Acronyms and Technical Terms

AGC	Annual Guideline Concentrations
AGS	Alternating Gradient Synchrotron
ALARA	As Low As Reasonably Achievable
amu	Atomic Mass Unit
ANSI	American National Standards Institute
AOC	Area of Concern
ASL	Analytical Services Laboratory
AS/SVE	Air Sparging/Soil Vapor Extraction
AWQS	Ambient Water Quality Standards
BGRR	Brookhaven Graphite Research Reactor
BLIP	Brookhaven Linac Isotope Producer
BMRR	Brookhaven Medical Research Reactor
BNL	Brookhaven National Laboratory
BOD_5	Biological Oxygen Demand
BSA	Brookhaven Science Associates
BTEX	benzene, toluene, ethylbenzene, and xylene
CA	Collider Accelerator
CAA	Clean Air Act
CASIM	Cascade Simulation
CCWP	Central Chilled Water Plant
CEM	Continuous Emissions Monitoring
CERCLA	Comprehensive Environmental Response, Compensation & Liability Act
CFR	U.S. Code of Federal Regulations
Ci	Curie
CO_2	carbon dioxide
COC	Chain-of-custody
CSF	Central Steam Facility
CWA	Clean Water Act
CY	calendar year
D_2O	deuterium; heavy water
DCA	1,1-dichloroethane
DCE	1,1-dichloroethylene
DCG	Derived Concentration Guide
DMR	Discharge Monitoring Report
DOE	U.S. Department of Energy
DOELAP	Department of Energy Laboratory Accreditation Program
DQO	Data Quality Objective
DWS	Drinking Water Standards
EDB	ethylene dibromide
EDE	Effective Dose Equivalent
EIMS	Environmental Information Management System

ELAP	Environmental Laboratory Approval System
EM	Environmental Monitoring
EML	Environment Measurements Laboratory
EMP	Environmental Monitoring Plan
EMS	Environmental Management System
ER	Environmental Restoration
ERD	Environmental Restoration Division
EPA	Environmental Protection Agency
ES	Environmental Surveillance
EWMSD	Environmental and Waste Management Services Division
FERN	Foundation for Ecological Research in the Northeast
FFA	Federal Facilities Agreement
FFCA	Federal Facilities Compliance Act
FY	fiscal year
FWS	U.S. Fish and Wildlife Service
GAB	gross alpha and beta
GAC	Granulated Activated Carbon
GC/ECD	Gas Chromatography/Electron Capture Detector
GC/MS	Gas Chromatography/Mass Spectrometry
GEL	General Engineering Laboratory (contracted)
GIS	Geographic Information System
GMR	Groundwater Monitoring Report
HAA5	Five Haloacetic Acids
H2M	a contracted analytical laboratory
HAP	Hazardous Air Pollutant
HEDP	hydroxyethilydene diphosphoric acid
HEPA	High Efficiency Particulate Air
HFBR	High Flux Beam Reactor
HITL	Heavy Ion Transfer Line
HTO	tritiated water (liquid or vapor)
HWMF	Hazardous Waste Management Facility (former)
IAG	Interagency Agreement
IC	Ion-Chromatrography
ICP/MS	Inductively Coupled Plasma/Mass Spectrometry
ISO	International Organization for Standardization
LAMR	Landfill Annual Monitoring Report
LED	Light Emitting Diode
LIE	Long Island Expressway
LINAC	Linear Accelerator
MCL	Maximum Contaminant Level
MDL	Minimum Detection Limit
MEI	Maximally Exposed Individual
MeV	million electron volts
MGD	million gallons per day
MH	manhole
MOA	Memorandum of Agreement

