, and Recreational River Systems Act. The Laboratory also has six areas regulated as wetlands and a number of vernal (seasonal) pools. Construction or modification activities performed within these areas require permits from NYSDEC.

Activities that could require review under the BNL Natural and Cultural Resource Management Programs are identified during the NEPA process (see Section 3.3). In the preliminary design stages of a construction project, design details required for the permit application process are specified. These design details ensure that the construction activity will not negatively affect the area, or if it does, that the area will be restored to its original condition. When design is near completion, permit applications are filed. During and after construction, the Laboratory

must comply with the permit conditions.

In 2006, three projects that were started in 2005 were granted permits under this program. These projects included constructing a new recharge basin, a storage facility at the Alternating Gradient Synchrotron (AGS), and ancillary structures at Buildings 1007 and 1009. All projects have been completed except for new structures at Buildings 1007 and 1009, which are no longer planned; the permit will be cancelled in 2007. Final photos and completed project notifications for construction of the AGS storage facility were submitted in 2006, and this permit was closed. Final photos for the recharge basin will be submitted in 2007, along with the permit completion notice to close this permit.

### 3.13 ENDANGERED SPECIES ACT

In 2006, the Laboratory updated its list of endangered, threatened, and species of special concern (see Table 6-1 in Chapter 6). Although the tiger salamander is no longer the only state endangered species found at BNL, it is the most notable and best-studied species on site. Tiger salamanders are listed as endangered in New York State because populations have declined due to habitat loss through development, road mortality during breeding migration, introduction of predatory fish into breeding sites, historical collection for the bait and pet trade, water level fluctuations, pollution, and general disturbance of breeding sites. The Laboratory adopted and implemented the BNL Natural Resource Management Plan (NRMP) in December 2003. One component of the plan formalizes the strategy and actions needed to protect 22 confirmed tiger salamander breeding locations on site. The strategy includes identifying and mapping habitats, monitoring breeding conditions, improving breeding sites, and controlling activities that could negatively affect breeding. A multi-year study of three ponds was begun in 2004 to gain a better understanding of the habitat requirements and salamander movement.

The banded sunfish and swamp darter are found in the Peconic River drainage areas at BNL. Both are listed as threatened species within New York State. Eastern Long Island has the only known remaining populations of these fish

in New York. Measures taken or being taken by the Laboratory to protect the banded sunfish and swamp darter and their habitat include: eliminating, reducing, or controlling pollutant discharges; reducing nitrogen loading in the Peconic River; monitoring populations and water quality to ensure that habitat remains viable; maintaining adequate flow to the river to enable the fish to survive drought; and minimizing disturbances to the river and adjacent banks.

Three butterfly species that are endangered, threatened, or of special concern have been historically documented at the Laboratory; these include the frosted elfin, persius duskywing, and mottled duskywing. None have been documented in recent surveys. Habitat for the frosted elfin and persius duskywing exists on Laboratory property and mottled duskywing is likely to exist on site; therefore, the management of habitat and surveys for the three butterflies has been added to the NRMP.

Surveys for damselflies and dragonflies conducted annually during the summer months confirmed the presence of one of the three threatened species of damselflies expected to be found on site. In June 2005, the pine-barrens bluet (*Enallagma recurvatum*), a threatened species, was documented at one of the many coastal plain ponds located at BNL.

The Laboratory is also home to 14 species that are listed as species of special concern. Such species have no protection under the state endangered species laws, but may be protected under other state and federal laws (e.g., Migratory Bird Treaty Act). New York State monitors species of special concern and manages their populations and habitats, where practical, to ensure that they do not become threatened or endangered. Species of special concern found at BNL include the mottled duskywing butterfly, marbled salamander, eastern spadefoot toad, spotted turtle, eastern box turtle, eastern hognose snake, worm snake, horned lark, whip-poor-will, vesper sparrow, grasshopper sparrow, and Cooper's hawk. The management efforts for the tiger salamander also benefit the marbled salamander. At present, no additional protective measures are planned for the eastern box turtle or spotted turtle, as little activity oc-

curs within their known habitat at the Laboratory. Radio telemetry work on the spotted turtle was carried out in 2004 – 2006, and a basic understanding of their movement and habitat needs was developed. A radio telemetry study on the eastern hognose snake was completed in 2005, resulting in greater understanding of this species' habitat needs and its movement between habitats. BNL continues to evaluate bird populations as part of the management strategy outlined in the NRMP. In addition to the bird species mentioned above, 18 other bird species listed as species of special concern and two federally threatened species have been observed during spring and fall migrations.

