

Compliance Status

Brookhaven National Laboratory (BNL) is subject to more than 100 sets of federal, state, and local environmental regulations; numerous site-specific permits; 18 equivalency permits for operation of 14 groundwater remediation systems; and several other binding agreements. In 2007, 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.

Emissions of nitrogen oxides, carbon monoxide, and sulfur dioxide from the Central Steam Facility were all within permit limits. Opacity excursions were noted in the first and second quarters of 2007. Approximately 1,168 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 forty-seven 17-pound Halon 1211 fire extinguishers. Monitoring BNL's potable water system showed that all drinking water requirements were met. During 2007, 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 above permit limits were reported for the year. All four occurred at the Sewage Treatment Plant and were due to slightly elevated levels of nitrogen. The permit excursions were reported to the New York State Department of Environmental Conservation 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 2007. There were 12 reportable spills of petroleum products, antifreeze, or chemicals. While the number of reportable spills increased in 2007 as compared to 2006, there were 20 percent fewer total number of spills (21 compared to 27). All releases were cleaned up to the satisfaction of the New York State Department of Environmental Conservation.

The Laboratory participated in 10 environmental audits by external regulatory agencies in 2007. These audits included inspections of petroleum and chemical storage, Sewage Treatment Plant operations, other regulated outfalls and recharge basins, and the potable water system, and the Major Petroleum Facility. Immediate corrective actions were taken to address all issues raised during these inspections. No formal enforcement actions were taken in 2007.

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 dis-

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cussion of the Laboratory’s compliance status with each. A list of all applicable environmental regulations is contained in Appendix D.

3.2 ENVIRONMENTAL PERMITS

3.2.1 Existing Permits

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

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	The Comprehensive Environmental Response, Compensation & Liability Act (CERCLA) 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 2008.	2.3.4.8
Council for Env. Quality: 40 CFR 1500–1508 DOE: 10 CFR 1021	The National Environmental Policy Act (NEPA) 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	The National Historic Preservation Act (NHPA) 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	The Clean Air Act (CAA) 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	The Clean Water Act (CWA) 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).	At 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 2007.	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 Safe Drinking Water Act (SDWA) 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 in 2007.	3.7
EPA: 40 CFR 112 40 CFR 300 40 CFR 302 40 CFR 355 40 CFR 370 40 CFR 372	The Oil Pollution Act , the Emergency Planning and Community Right-to-Know Act (EPCRA) , 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. Suffolk County Safety Codes (SCSC) are more stringent than the federal and state regulations.	The regulations require that these materials be managed in facilities equipped with secondary containment, overfill 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 Resource Conservation Recovery Act (RCRA) and New York State Solid Waste Disposal Act 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.	3.9
EPA: 40 CFR 700–763	The Toxic Substances Control Act (TSCA) 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 Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) 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 New York State Fresh Water Wetlands and Wild, Scenic, and Recreational Rivers 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 2007, there were two projects permitted under the NYS Fresh Water Program.	3.12
U.S. Fish & Wildlife Service: 50 CFR 17 NYSDEC: 6 NYCRR 182	The Endangered Species Act 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 species have been categorized by NYS as endangered, threatened, or of special concern. BNL's Natural Resource Management Plan outlines activities to protect these vulnerable species and their habitats (see Chapter 6).	3.13
DOE: Manual 231.1-1A	The Environment, Safety, and Health Reporting 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, the environment, the intended purpose of DOE facilities, or the 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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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 Quality Assurance (QA) 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 Radioactive Waste Management Program 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) and Order 450.1A	The Environmental Protection Program 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. In 2007, Order 450.1A was finalized and requires all federal agencies and contractors to include the goals of Executive Order 13423 in their EMS. These goals include energy and water conservation, renewable energy, use of alternate fuels and other "green" initiatives.	BNL's EMS was officially registered to the ISO 14001:1996 standard in 2001 and recertified to the revised standard in 2004. In June 2007, 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 the Laboratory. It describes BNL's programs, including the SBMS, for accomplishing work safely and provides the road map of the systems and processes. In accordance with Order 450.1A, BNL has included many of the Executive Order objectives in its Objectives and Targets for 2008.	Chapter 2
DOE: Order 5400.5, Change 2	To protect members of the public and the environment against undue risk from radiation, the Radiation Protection of the Public and Environment Program 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	1-52-009	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	West 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	04-May-11	NA	NA
NYSDEC - SPDES Equivalency	670	Sr-90 Treatment System	None	25-Feb-13	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	01-Aug-09	NA	NA
NYSDEC - SPDES Equivalency	855	Sr-90 Treatment System - BGRR/WCF	None	01-Jan-10	NA	NA
NYSDEC - SPDES Equivalency	TR 867	T-96 Remediation System	1-52-009	09-Mar-13	NA	NA
NYSDEC - Hazardous Substance	BNL	Bulk Storage Registration Certificate	1-000263	27-Jul-09	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

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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	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
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 and 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	RHIC	Construction of New Recharge Basin	1-4722-00032/00129	01-May-07	NA	NA
NYSDEC - Natural Resources	RHIC	Construct 9C/7C Alcove Building	1-4722-00032/00137	01-May-07	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-09	NA	NA
NYSDEC - Water Quality	STP	STP and Recharge Basins	NY-0005835	01-Mar-10	NA	NA
NYSDEC - Water Quality	1010	Install A/C @ 1010A and 1012A	1-4722-00032/00139	31-May-12	NA	NA
NYSDEC - Water Quality	1004	Installation of Blockhouse	1-4722-00032/00140	Pending	NA	NA

Notes:
 A/C = Air Conditioning
 AGS = Alternating Gradient Synchrotron
 BGRR = Brookhaven Graphite Research Reactor
 EPA = Environmental Protection Agency
 LIPA = Long Island Power Authority
 NA = Not Applicable
 NESHAPs = National Emission Standards for Hazardous Air Pollutants
 NYSDEC = New York State Department of Environmental Conservation
 NA = Not Applicable
 OU = Operable Unit
 Sr-90 = Strontium-90
 STP = Sewage Treatment Plant
 WCF = Waste Concentration Facility

Emission Standards for Hazardous Air Pollutants (NESHAPs)

- Air emissions permit issued by NYSDEC under Title V of the Clean Air Act Amendments authorizing the operation of 39 facilities
- Four 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 *Wild Scenic Recreational Rivers Act*

The Laboratory applied for two new permits under the New York State Wild Scenic and Recreational Rivers Act in 2007. These permits were for construction activities located within one-half mile of the Peconic River. The first activity included the installation of air conditioning systems at Buildings 1010A and 1012A in the Relativistic Heavy Ion Collider (RHIC) ring area, and the second activity was the relocation of a block house to Building 1004 and installation of antennae at Building 1012 and 1002. Also in 2007, work was completed under two prior permits, the first for the construction of a new facility at Building 1009C, and the second for the construction of a new recharge basin in the center of the RHIC Ring.

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 2007, no CERCLA air equivalency permits were issued or revised.