MPF	Major Petroleum Facility
MRC	Medical Research Center
mrem	millirem
MTBE	methyl tertiary butyl ether
MW	megawatt
NAAQS	National Ambient Air Quality Standards
ND	Not Detected or No Dose
NEPA	National Environmental Policy Act
NESHAPs	National Emission Standards for Hazardous Air Pollutants
NIST	National Institute for Standards and Technology
NO_2	nitrogen dioxide
NOx	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
NSLS	National Synchrotron Light Source
NSLS-II	National Synchrotron Light Source-II
NYCRR	New York Codes, Rules, and Regulations
NYS	New York State
NYSAWQS	New York State Ambient Water Quality Standard
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
NYSDWS	New York State Drinking Water Standard
O&M	Operation and Maintenance
ORPS	Occurrence Reporting and Processing System
OU	Operable Unit
PE	Plant Engineering
PCB	polychlorinated biphenyl
PCE	tetrachloroethylene
PNNL	Pacific Northwest National Laboratory
ppb	parts per billion
ppm	parts per million
PPGMBE	polypropylene glycol monobutyl ether
QA	Quality Assurance
QA/QC	Quality Assurance/Quality Control
QAP	Quality Assurance Program
QAPP	Quality Assurance Program Plan
QC	Quality Control
QES	Quarterly Emission Statement
QM	Quality Management
RA	Removal Action
RACT	Reasonably Achievable Control Technology
RCRA	Resource Conservation and Recovery Act
RESRAD	Residual Radioactive Material
RHIC	Relativistic Heavy Ion Collider
RI/FS	Remedial Investigations/Feasibility Study
ROD	Record of Decision
RTF	Radiation Therapy Facility

SARA	Superfund Amendments and Reauthorization Act
SCDHS	Suffolk County Department of Health Services
SDWA	Safe Drinking Water Act
SER	Site Environmental Report
SME	subject matter expert
SOC	synthetic organic compound
SOP	Standard Operating Procedure
SO_2	sulfur dioxide
SPCC	Spill Prevention Control and Countermeasures
SPDES	State Pollutant Discharge Elimination System
SPING	Sampler, Particulate, Iodine, and Noble Gas
STEM	Scanning Transmission Electron Microscope
STL	Severn Trent Laboratories (contracted)
STP	Sewage Treatment Plant
SVOC	semivolatile organic compound
$t_{1/2}$	half-life
TAL	Target Analyte List
TCA	1,1,1-trichloroethane
TCE	trichloroethylene
TEDA	triethylene diamamine
THMs	Trihalomethanes
TLD	thermoluminescent dosimeter
TOC	total organic carbon
TSCA	Toxic Substances Control Act
TSDF	Treatment, Storage, and Disposal Facility
TSS	total suspended solids
TTA	tolytriazole
TVOC	total volatile organic compounds
UIC	Underground Injection Control
USC	United States Code
UST	underground storage tank
VOC	volatile organic compound
VUV	vacuum ultraviolet
WAC	Waste Acceptance Criteria
WCF	Waste Concentration Facility
WMF	Waste Management Facility
WQ	water quality
WSRRSA	Wild, Scenic, and Recreational River Systems Act
WTP	Water Treatment Plant

The following definitions reflect the typical manner in which the terms are used for this specific document and may not apply to all situations.

A

accuracy - The degree of agreement of a measurement with an accepted reference or true value. It is expressed as the difference between two values, as a percentage of the reference or true value, or as a ratio of the measured value and the reference or true value.

activation - The process of making a material radioactive by bombardment with neutrons, protons, or other high energy particles.

activation products - A material that has become radioactive through the process of activation.

activity - Synonym for radioactivity.

Administrative Record - A collection of documents established in compliance with Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) program. Consists of information upon which the CERCLA lead agency bases its decision on the selection of response actions. The Administrative Record file should be established at or near the facility and made available to the public. An Administrative Record can also be the record for any enforcement case.

aerosol - A gaseous suspension of very small particles of liquid or solid.

air sparging - A method of extracting volatile organic compounds from the groundwater *in situ* (i.e., in place) using compressed air. The vapors are typically collected using a soil vapor extraction system.

air stripping - A process whereby volatile organic chemicals are removed from contaminated water by forcing a stream of air through the water in a vessel. The contaminants are evaporated into the air stream. The air may be further treated before it is released into the atmosphere.

ALARA - As Low As Reasonably Achievable, a phrase that describes an approach to minimize exposures to individuals and minimize releases of radioactive or other harmful material to the environment to levels as low as social, technical, economic, practical, and public policy considerations will permit. ALARA is not a dose limit, but a process with a goal to keep dose levels as far below applicable limits as is practicable.

alpha radiation - The emission of alpha particles during radioactive decay. Alpha particles are identical in makeup to the nucleus of a helium atom and have a positive charge. Alpha radiation is easily stopped by materials as thin as a sheet of paper and has a range in air of only an inch or so. Despite its low penetration ability, alpha radiation is densely ionizing and therefore very damaging when ingested or inhaled. Naturally occurring radioactive elements such as radon emit alpha radiation.

ambient air - The surrounding atmosphere, usually the outside air, as it exists around people, animals, plants, and structures. It does not include the air immediately adjacent to emission sources.

analyte - A constituent that is being analyzed.