The Laboratory has 20 plant species that are protected under state law. One is an endangered plant, the crested fringed orchid; two are threatened plants, the stiff goldenrod and stargrass; and two are rare plants, the narrow-leaved bush clover and long-beaked bald-rush. The other 15 species are considered to be "exploitably vulnerable," meaning that they may become threatened or endangered if factors that result in population declines continue. These plants are currently sheltered at BNL due to the large areas of undeveloped pine-barren habitat on site. As outlined in the NRMP, locations of these rare plants must be determined, populations estimated, and management requirements established. See Chapter 6 for further details.

### 3.14 EXTERNAL AUDITS AND OVERSIGHT

#### 3.14.1 Regulatory Agency Oversight

A number of federal, state, and local agencies oversee BNL activities. In 2006, BNL was inspected by federal, state, or local regulators on 10 occasions and SCDHS continued to maintain a part-time, on-site inspector who provided periodic oversight of BNL activities. In addition to external audits and oversight, the Laboratory has a comprehensive self-assessment program, as described in Chapter 2.

These inspections included:

- *Air Compliance.* Although NYSDEC observed several air emissions tests, there was no formal air inspection in 2006, and no issues identified during testing observations.
- *Potable Water.* In September, SCDHS col-

lected samples and conducted its annual inspection of the BNL potable water system. No issues were identified.

- *Sewage Treatment Plant.* SCDHS conducts quarterly inspections of the Laboratory's STP, to evaluate operations and sample the effluent. In 2006, no performance or operational issues were identified. NYSDEC also conducted an annual inspection of the STP and other SPDES-regulated outfalls; no issues were identified.
- *Recharge Basins.* SCDHS inspected several of the SPDES-regulated outfalls and collected samples. No issues were identified.
- *Major Petroleum Facility.* The annual NYSDEC inspection of the MPF was conducted in August. See Section 3.8.4 for a discussion of the issues identified.
- *Chemical Bulk Storage Facilities.* The CBS facilities are inspected periodically by NYSDEC. This inspection was conducted in August (see Section 3.8.5).
- *Hazardous Waste.* NYSDEC conducted a comprehensive inspection of BNL's hazardous waste program in November, including BNL's permitted storage facility and 90-day storage areas. No issues were identified.

### 3.14.2 DOE Assessments/Inspections

Although DOE Headquarters (EH-10) and the Chicago Support Center did not conduct assessments of BNL's environmental programs in 2006, the DOE Brookhaven Site Office (BHSO) continued to oversee Laboratory programs and observed BNL's multi-topic programmatic assessment. The Environmental and Waste Management Services Division adopted a different approach to conducting its annual assessments. Rather than perform several individual assessments during the year, a single multi-topic assessment was conducted. The rationale for this change was to reduce the impact in time and resources, on both the assessors and assesses. In addition, the Laboratory also underwent an inspection by the Nevada Test Site in order to maintain its waste shipment certification. The results of these assessments and the inspection are summarized below.

#### 3.14.2.1 Environmental Multi-Topic Assessment

The multi-topic assessment included a field review of Process Assessments Forms (PAFs) and Experimental Safety Reviews (ESRs), Universal and Industrial Wastes, and Quality Assurance practices for sampling by non-environmental and waste management organizations.

In general, descriptions in the PAFs and ESRs are reflective of actual field observations and many were very accurate and required no additional information. There were two minor non-conformances identified in the management of universal and industrial wastes; both related to the labeling of waste containers. With regard to sampling practices, the field practices and other activities reviewed during the assessment were of good quality; however, the lack of formal sample collection and data review procedures leaves the opportunity for future errors. Corrective actions were identified and completed in 2006.

#### 3.14.2.2 Hazardous Material Transportation

The BNL Triennial Transportation Assessment was performed in accordance with the Transportation Safety and Operations Compliance Assurance Process (TCAP). TCAP ensures compliance with applicable regulations, policies, and orders at sites involved in transportation operations, including DOE Field oversight; identifies opportunities for process improvements in all aspects of transportation operations; and shares transportation safety and operations best practices and lessons learned throughout the DOE complex. The TCAP evaluation process is designed to assist site line personnel in identifying the cause(s) of deficiencies where they exist, and to foster the development of site management systems that continually maximize regulatory compliance, increase efficiency, and enhance worker safety.