3.2.2.3 *CERCLA Permits*

In an effort to improve the efficiency of the groundwater treatment system installed for removing contaminants from the T-96 area, a SPDES-Equivalency permit was obtained for the discharge of treated water from this system to an existing recharge basin. This discharge is being treated with activated carbon for volatile organic compound (VOC) removal and with ion-exchange resins for the removal of metals.

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.

During 2007, environmental evaluations were completed for 91 proposed projects. Of these, 87 were considered minor actions requiring no additional documentation. The four remaining projects were addressed by submitting notification forms to DOE, which determined that those projects were covered by existing Categorical Exclusions 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 2007. 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 2007, 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 emission standards for oxides of nitrogen (NO_x). 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_x 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 2007 confirmed that the fuel-bound nitrogen content met these requirements. Compliance with the 0.30 lbs/MMBtu NO_x emission standards for boilers 6 and 7 was demonstrated by continuous emission monitoring of the flue gas. In 2007, NO_x emissions from Boilers 6 and 7 averaged 0.155 lbs/MMBtu and 0.115 lbs/MMBtu, respectively, and there were no known exceedances of the NO_x 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 2007, BNL reported five periods during the first calendar quarter and 22 periods during the second calendar quarter when opacity measurements for Boiler 6 exceeded the 6-minute 20 percent average during soot blowing operations. The opacity exceedances measured during the first quarter were isolated events that occurred after an extended idle period of approximately two months. During this period, excess soot accumulated while nominal volumes of oil were burned to keep the boiler warm. When the boiler was returned to normal operation, opacity excursions were noted during the initial soot blowing events. The deviations from the opacity standard recorded during the second quarter were caused by mechanical malfunction of the calibration shutter in the transmissometer optical head assembly. Opacity readings returned to normal when the optical head assembly was replaced.

3.5.1.2 Ozone-Depleting Substances Refrigerant:

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 2007, approximately 369 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 2007, BNL declared forty-seven 17-pound Halon 1211 portable fire extinguishers as excess property. The Laboratory is arranging to transfer these 47 extinguishers, along with 120 portable Halon 1211 extinguishers that were declared excess property in 2006, to the Department of Defense Ozone Depletion Substance (ODS) Reserve. This transfer will be made in accordance with the Class I Ozone Depleting Substances Disposition Guidelines prepared by the DOE Office of Environmental Policy and Guidance. The portable extinguishers became excess property 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 NESHAPs program was established in 1977 and the governing regulations were updated significantly in 1990. EPA developed NESHAPs to limit the emission of 189 toxic air pollutants. The 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 periodic review of Maximum Available Control Technology (MACT) standards, it has been determined that none of the existing, proposed, or newly promulgated MACT standards apply to the emissions from existing permitted operations or the anticipated emissions from proposed activities and operations at BNL.

3.5.2.2 Asbestos

In 2007, the Laboratory notified the EPA Region II office regarding removal of materials containing asbestos. During the year, 350 linear feet of pipe insulation, 10,303 ft² of floor tile, 2,250 ft² of asbestos-containing roofing material, and 3,542 ft² of mineral board siding were removed and disposed of according to 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 2007 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 μSv) 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 modeling software, the dose to the hypothetical maximally exposed individual resulting from BNL's airborne emissions was 0.06 mrem (0.8 μ Sv) in 2007.

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 to discharge 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 Discharge 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 Depart-

ment of Health Services (SCDHS). Details of the monitoring program conducted for the groundwater treatment systems and of SPDES equivalency permit performance are provided in SER Volume II, Groundwater Status Report.

In 2007, NYSDEC initiated a comprehensive review of the BNL SPDES permit. This review required the complete characterization of all permitted outfalls and a review of the discharges received by each outfall. Wastewater samples were collected from each outfall and analyzed for a full series of chemical and biological contaminants. The data were submitted to NYSDEC in August. No unexpected contaminants were identified through these analyses. In an effort to better understand the release of mercury to the Peconic River, wastewater samples collected from Outfall 001 were analyzed following EPA method 1631, a relatively new method that permits the analysis of mercury to the part-per-trillion level. These data show that the Sewage Treatment Plant (STP) effluent routinely contains mercury at levels at or below 100 parts-per-trillion.

3.6.1 Sewage Treatment Plant

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

A summary of 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 2007. There were four excursions of the SPDES permit limits, all for total nitrogen: two occurred in February, one in September, and one in November. In all four cases, the effluent concentrations for total nitrogen were just above the Laboratory's SPDES limit of 10 ppm, with discharges of 11.6, 11.4, 11.2, and 11.1 ppm, respectively. All other parameters were within permit limits.

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)	45	79	Daily	90	0	100
pH (SU)	6.1	7.7	Continuous Recorder	Min 5.8, Max. 9.0	0	100
Avg. 5-Day BOD (mg/L)	< 2	< 2	Twice Monthly	10	0	100
Max. 5-Day BOD (mg/L)	< 2	< 2	Twice Monthly	20	0	100
% BOD Removal	> 90	> 97	Monthly	85	0	100
Avg. TSS (mg/L)	< 0.6	1.8	Twice Monthly	10	0	100
Max. TSS (mg/L)	< 0.6	2.3	Twice Monthly	20	0	100
% TSS Removal	> 95	> 99	Monthly	85	0	100
Settleable solids (ml/L)	0	0	Daily	0.1	0	100
Ammonia nitrogen (mg/L)	0.1	0.39	Twice Monthly	2	0	100
Total nitrogen (mg/L)	4	11.6 (a)	Twice Monthly	10	4	86
Total phosphorus (mg/L)	1.02	2.09	Twice Monthly	NA	0	100
Cyanide (µg/L)	< 1.5	2.1	Twice Monthly	100	0	100
Copper (mg/L)	0.042	0.124	Twice Monthly	0.15	0	100
Iron (mg/L)	0.102	0.278	Twice Monthly	0.37	0	100
Lead (mg/L)	< 0.001	0.002	Twice Monthly	0.019	0	100
Mercury (mg/L)	< 0.00003	0.00015	Twice Monthly	0.0008	0	100
Methylene chloride (µg/L)	< 2	2.76	Twice Monthly	5	0	100
Nickel (mg/L)	0.008	0.022	Twice Monthly	0.11	0	100
Silver (mg/L)	< 0.001	0.003	Twice Monthly	0.015	0	100
Toluene (µg/L)	0.38	< 1	Twice Monthly	5	0	100
Zinc (mg/L)	0.024	0.076	Twice Monthly	0.1	0	100
1,1,1-trichloroethane (µg/L)	< 1	< 1	Twice Monthly	5	0	100
2-butanone (µg/L)	< 5	< 5	Twice Monthly	50	0	100
PCBs (µg/L)	< 0.0463	< 0.0463	Quarterly	NA	0	100
Max. Flow (MGD)	0.21	0.82	Continuous Recorder	2.3	0	100
Avg. Flow (MGD)	0.25	0.44	Continuous Recorder	NA	0	100
Avg. Fecal Coliform (MPN/100 ml)	< 2	< 2	Twice Monthly	200	0	100
Max. Fecal Coliform (MPN/100 ml)	< 2	< 2	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. of 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) Two permit exceedances of the total nitrogen limits were reported, two in February, one in September, and one in November.