anion - A negatively charged ion, often written as a negative sign after an element symbol, such as Cl–.

anthropogenic radionuclides - Radionuclides produced as a result of human activity (i.e., human-made).
aquifer - A water saturated layer of rock or soil below the ground surface that can supply usable quantities of groundwater to wells and springs. Aquifers can be a source of water for domestic, agricultural, and industrial uses.

area of concern (AOC) - Under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), this term refers to an area where releases of hazardous substances may have occurred or a location where there has been a release or threat of a release into the environment of a hazardous substance, pollutant, or contaminant (including radionuclides). AOCs may include, but need not be limited to, former spill areas, landfills, surface impoundments, waste piles, land treatment units, transfer stations, wastewater treatment units, incinerators, container storage areas, scrap yards, cesspools, tanks, and associated piping that are known to have caused a release into the environment or whose integrity has not been verified.

atomic absorption (AA) - A method used to determine the elemental spectroscopy composition of a sample. In this method, the sample is vaporized and the amount of light it absorbs is measured.

B

background – a sample or location used as reference or control to compare BNL analytical results to those in areas that could not have been impacted by BNL operations.

background radiation - Radiation present in the environment as a result of naturally occurring radioactive materials, cosmic radiation, or human-made radiation sources, including fallout.

becquerel (Bq) - A quantitative measure of radioactivity. This is an alternate measure of activity used internationally and with increasing frequency in the United States. One Bq of activity is equal to one nuclear decay per second. All references to quantities of radioactive material in this report are made in curies, followed in parentheses by the equivalent in Bq.

beta radiation - Beta radiation is composed of charged particles emitted from a nucleus during radioactive decay, with a mass equal to 1/1837 that of a proton. A negatively charged beta particle is identical to an electron. A positively charged beta particle is called a positron. Beta radiation is slightly more penetrating than alpha, but may be stopped by materials such as aluminum or Lucite panels. Naturally occurring radioactive elements such as potassium-40 emit beta radiation.

biochemical oxygen demand (BOD) - A measure of the amount of oxygen in biological processes that breaks down organic matter in water; a measure of the organic pollutant load. It is used as an indicator of water quality.

blank - A sample (usually reagent grade water) in the same type of container used for quality control of field sampling methods, to demonstrate that cross contamination has not occurred.

blowdown - Water discharged from either a boiler or cooling tower in order to prevent the build-up of inorganic matter within the boiler or tower and to prevent scale formation (i.e., corrosion).

C

cap - A layer of material, such as clay or a synthetic material (like Gunite™), used to prevent rainwater from penetrating and spreading contaminated materials. The surface of the cap is generally mounded or sloped so water will drain off.

carbon adsorption/carbon treatment - A treatment system in which contaminants are removed from groundwater, surface water, and air by forcing water or air through tanks containing activated carbon (a specially treated material that attracts and holds or retains contaminants).

carbon tetrachloride – A poisonous, nonflammable, colorless liquid, CCl_4.

chain-of-custody - A method for documenting the history and possession of a sample from the time of collection, through analysis and data reporting, to its final disposition.

characterization - Facility or site sampling, monitoring and analysis activities to determine the extent and nature of contamination. Characterization provides the basis of necessary technical information to select an appropriate cleanup alternative.

Class GA groundwater - New York State Department of Environmental Conservation classification for high quality groundwater, where the best intended use is as a source of potable water.

closure - Under the Resource Conservation and Recovery Act (RCRA) regulations, this term refers to a hazardous or solid waste management unit that is no longer operating and where potential hazards that it posed have been addressed (through clean up, immobilization, capping, etc.) to the satisfaction of the regulatory agency.

Code of Federal Regulations (CFR) - A codification of all regulations developed and finalized by federal agencies in the Federal Register.

collective effective dose equivalent - A measure of health risk to a population exposed to radiation. It is the sum of the effective dose equivalents of all individuals within an exposed population, frequently considered to be within 50 miles (80 kilometers) of an environmental release point. It is expressed in person-rem or person-sievert.

committed effective dose equivalent - The total Effective Dose Equivalent received over a 50-year period following the internal deposition of a radionuclide. It is expressed in rem or sieverts.

composite sample - A sample of an environmental media that contains a certain number of sample portions collected over a period of time. The samples may be collected from the same location or different locations. They may or may not be collected at equal time intervals over a predefined period of time (e.g., 24 hours).