The results of this assessment were based on the documentation provided and followed the definition of terms as established by the BHSO-OA-01, Conduct of Environmental, Safety and Health (ESH) Assessments (i.e., noteworthy items, concerns, findings, and observations). No concerns or programmatic breakdowns

**Table 3-9. Existing Agreements and Enforcement Actions Issued to BNL, with Status.**

Number	Title	Parties	Effective Date	Status
<b>Agreements</b>				
No Number	Suffolk County Agreement	SCDHS, DOE, and BNL	Originally signed on 09/23/87	This Agreement was developed to ensure that the storage and handling of toxic and hazardous materials at BNL conform with the environmental and technical requirements of Suffolk County codes.
No Number	Federal Facilities Compliance Agreement on Mixed Wastes	NYS-DEC and DOE	1992 (updated annually)	The Federal Facilities Compliance Act (FFCA) requires that a site treatment plan to manage mixed wastes be written and updated annually. BNL is in compliance with this requirement.
II-CERCLA-FFA-00201	Federal Facility Agreement under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) Section 120 (also known as the Interagency Agreement or "IAG" of the Environmental Restoration Program)	EPA, DOE, and NYSDEC	05/26/92	Provides the framework, including schedules, for assessing the extent of contamination and conducting the BNL cleanup. Work is performed either as an Operable Unit or a Removal Action. The IAG integrates the requirements of CERCLA, Resource Conservation and Recovery Act (RCRA), and the National Environmental Policy Act (NEPA). All IAG-scheduled milestones were met in 2006.
<b>Notices of Violation/Enforcement Actions</b>				
None	Notice of Violation: Title V Facility Exceedance of 6-minute opacity standards: 04/01/05 – 06/30/05	NYS-DEC and DOE	12/05/05 Received 05/16/06	The NOV cites violation of Condition 62 of BNL's Title V permit and documents 60 exceedances of BNL's 6-minute average opacity limit.
None	Notice of Violation: Title V Facility Exceedance of 6-minute opacity standards: 07/01/05 – 9/30/05	NYS-DEC and DOE	12/05/05 Received 05/16/06	The NOV cites violation of Condition 62 of BNL's Title V permit and documents 36 exceedances of BNL's 6-minute average opacity limit.

Notes:  
 EPA = Environmental Protection Agency  
 NYSDEC = New York State Department of Environmental Conservation  
 SCDHS = Suffolk County Department of Health Services

were found. There were four “significant findings” in the performance objectives of: General Management of Transportation and Packaging Programs, Hazardous and Radioactive Materials Packaging, Transportation Emergency Response, and HAZMAT Employee Training. In addition, nine “observations” were noted. Although the Laboratory met all the performance objectives of this review, no noteworthy or best-in-class items were identified. The TCAP team provides technical assistance to Brookhaven Science Associates (BSA) management and personnel throughout the evaluation process by offering recommendations based on recognized transportation and business practices and by identifying additional information and/or training sources. Nineteen recommendations were made by the team to assist BSA in improving transportation operations

at BNL. A corrective action plan was prepared and is currently underway.

*3.14.2.3 EMS Desk Assessment*

BHSO conducted a desk audit of the Laboratory’s Environmental Management System to ensure it met the requirements of Executive Order 13148, Greening the Government Through Leadership in Environmental Management. The assessment looked at five functional areas which covered all 17 elements for the implementation of the International Organization for Standardization (ISO) 14001 Standard at BNL. There were no findings or deficiencies identified during this audit.

*3.14.2.4 Nevada Test Site Inspection*

In order to ship low-level waste to the Ne-

vada Test Site (NTS) for disposal, BNL must be certified as a waste generator by the NTS Maintenance and Operations contractor. The Laboratory performed a gap analysis of the BNL Waste Management Program (WMP) and the NTS Waste Acceptance Criteria (WAC). Based on the analysis, WMP modified and created standard operating procedures to comply with NTS WAC requirements. The inspection team from NTS issued one Corrective Action Report. BNL corrected the deficiency and was certified as a waste generator in March of 2006.

### 3.14.3 Enforcement Actions and Memos

No new consent orders were issued to the Laboratory in 2006. As previously discussed, in May two Notices of Violation (NOVs) were issued for opacity excursions that were self-reported in 2005. Since all corrective actions were completed in 2005, the NOVs were considered resolved upon issuance. All existing enforcement actions and memoranda are listed in Table 3-9, along with a summary of their status. BNL and DOE have determined that the Laboratory has fully complied with the terms and conditions listed in these actions, and have submitted supporting documentation to the regulatory agencies.

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