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

The Laboratory has been investigating the potential sources of elevated nitrogen concentrations observed at the STP. Abnormally low flow conditions and decreased nutrients in the waste have been identified as the most likely causes of the increased nitrogen levels in the discharge. To address this issue, enzymes are now added at the plant to enhance denitrifica-

tion of the effluent by the biological organisms during treatment. BNL will continue to monitor nitrogen levels at the STP very closely, to ensure that effluent limits are met in the future. 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.

Figure 3-1. Maximum Concentrations of Copper Discharged from the BNL Sewage Treatment Plant, 2003–2007.

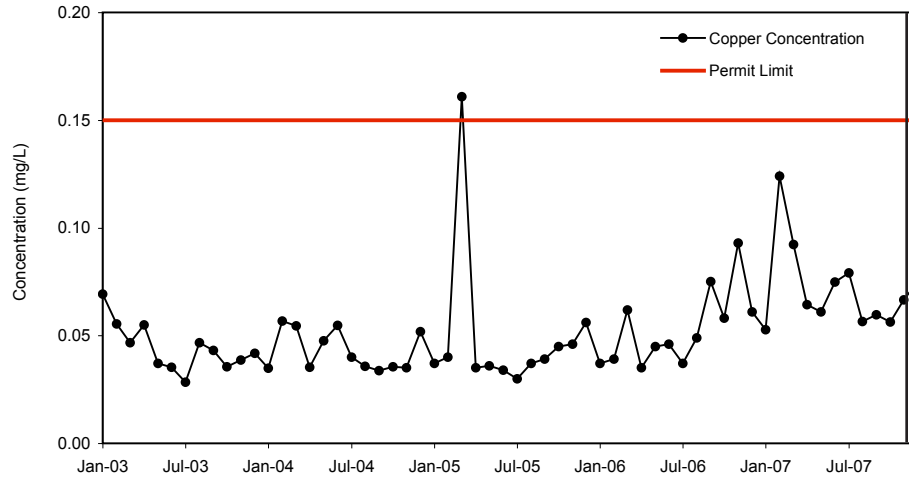


Figure 3-2. Maximum Concentrations of Iron Discharged from the BNL Sewage Treatment Plant, 2003–2007.

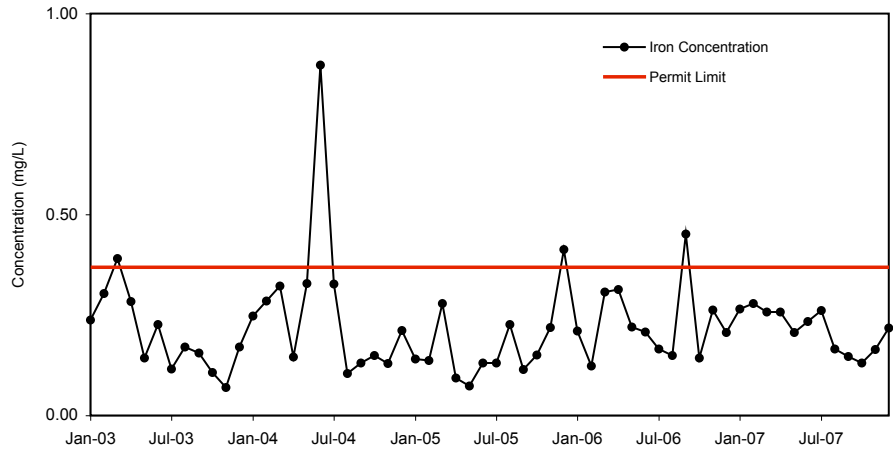
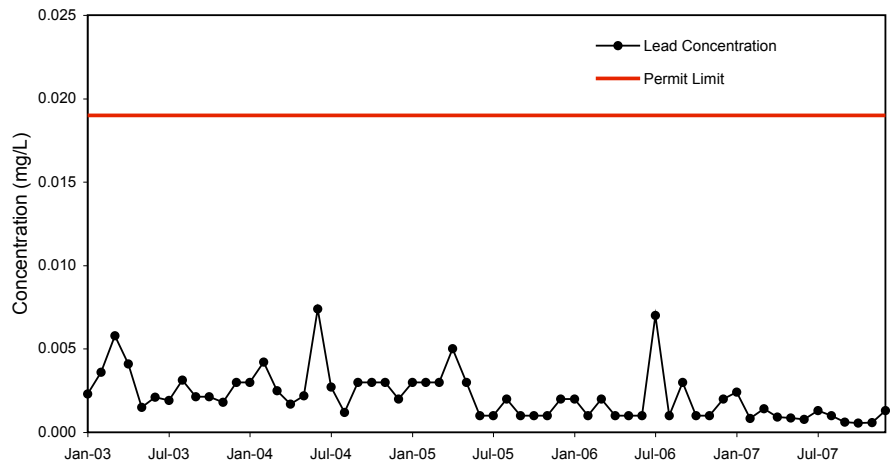


Figure 3-3. Maximum Concentrations of Lead Discharged from the BNL Sewage Treatment Plant, 2003–2007.



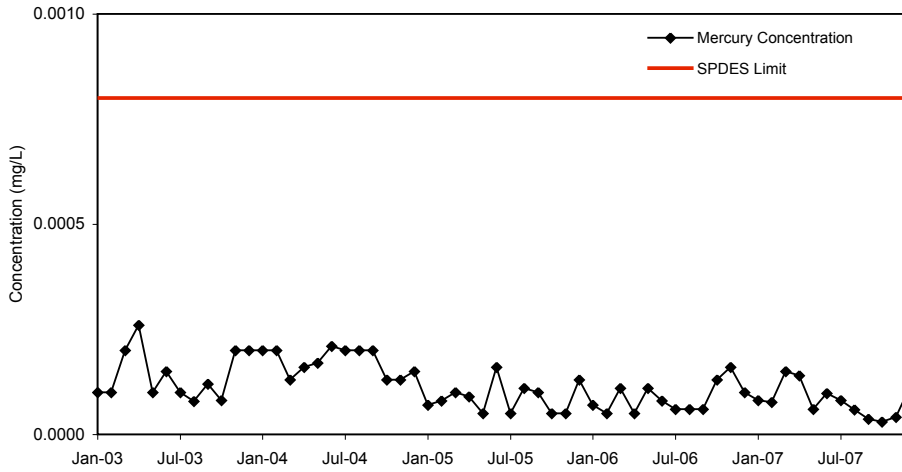


Figure 3-4. Maximum Concentrations of Mercury Discharged from the BNL Sewage Treatment Plant, 2003–2007.