confidence interval - A numerical range within which the true value of a measurement or calculated value lies. In this report, radiological values are shown with a 95% confidence interval, i.e., there is a 95 percent probability that the true value of a measurement or calculated value lies within the specified range.

contamination - Unwanted radioactive and/or hazardous material that is dispersed on or in equipment, structures, objects, air, soil, or water.

control - See background.

cooling water - Water that is used to cool machinery and equipment. Contact cooling water is any wastewater that contacts machinery or equipment to remove heat from the metal. Non-contact cooling water is water used for cooling purposes but has no direct contact with any process material or final product. Process wastewater cooling water is water used for cooling purposes that may have become contaminated through contact with process raw materials or final products.

curie (Ci) - A quantitative measure of radioactivity. One Ci of activity is equal to 3.7 x 10^{10} decays per second.

D

decay product - A nuclide resulting from the radioactive disintegration of a radionuclide, being formed either directly or as a result of successive transformations in a radioactive series. A decay product may be either radioactive or stable.

decontamination - The removal or reduction of radioactive or hazardous contamination from facilities, equipment, or soils by washing, heating, chemical or electrochemical action, mechanical cleaning, or other techniques to achieve a stated objective or end condition.

Department of Energy (DOE) - The federal agency that sponsors energy research and regulates nuclear materials used for weapons production. DOE has responsibility for the national laboratories and the science and research conducted at these laboratories, including BNL.

derived concentration guide (DCG) - The concentration of a radionuclide in air or water that, under conditions of continuous exposure for one year by a single pathway (e.g., air inhalation/immersion, water ingestion), would result in an effective dose equivalent of 100 mrem (1 mSv). The values have been established by DOE in Order 5400.5, *Radiation Protection of the Public and the Environment*. 1990, change 2, 1/7/93.

disposal - Final placement or destruction of waste.

dosimeter - A portable detection device for measuring the total accumulated exposure to ionizing radiation.

downgradient - In the direction of groundwater flow from a designated area; analogous to "downstream."

E

effective dose equivalent (EDE) - A value used to express the health risk from radiation exposure to a tissue or tissues in terms of an equivalent whole body exposure. It is a normalized value that allows the risk from radiation exposure received by a specific organ or part of the body to be compared with the risk due to whole body exposure. It is equal to the sum of the doses to different organs of the body multiplied by their respective weighting factors. It includes the sum of the effective dose equivalent due to radiation from sources external to the body and the committed effective dose equivalent due to the internal deposition of radionuclides. EDE is expressed in units of rem or sieverts.

effluent - Any liquid discharged to the environment, including stormwater runoff at a site or facility.

emission - Any gaseous or particulate matter discharged to the atmosphere.

environment - Surroundings in which an organization operates (including air, water, land, natural resources, flora, fauna, and humans) and their interrelation.

environmental aspect - Elements of an organization's activities, products, or services that can interact with the environment.

Environmental Assessment (EA) - A report that identifies potentially significant environmental impacts from any federally approved or funded project that may change the physical environment. If an EA identifies a "significant" impact (as defined by the National Environmental Policy Act [NEPA]), an Environmental Impact Statement is required.

environmental impact - Any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organization's activities, products, or services.

environmental media - Includes air, groundwater, surface water, soil, flora and fauna.

environmental monitoring or surveillance - Sampling for contaminants in air, water, sediments, soils, food stuffs, plants, and animals, either by directly measuring or by collecting and analyzing samples.

Environmental Protection Agency (EPA) - The federal agency responsible for developing and enforcing environmental laws. Although state regulatory agencies may be authorized to administer environmental regulatory programs, EPA generally retains oversight authority.

ethylene dibromide (EDB) - A colorless, nonflammable, heavy liquid with a sweet odor; slightly soluble in water, soluble in ethanol, ether, and most organic solvents. It was used as an additive in leaded gasoline, as a soil and grain fumigant, and in waterproofing preparations. It is still used to treat felled logs for bark beetles; to control wax moths in beehives; as a chemical intermediary for dyes, resins, waxes, and gums; to spot-treat milling machinery; and to control Japanese beetles in ornamental plants. The U.S. Department of Health and Human Services has determined that ethylene dibromide may reasonably be anticipated to be a carcinogen.

Environmental Protection Agency (EPA) - The federal agency responsible for developing and enforcing environmental laws. Although state regulatory agencies may be authorized to administer environmental regulatory programs, the EPA retains oversight authority.

evapotranspiration - A process by which water is transferred from the soil to the air by plants that take the water up through their roots and release it through their leaves and other aboveground tissue.

exposure - A measure of the amount of ionization produced by x-rays or gamma rays as they travel through air. The unit of radiation exposure is the roentgen (R).