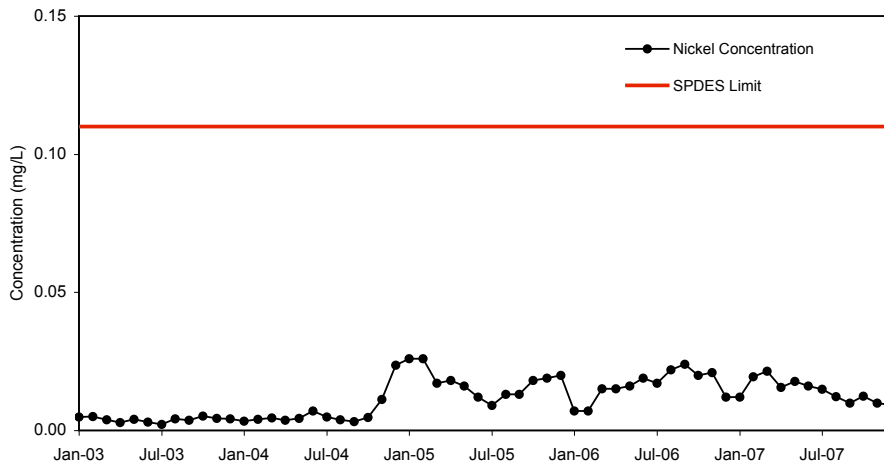


Figure 3-5. Maximum Concentrations of Nickel Discharged from the BNL Sewage Treatment Plant, 2003–2007.

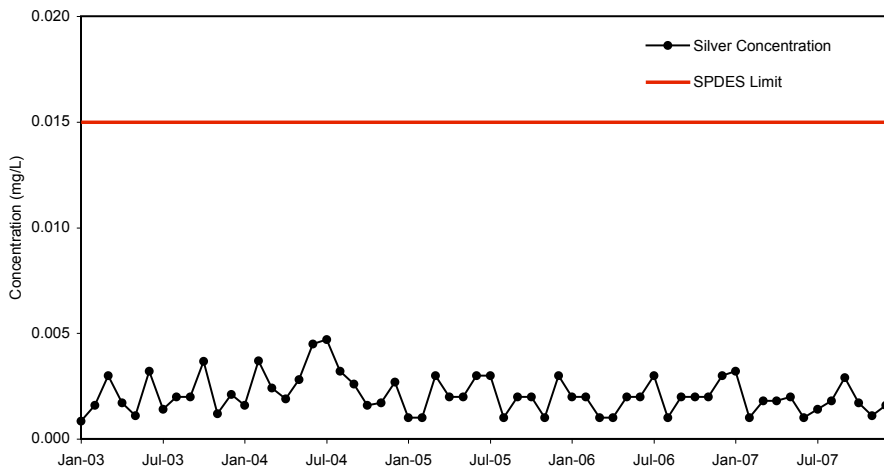
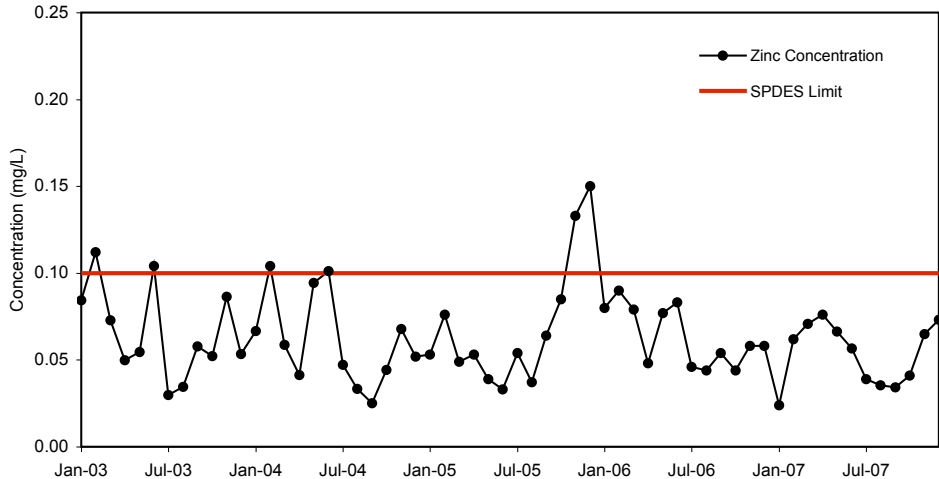


Figure 3-6. Maximum Concentrations of Silver Discharged from the BNL Sewage Treatment Plant, 2003–2007.

Note:
Per New York State Department of Environmental Conservation guidance, the concentrations of zinc exhibited in the effluent during February and June of 2003 and 2004 and November 2005 were 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, 2003–2007.



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. 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 2006 continued to be inconclusive to determine the toxic effects on freshwater organisms, testing was continued in 2007. Changes to the testing program in 2007 included using synthetic fresh water modified to the hardness of the Peconic River as a dilution water source. This change was necessitated by inconsistencies in water characteristics from the Water Treatment Plant. Tests were performed in March, June, September, and December. Minnows exhibited no acute or chronic toxicity in all tests conducted in 2007. For the water flea, minor impacts on reproduction rates were

observed in one of the four tests conducted (December). 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 2008.

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 2007. Review of the data shows that all discharges were in full compliance with SPDES requirements. No permit excursions were recorded at any of these outfalls in 2007.

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 (NYS-DOH) 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 Water Sampling and Analysis Plan (Chaloupka 2007) is prepared by BNL to comply with these requirements.

Table 3-4. Analytical Results for Wastewater Discharges to Outfalls 002, 005 – 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	10	9	NA	NA	NA
	Min.	0.006	0.08	0.02	0.003	0.08	0.008	0.001	NA	NA	NA
	Max.	1.1	0.096	0.58	0.11	0.57	3.3	0.27	NA	NA	NA
pH (SU)	Min.	6.2	6.3	6.7	6.4	6.6	7.1	6.4	NA	NA	NA
	Max.	8.0	8.2	8.4	8.4	8.4	7.9	7.5	8.5, 9.0 (a)	0	100
Oil and grease (mg/L)	N	12	12	12	12	NR	10	8	NA	NA	NA
	Min.	<0.88	<0.88	<0.88	<0.88	NR	<0.94	<1.01	NA	NA	100
	Max.	6.3	4.6	2.7	2.5	2.6	3.4	2.3	15	0	100
Copper (mg/L)	N	NR	5	NR	NR	NR	NR	3	NA	NA	NA
	Min.	NR	<0.003 (T)	NR	NR	NR	NR	<0.003 (D)	NA	0	100
	Max.	NR	0.012 (T)	NR	NR	NR	NR	0.0078 (D)	1.0	0	100
Aluminum (mg/L)	N	6	NR	NR	NR	NR	4	3	NA	NA	NA
	Min.	<0.07 (T)	NR	NR	NR	NR	<0.07 (D)	<0.07 (D)	NA	0	100
	Max.	0.24 (T)	NR	NR	NR	NR	0.19 (D)	0.2 (D)	2.0	0	100
Lead, Dissolved (mg/L)	N	NR	NR	NR	NR	NR	NR	3	NA	NA	NA
	Min.	NR	NR	NR	NR	NR	NR	0.001	NA	NA	NA
	Max.	NR	NR	NR	NR	NR	NR	0.002	0.05	0	100
Vanadium, Dissolved (mg/L)	N	NR	NR	NR	NR	NR	NR	3	NA	NA	NA
	Min.	NR	NR	NR	NR	NR	NR	0.006	NA	NA	NA
	Max.	NR	NR	NR	NR	NR	NR	0.007	NPL	NA	NA
Chloroform (µg/L)	N	5	NR	NR	NR	NR	NR	NR	NA	NA	NA
	Min.	<1.0	NR	NR	NR	NR	NR	NR	NA	0	100
	Max.	2.9	NR	NR	NR	NR	NR	NR	7	0	100
Bromo-dichloromethane (µg/L)	N	5	NR	NR	NR	NR	NR	NR	NA	NA	NA
	Min.	<1.0	NR	NR	NR	NR	NR	NR	NA	0	100
	Max.	1.6	NR	NR	NR	NR	NR	NR	5	0	100
1,1,1-trichloroethane (µg/L)	N	5	NR	NR	NR	NR	NR	NR	NA	NA	NA
	Min.	<1.0	NR	NR	NR	NR	NR	NR	NA	0	100
	Max.	0.65	NR	NR	NR	NR	NR	NR	5	0	100

(continued on next page)

Table 3-4. Analytical Results for Wastewater Discharges to Outfalls 002, 005 – 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*
1,1-dichloroethylene (µg/L)	N	NR	NR	NR	NR	NR	10	NR	NA	0	100
	Min.	NR	NR	NR	NR	NR	< 1.0	NR	NA	0	100
	Max.	NR	NR	NR	NR	NR	< 1.0	NR	5	0	100
Hydroxyethylidene-diphosphonic acid (mg/L)	N	4	4	4	4	NR	NR	NR	NA	0	100
	Min.	< 0.05	< 0.05	< 0.05	< 0.05	NR	NR	NR	NA	0	100
	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	NA	0	100
	Min.	< 0.005	< 0.005	< 0.005	< 0.005	NR	NR	NR	NA	0	100
	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

D = Dissolved

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

T = Total Recoverable

(a) pH limit is 8.5 for Outfalls 005, 008, and 010. pH limit is 9.0 for Outfalls 002, 002B, 006A, 006B, and 007.

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 2007. In 2007, only iron and color exceeded New York State Drinking Water Standards (NYS DWS), in samples collected from three of the wells (wells 4, 6 and 7) before distribution. Groundwater from these three 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 VOCs. At the point of consumption, drinking water complied with all DWS during 2007. Chapter 7 provides additional data on environmental surveillance tests performed on potable wells. This additional testing goes beyond the minimum SDWA testing requirements.

To ensure that BNL drinking-water consumers are informed about the quality of Laboratory-produced potable water, BNL annually publishes a Consumer Confidence Report (CCR) by the May deadline required by the SDWA. This report provides information regarding BNL's source water, supply system, the analytical tests conducted, and the detected contaminants as compared to federal drinking water standards. The CCR also describes the measures the Laboratory takes to protect its water source and limit consumer exposure to contaminants. The CCR is distributed as a special edition of the Laboratory's weekly newsletter to all BNL employees and on-site residents, and it is also available electronically at <http://www.bnl.gov/bnlweb/pubaf/water/reports.htm> and <http://www.bnl.gov/bnlweb/pubaf/bulletin.asp>.

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 require-

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
Water Quality Indicators								
Ammonia (mg/L)	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	SNS
Chlorides (mg/L)	39	22.8	25.6	17.2	17.3	27	30.3	250
Color (units)	20*	50*	30*	< 5	< 5	< 5	< 5	15
Conductivity (µmhos/cm)	210	196	248	139	298	283	175	SNS
Cyanide (µg/L)	< 10	< 10	< 10	< 10	< 10	< 10	< 10	SNS
MBAS (mg/L)	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	SNS
Nitrates (mg/L)	0.19	0.17	0.28	0.43	0.48	0.46	0.28	10
Nitrites (mg/L)	0.12	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	1.0
Odor (units)	0	0	0	0	0	0	0	3
pH (Standard Units)	5.4	5.4	5.5	5.7	5.7	6.0	6.9	SNS
Sulfates (mg/L)	9.5	9.9	10.6	6.5	9.4	9.5	11.1	250
Total coliform	ND	1	ND	ND	ND	ND	ND	Negative
Metals								
Antimony (µg/L)	< 5.90	< 5.90	< 5.90	< 5.90	< 5.90	< 5.90	< 5.90	6.0
Arsenic (µg/L)	< 3.00	< 3.00	< 3.00	< 3.00	< 3.00	< 3.00	< 3.00	50
Barium (mg/L)	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	2.0
Beryllium (µg/L)	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	4.0
Cadmium (µg/L)	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	5.0
Chromium (mg/L)	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	0.1
Fluoride (mg/L)	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	2.2
Iron (mg/L)	1.46*	3.33*	2.1*	0.03	0.02	0.02	0.1	0.3
Lead (µg/L)	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	15
Manganese (mg/L)	0.154	0.114	0.072	< 0.010	< 0.010	< 0.010	0.043	0.3
Mercury (µg/L)	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	2.0
Nickel (mg/L)	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	SNS
Selenium (µg/L)	< 5.00	< 5.00	< 5.00	< 5.00	< 5.00	< 5.00	< 5.00	50.0
Sodium (mg/L)	21.2	13.0	15.1	10.8	12.3	15.0	18.5	SNS
Silver (µg/L)	< 10	< 10	< 10	< 10	< 10	< 10	< 10	100
Thallium (µg/L)	< 1.90	< 1.90	< 1.90	< 1.90	< 1.90	< 1.90	< 1.90	2.0
Zinc (mg/L)	0.02	0.03	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	5.0
Radioactivity								
Gross alpha activity (pCi/L)	< 1.43	1.97 ± 1.24	< 1.97	< 0.98	2.37 ± 1.23	< 1.52	NR	15.0
Gross beta activity (pCi/L)	< 2.57	< 2.75	< 2.59	< 1.95	2.78 ± 1.07	2.99 ± 1.80	NR	(a)
Strontium-90 (pCi/L)	< 0.66	< 0.77	< 0.75	< 0.40	< 0.75	< 0.75	NR	8.0
Tritium (pCi/L)	< 370	< 370	< 370	< 370	< 370	< 370	NR	20,000

(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
Other								
Alkalinity (mg/L)	11.8	7.4	14.2	22.9	16.2	19.4	25.6	SNS
Asbestos (M. fibers/L)	NR	NR	NR	NR	NR	NR	< 0.20	7
Calcium (mg/L)	5.2	4.2	5.9	8.1	6.5	8.5	10.1	SNS
HAA5 (mg/L)	NR	NR	NR	NR	NR	NR	< 0.002	0.06**
Residual chlorine - MRDL (mg/L)	NR	NR	NR	NR	NR	NR	0.6	4.0
TTHM (mg/L)	NR	NR	NR	NR	NR	NR	0.01	0.08**

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. Gross beta activity does not identify specific radionuclides; therefore, a dose equivalent can not be calculated. No specific nuclides were detected; therefore, compliance with the requirement is demonstrated.

ments 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 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 188 cross-connection control units were tested at BNL in 2007, 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 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 protecting 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 the 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 2007, two new storm water drywells were installed for the local control of flooding, and six were closed in accordance with EPA and SCDHS requirements.