F

fallout - Radioactive material made airborne as a result of aboveground nuclear weapons testing that has been deposited on the Earth's surface.

feasibility study (FS) - A process for developing and evaluating remedial actions using data gathered during the remedial investigation. The FS defines the objectives of the remedial program for the site and broadly develops remedial action alternatives, performs an initial screening of these alternatives, and performs a detailed analysis of a limited number of alternatives that remain after the initial screening stage.

G

gamma radiation - Gamma radiation is a form of electromagnetic radiation, like radio waves or visible light, but with a much shorter wavelength. It is more penetrating than alpha or beta radiation, capable of passing through dense materials such as concrete.

gamma spectroscopy - This analysis technique identifies specific radionuclides. It measures the particular energy of a radionuclide's gamma radiation emissions. The energy of these emissions is unique for each nuclide, acting as a "fingerprint" to identify a specific nuclide.

grab sample - A single sample collected at one time and place.

groundwater - Water found beneath the surface of the ground (subsurface water). Groundwater usually refers to a zone of complete water saturation containing no air.

Gunite™ - A mixture of cement, sand, and water sprayed on a metal mold.

H

half-life ($t_{1/2}$) - The time required for one half of the atoms of any given amount of a radioactive substance to disintegrate; the time required for the activity of a radioactive sample to be reduced by one half.

hazardous waste - Toxic, corrosive, reactive, or ignitable materials that can negatively affect human health or damage the environment. It can be liquid, solid, or sludge, and include heavy metals, organic solvents, reactive compounds, and corrosive materials. It is defined and regulated by the Resource Conservation and Recovery Act (RCRA), Subtitle C.

heat input - The heat derived from combustion of fuel in a steam generating unit. It does not include the heat from preheated combustion air, recirculated flue gases, or the exhaust from other sources.

heavy water (D_2O) - A form of water containing deuterium, a nonradioactive isotope of hydrogen.

hot cell - Shielded and air controlled facility for the remote handling of radioactive material.

hydrology - The science dealing with the properties, distribution, and circulation of natural water systems.

I

inert - Lacking chemical or biological action.

influent - Liquid (e.g., wastewater) flowing into a reservoir, basin, or treatment plant.

intermittent river - A stream that dries up on occasion, usually as a result of seasonal factors or decreased contribution from other sources (e.g., a sewage treatment plant).

ionizing radiation - Any radiation capable of displacing electrons from atoms or molecules, thereby producing ions. Some examples are alpha, beta, gamma, x-rays, neutrons, and light. High doses of ionizing radiation may produce severe skin or tissue damage.

isotope - Two or more forms of a chemical element having the same number of protons in the nucleus (or the same atomic number), but having different numbers of neutrons in the nucleus (or different atomic weights). Isotopes of a single element possess almost identical chemical properties.

L

leaching - The process by which soluble chemical components are dissolved and carried through soil by water or some other percolating liquid.

light water – Tap water.

liquid scintillation counter - An analytical instrument used to quantify tritium, carbon-14, and other beta-emitting radionuclides.

M

maximally exposed individual (MEI) - The hypothetical individual whose location and habits tend to maximize his/her radiation dose, resulting in a dose higher than that received by other individuals in the general population.

mean sea level (MSL) - The average height of the sea for all stages of the tide. Used as a benchmark for establishing groundwater and other elevations.

minimum detection limit (MDL) - The lowest level to which an analytical parameter can be measured with certainty by the analytical laboratory performing the measurement. While results below the MDL are sometimes measurable, they represent values that have a reduced statistical confidence associated with them (less than 95% confidence).

mixed waste - Waste that contains both a hazardous waste component regulated under Subtitle C of the Resource Conservation and Recovery Act (RCRA) and a radioactive component.

monitoring - The collection and analysis of samples or measurements of effluents and emissions for the purpose of characterizing and quantifying contaminants, and demonstrating compliance with applicable standards.

monitoring well - A well that collects groundwater for the purposes of evaluating water quality, establishing groundwater flow and elevation, determining the effectiveness of treatment systems, and determining whether administrative or engineered controls designed to protect groundwater are working as intended.

N

nuclide - A species of atom characterized by the number of protons and neutrons in the nucleus.