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 “authorized by rule” rather than by permit.

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	< MDL	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

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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							
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
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	5.6	3.7	23.4	1.5	1.4	1.6	0.5	50
Bromodichloromethane	4.8	< MDL	2.5	< MDL	0.6	< MDL	< MDL	50
Dibromochloromethane	5.5	< MDL	0.5	< 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	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	0.2
Heptachlor	NR	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	0.4
Aldrin	NR	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
Heptachlor Epoxide	NR	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	0.2
Dieldrin	NR	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
Endrin	NR	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	0.2
Methoxychlor	NR	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	40
Toxaphene	NR	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	3
Chlordane	NR	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	2
Total PCB's	NR	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	0.5
2,4,5,-TP (Silvex)	NR	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	10
Dinoseb	NR	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	50
Dalapon	NR	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	50

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

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							
Picloram	NR	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	50
Dicamba	NR	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	50
Pentachlorophenol	NR	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	1
Hexachlorocyclopentadiene	NR	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
Bis(2-ethylhexyl)Phthalate	NR	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	50
Bis(2-ethylhexyl)Adipate	NR	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	50
Hexachlorobenzene	NR	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
Benzo(A)Pyrene	NR	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	50
Aldicarb Sulfone	NR	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	SNS
Aldicarb Sulfoxide	NR	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	SNS
Aldicarb	NR	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	SNS
Oxamyl	NR	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	50
3-Hydroxycarbofuran	NR	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	50
Carbofuran	NR	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	40
Carbaryl	NR	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	50
Methomyl	NR	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	50
Glyphosate	NR	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	50
Diquat	NR	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	50
1,2-dibromoethane (EDB)	NR	< MDL	< MDL	< MDL	NA	< MDL	< MDL	0.05
1,2-dibromo-3-chloropropane	NR	< MDL	< MDL	< MDL	NA	< MDL	< MDL	0.2
2,4,-D	NR	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	50
Alachlor	NR	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	2
Simazine	NR	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	50
Atrazine	NR	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	3
Metolachlor	NR	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	50
Metribuzin	NR	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	50
Butachlor	NR	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	50
Endothall	NR	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	100
Propachlor	NR	< MDL	< 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

Under the “authorized by rule” requirements, a separate inventory is maintained for these treatment facilities and is 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 maintains 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 storage facility locations. The SPCC Plan is filed with NYSDEC, EPA, and DOE, and was updated in October 2007 (Chaloupka 2007). BNL remained in full compliance with the SPCC requirements in 2007.

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 October 2007,

BNL’s deadline for updating and implementing its SPCC plan was once again extended by EPA, this time to February 2009. Although the Laboratory has recently updated its SPCC Plan ahead of schedule, the plan will be reviewed again prior to the February 2009 deadline to ensure it complies with all SPCC requirements.

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 revised FRP was approved by EPA in September 2006. Updates to the plan were published in 2007 to ensure all telephone notification lists remained current.

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 2007 through the submittal of reports under EPCRA Sections 302, 303, 311, and 312. In 2007, through the Tier III report, BNL reported releases of lead (~ 16,483 pounds), mercury (~ 95 pounds), PCBs (~ 40 pounds), benzo(g,h,i)perylene (< 1 pound), and polycyclic aromatic compounds (< 1 pound). “Releases” of lead, PCBs, and mercury were

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 []

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 2007, there were no releases of “extremely hazardous substances” 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 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 affecting 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 2007, there were 21 spills, twelve of which met regulatory agency reporting criteria. The remaining nine 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 small volumes of ethylene glycol spilled from employee- or Laboratory-owned vehicles. Four releases were from hydraulic systems on BNL-owned and -operated equipment. In all cases, the releases were 5 gallons or less, but because they reached the soil they were reportable in New York State, which has a “zero tolerance” level for releases of pe-

troleum products to soil or water. There was one spill of hydraulic fluid from a non BNL-operated vehicle and a spill of waste motor oil that an employee had brought on-site for disposal at the public service station. Again, since these spills impacted soils they were reportable to the NYSDEC. There were two spills associated with elevator or hydraulic lift systems. The first spill was discovered when a vehicle lift began to malfunction at Building 423. The second spill occurred during replacement of the elevator lift system in Building 1005. 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. In addition, there were no environmental events reported through ORPS in 2007.

The Laboratory continues its successful reductions in the number and severity of spills on site. In 2007, the total number of spills was reduced by 22 percent, from 27 spills 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.

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 and is stored in six tanks ranging from 300,000 to 600,000 gallons. In March 2007, the Laboratory obtained a renewed license to operate the MPF. The license renewal was based on, among other factors, the history of spills and discharges, the history of compliance with the applicable provisions of 6 NYCRR Parts 613 and 614, review of submitted plans and inspections of the facility, and compliance with license conditions. During 2007, BNL remained in full

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

Spill No. and Date	Material and Quantity	ORPS Report	Source/Cause and Corrective Actions
07-02 02/07/07	Ethylene Glycol/ Water 1/2 gallon	No	A Laboratory vehicle leaked antifreeze onto the parking lot of Building 50. Speedy dry was used to absorb the fluid and the car was sent to the vehicle maintenance shop for repair. All wastes were containerized for off-site disposal.
07-03 04/20/07	Hydraulic Fluid 1 quart	No	While using a front-end loader to clear brush, a stump became wedged between the bucket and the ground, resulting in damage to a hydraulic hose. The loader was immediately secured and shut down. Impacted soils were removed and containerized for off-site disposal.
07-04 05/03/07	Hydraulic Fluid 1/2 cup	No	During retrieval of a roll-off trailer, a Town of Brookhaven vehicle spilled approximately 1/2 cup of hydraulic fluid to the ground. The spill was caused by an overfilled reservoir. The reservoir was drained to remove excess fluid, and the impacted soil was removed for off-site disposal.
07-05 05/17/07	Hydraulic Fluid 2 gallons	No	While mowing the lawn outside of Building 750, the lawn mower developed a leak from the valve spool. Examination of the valve spool showed that one of the hose fittings loosened due to vibration. The hose connection was repaired, and the impacted soils were excavated and containerized for off-site disposal.
07-06 05/18/07	Biobased Hydraulic Fluid 25 gallons	No	During examination of the vehicle lifts in Building 423, vehicle lift 2 was noted as not operating properly. Further examination by the repair contractor revealed a leak in the buried piping, and the piping was then repaired. The hydraulic fluid was vegetable oil-based; therefore, the New York State Department of Environmental Conservation did not require the remediation of the impacted soils.
07-07 06/03/07	Ethylene Glycol/ Water 1 gallon	No	A privately operated limousine developed an antifreeze leak due to a failed water pump. The vehicle was towed from the BNL site for repair, and the spilled fluid was absorbed with speedy dry and containerized for off-site disposal.
07-08 06/06/07	Waste Engine Oil 3 gallons	No	A BNL employee brought a container of waste oil from home to dispose of at the local service station. The container was transferred from his personal vehicle to a laboratory pick-up truck. The container was not secured in the back of the truck, and it fell over and split open. The oil spilled into the back of the truck, out of the rear door, and onto pavement and soil. Speedy dry and sand were used to absorb the spilled oil. All contaminated media was collected and containerized for off-site disposal.
07-11 08/07/07	Ethylene Glycol/ Water 1/2 gallon	No	The water pump in a BNL-operated vehicle failed, resulting in a release of antifreeze to the parking lot of Building 423. The vehicle was awaiting repair at the time of release. Speedy dry was used to remediate the release, which was later collected and containerized for off-site disposal.
07-13 08/29/07	Ethylene Glycol/ Water 1/2 gallon	No	The lower radiator hose of a Laboratory vehicle failed, resulting in a release of antifreeze to the parking lot at Building 599. Speedy dry was used to absorb the spilled fluid, which was later collected for off-site disposal. The vehicle was sent to the vehicle maintenance shop for repair.
07-15 09/19/07	Hydraulic Fluid 30 gallons	No	During replacement of the elevator hydraulic system in Building 1005, a release of hydraulic fluid was discovered. The fluid was found in the interstitial space of the hydraulic cylinder and the exterior casing. The elevator casing was partially submerged in groundwater and the oil was found floating on the surface of the water. All oil was contained between the outside casing and the water. The oil was removed by pumping and by flooding the casing with water, causing the oil to spill out the top where it was collected. All oil and contaminated water was containerized for off-site disposal. The new hydraulic system includes a secondary containment sock to prevent future releases in the event of a casing leak.
07-17 10/22/07	Hydraulic Fluid 5 gallons	No	A new front-end loader leaked oil on the ground during its initial use. Examination of the unit showed that the hose connections at the control box were loose, probably due to vibration during shipping. The contaminated soils were containerized for off-site disposal.
07-19 12/10/07	Hydraulic Fluid 1 gallon	No	A hydraulic hose on the garbage truck failed resulting in a release of hydraulic oil to parking areas near Buildings 488 and 902. Due to wet weather, the oil flowed into a storm water catch basin and was discharged to a low-lying area near Building 904. The spill was remediated by using spill absorbents. All contaminated media was collected and containerized for off-site disposal.

Note:

* Release is reportable to DOE under the requirements of DOE Order 231.1A, Occurrence Reporting and Processing.

compliance with the MPF license requirements, which include monitoring groundwater in the vicinity of the six active, aboveground storage tanks. The license also requires BNL to inspect

the storage facilities monthly and test the tank leak detection systems, 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 2007, 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 2007, engineering plans were prepared for the complete upgrade of the secondary containment basin for tanks 5 and 6 and were submitted to NYSDEC for approval. As part of the upgrade work, the tanks were emptied, all related piping and supports were removed, and the cathodic protection system for the tanks was temporarily de-energized to facilitate replacement of the containment system. The approved plans will be implemented in 2008.

In November, NYSDEC conducted its annual inspection of the Major Oil Storage Facility. Three conditions that required corrective action were identified: the submittal of design specifications/plans for the replacement of the secondary containment system for tanks 5 and 6, repair of a malfunctioning alarm system located at the steam plant truck off-loading area, and the need for an additional cover stone on several of the secondary containment systems to prevent liner damage. In addition, an inspection of the Laboratory's diesel tank farm and underground gasoline storage facilities identified three conditions that required corrective action. They included reapplication of the proper color coding for an underground storage tank containing #2 fuel oil, inspection and repair of two high-level alarms at the diesel tank farm that failed to function properly during manual activation, and noting both the design and working capacities of each tank at the diesel tank farm. All conditions were corrected in accordance with NYSDEC directives prior to the end of calendar year 2007.

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 chemi-

cals 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 November 2007. During this inspection, two issues were identified that required corrective action: peeling and blistering paint observed on the west end plate of Tank 637-01 located in Potable Well House #12, and tank labels that did not include the working capacity of each tank. The issues were corrected in accordance with the NYSDEC directive.

3.8.6 County Storage Requirements

Article 12 of the Suffolk County Sanitary Code 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 Laboratory 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 348 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 37 storage facilities are temporarily out of service. The Laboratory has two 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 2007, the Laboratory continued to provide SCDHS with updated information regarding several registered tanks, including the results of annual cathodic protection testing and a request to abandon the Building 801 D and F tanks, which was approved by SCDHS. In addition, design plans and specifications for two new diesel generator tank systems at Buildings 515 and 912A were prepared and submitted to SCDHS for approval. Both systems were designed to fully conform to SCSC Article 12 requirements for aboveground storage.

In October 2007, a representative from SCDHS conducted an inspection of the Laboratory's underground storage tanks at the motor pool, which services the site's government vehicle fleet, and at Upton Industries, a full-service gas station and car repair garage. The purpose of this inspection was routine surveillance of registered storage facilities to verify compliance with SCSC Article 12 requirements. Some deficiencies and other concerns that required corrective action were observed during the inspections. These deficiencies included a malfunctioning leak detection sensor in two piping fill/sumps, two high-level alarms that could not be demonstrated when manually activated, insufficient seals on three tank interstitial space probe risers/caps, and deficiencies in inspection records and scheduled repairs. All deficiencies identified were addressed to Suffolk County's satisfaction, including the development of a procedure and training of personnel on the appropriate management and inspection of underground storage tank systems.

3.9 RCRA REQUIREMENTS

The Resource Conservation and Recovery Act 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. Because the Laboratory may generate greater than 1,000 Kg (2,200 pounds) of hazardous waste in a month, it is considered a large-quantity generator 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 Substance and Control Act. 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 2007.

The Laboratory has aggressively approached reductions in its PCB inventory. By replacing and disposing of 55 large capacitors from the Collider-Accelerator Department in 2007, the inventory was reduced an additional 44 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. 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 2007.

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 Manage-

ment 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 2007, two projects were granted permits under this program. These projects included the installation of air conditioning for instrument houses at multiple locations at the Relativistic Heavy Ion Collider (RHIC), and the construction of a block house at the 4 o’clock area at RHIC. Final photos for a recharge basin built under an earlier permit were submitted in 2007, along with the permit completion notice to close the 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 occurs 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. Radio telemetry work on the eastern box turtle was completed in the summers of 2006 and 2007 at one of the many ponds at BNL in order to assess the amount of territory overlap in this species. This was completed to assess the potential for disease transmission between individuals of this species. 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-leafed 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 NMRP, locations of these rare plants must be determined, populations estimated, and management requirements established. In an effort to locate and document rare plants, BNL is working with a botanist to assess the flora found at BNL. 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 addition to ex-

ternal audits and oversight, the Laboratory has a comprehensive self-assessment program, as described in Chapter 2. In 2007, 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. These inspections included:

- *Air Compliance.* NYSDEC inspected the Laboratory in September 2007 to verify compliance with permit requirements. This inspection focused on operations at the CSF. No compliance issues were identified.
- *Potable Water.* In July, SCDHS collected 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 2007, no performance or operational issues were identified. In November, NYSDEC also inspected 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 November. See Section 3.8.4 for a discussion of the issues identified.
- *Chemical Bulk Storage Facilities.* The CBS facilities are inspected periodically by NYSDEC. The inspection was conducted in November (see Section 3.8.5).
- *Hazardous Waste.* NYSDEC did not perform its annual review of the BNL Hazardous Waste Program.

3.14.2 DOE Assessments/Inspections

In 2007, BNL underwent several reviews by DOE, most notably an assessment of the BNL Integrated Safety Management System by the Headquarters office. During July and August 2007, the DOE Office of Environment, Safety and Health (ES&H) evaluations (HS-64), within the Office of Health, Safety and Security (HSS), inspected ES&H program implementation at

BNL. The inspection team concluded in their report, "Inspection of ES&H Programs at BNL" (HSS Report), that significant improvement was evident in all areas reviewed since the 2000 ES&H inspection. However, further work is needed in core functions (CF) 3 – Develop and Implement Hazard Controls, CF 4 – Perform Work within Controls, and CF 5 – Feedback and Improvement. The HSS Report identified nine site-specific findings. BSA/BNL has responsibility for developing corrective actions for seven of the findings and the DOE-Brookhaven Site Office (BHSO) has responsibility for two findings. The Laboratory has prepared a comprehensive Corrective Action Plan (CAP) to address the findings identified from the HSS inspection. The HSS Report also identified 18 opportunities for improvement. Many of these were incorporated as part of the corrective actions outlined in this ES&H corrective action plan.

Beyond the findings, opportunities for improvement, and analysis of ongoing corrective action plans, the Laboratory reviewed the Validation Appendices attached to the HSS Report, to identify unmitigated hazards or situations that present an unacceptable immediate risk to workers, public health, or the environment. In all, 17 compensatory actions were identified to address unmitigated hazards.

Given the Laboratory's past success in using an integrated project approach to safety improvement, the ES&H CAP was incorporated into the Integrated Safety Management (ISM)/ Safety Improvement Project with a specific Work Breakdown Structure (WBS) designation, and managed as a part of the overall project. The ES&H CAP portion of the project WBS will be updated as corrective actions are completed and tracked to closure in the BNL Assessment Tracking System (ATS) as Assessment No. 4015.

In September 2007, the DOE Chicago Support Center, in coordination with the BHSO, reviewed the BNL Hazardous Waste Management Program. One specific issue and two general issues were identified during this review and required corrective action: 1) when a release of oil was discovered during the replacement of an elevator hydraulic system in Building 1005, the

Table 3-8. Existing Agreements and Enforcement Actions Issued to BNL, with Status.

Number Agreements	Title	Parties	Effective Date	Status
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 to the environmental and technical requirements of Suffolk County codes.
No Number	Federal Facilities Compliance Agreement on Mixed Wastes	NYSDEC 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). While all clean-up actions were completed in 2005, BNL continues to perform surveillance and maintenance of operating remediation systems. All systems operated as required in 2007.

Notices of Violation/Enforcement Actions

None

Notes:

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

change in conditions should have been noted on the work permit; 2) inspection reports did not document instances when no concerns were found during an inspection; and 3) BNL does not document the “all’s clear” condition when conducting inspections of work spaces. A Corrective Action Plan was prepared to address these conditions and is being implemented.

The DOE BHSO also continued to oversee Laboratory programs and observed BNL’s multi-topic programmatic assessment. In 2007, the Environmental and Waste Management Services Division (EWMSD) simplified its assessment, conducting a review of issues identified during regulatory inspections and the required self-assessments (e.g., annual certifications), and performing a review of tank inspection records. The rationale for this means of assessing BNL organizations was to reduce the impact, in time and resources, on both the assessors and those being assessed. In addition, the Laboratory also underwent its annual Nevada Test Site (NTS) inspection in order to maintain its waste

shipment certification. The results of these assessments and the inspection are summarized below. In addition to the formal assessments, BHSO staff perform routine surveillance assessments of BNL operations to ensure that work is conducted in accordance with regulatory requirements.

3.14.2.1 Environmental Multi-Topic Assessment

In 2007, the EWMSD conducted an assessment of compliance activities associated with liquid effluents, radiological and nonradiological air emissions, and the storage of hazardous and nonhazardous materials. However, in lieu of performing a new assessment, routine inspections and reports were reviewed. Annually, the Laboratory undergoes a minimum of 10 regulatory compliance inspections and performs numerous self-evaluations of operations to ensure compliance with regulatory requirements. These inspections and self-evaluations include:

- Annual and semi-annual certifications of air emission requirements

- Annual NESHAPs evaluation and preparation of the annual NESHAPs report
- Annual internal review of major oil storage and chemical bulk storage facilities
- Quarterly inspections of the STP by SCDHS
- Annual NYSDEC and SCDHS inspections of waste water discharges permitted under the SPDES
- Annual NYSDEC inspections of chemical bulk storage (as defined by 6 NYCRR Part 596) and the major oil storage facilities
- Annual NYSDEC air emissions inspections
- Annual NYSDEC inspections of hazardous waste operations for RCRA compliance
- Annual SCDHS potable water inspections

In addition to the activities identified above, in 2007 the Laboratory was requested by NYSDEC to conduct a comprehensive review and sampling of all waste water discharges permitted under the SPDES permit. Based on the findings of these inspections or data gaps not covered during these reviews, supplemental reviews were also conducted of wastewater discharges contributing to Outfall 006B, mercury-bearing wastewater streams, and tank inspection records. All Laboratory organizations were reviewed during this assessment in one or more categories. Three nonconformances, 13 “observations,” and four opportunities for improvement were identified through this assessment. Corrective actions for all nonconformances and observations were developed and are being tracked through the Laboratory’s Assessment Tracking System.

3.14.2.2 Nevada Test Site Inspection

As part of the NTS waste certification process, random unannounced inspections by the NTS Maintenance and Operations Contractor are conducted. In September 2007, BNL’s Waste Management Program was inspected to assess its waste shipments to NTS. One corrective action

was issued. The issue was corrected, and BNL continues to be a certified NTS waste generator.

3.15 ENFORCEMENT ACTIONS AND AGREEMENTS

No consent orders were issued to the Laboratory in 2007. All former enforcement actions have been closed. 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. All regulatory agreements are listed in Table 3-8, along with a summary of their status.

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