O

on site - The area within the boundaries of a site that is controlled with respect to access by the general public.

opacity - Under the Clean Air Act (CAA), a measurement of the degree to which emissions (e.g., smoke) other than water reduce the transmission of light and obscure the view of an object in the background.

operable unit (OU) - Division of a contaminated site into separate areas based on the complexity of the problems associated with it. Operable units may address geographical portions of a site, specific site problems, or initial phases of an action. They may also consist of any set of actions performed over time, or actions that are concurrent, but located in different parts of a site. An operable unit can receive specific investigation and a particular remedy may be proposed. A record of decision (ROD) is prepared for each operable unit (*see* Record of Decision).

outfall - The place where wastewater is discharged.

oxides of nitrogen (NO_x) - All oxides of nitrogen, except nitrous oxide, which is expressed as nitrogen dioxide (NO_2).

ozone (O_3) - A very reactive form of oxygen formed naturally in the upper atmosphere and providing a shield for the earth from the sun's ultraviolet rays. At ground level or in the lower atmosphere, it is pollution that forms when oxides of nitrogen and hydrocarbons react with oxygen in the presence of strong sunlight. Ozone at ground level can lead to health effects and cause damage to trees and crops.

P

percent recovery – For analytical results, the ratio of the measured amount, divided by the known (spiked) amount, multiplied by 100.

permit - An authorization issued by a federal, state or local regulatory agency. Permits are issued under a number of environmental regulatory programs, including the Resource Conservation and Recovery Act (RCRA), Clean Air Act (CAA), Clean Water Act (CWA), and Toxic Substances Control Act (TSCA). They grant permission to operate, to discharge, to construct, etc. Permit provisions may include emission/effluent limits and other requirements such as the use of pollution control devices, monitoring, record keeping and reporting. Also called a "license" or "certificate" under some regulatory programs.

pH - A measure of hydrogen ion concentration in an aqueous solution. Acidic solutions have a pH less than 7, neutral solutions have a pH of 7, and basic solutions have a pH greater than 7 and up to 14.

plume - A body of contaminated groundwater or polluted air flowing from a specific source. The movement of a groundwater plume is influenced by such factors as local groundwater flow patterns, the character of the aquifer in which groundwater is contained, and the density of contaminants. The movement of an air contaminant plume is influenced by the ambient air motion, the temperatures of the ambient air and of the plume, and the density of the contaminants.

point source - Any confined and discrete conveyance (e.g., pipe, ditch, well, or stack) of a discharge.

pollutant - Any hazardous or radioactive material naturally occurring or added to an environmental media, such as air, soil, water, or vegetation.

pollution prevention (P2) - Preventing or reducing the generation of pollutants, contaminants, hazardous substances, or wastes at the source, or reducing the amount for treatment, storage, and disposal through recycling. Pollution prevention can be achieved through reduction of waste at the source, segregation, recycle/reuse, and the efficient use of resources and material substitution. The potential benefits of pollution prevention include the reduction of adverse environmental impacts, improved efficiency, and reduced costs.

polychlorinated biphenyls (PCBs) - A family of organic compounds used from 1926 to 1979 (when they were banned by EPA) in electrical transformers, lubricants, carbonless copy paper, adhesives, and caulking compounds. PCBs are extremely persistent in the environment because they do not break down into different and less harmful chemicals. PCBs are stored in the fatty tissues of humans and animals through the bioaccumulation process.

potable water - Water of sufficient quality for use as drinking water without endangering the health of people, plants, or animals.

precision - The dispersion around a central value, usually represented as a variance, standard deviation, standard error, or confidence interval.

putrescible waste - Garbage that contains food and other organic biodegradable materials. There are special management requirements for this waste in 6 NYCRR Part 360.

Q

qualifier - A letter or series of letter codes indicating that the associated value is estimated. A qualified value is an estimated value.

quality assurance (QA) - In environmental monitoring, any action to ensure the reliability of monitoring and measurement data. Aspects of QA include procedures, inter-laboratory comparison studies, evaluations, and documentation.

quality control (QC) - In environmental monitoring, the routine application of procedures to obtain the required standards of performance in monitoring and measurement processes. QC procedures include calibration of instruments, control charts, and analysis of replicate and duplicate samples.

R

radioactive series - A succession of nuclides, each of which transforms by radioactive disintegration into the next until a stable nuclide results. The first member of the series is called the parent and the intermediate members are called daughters or progeny.

radioactivity - The spontaneous transition of an atomic nucleus from a higher energy to a lower energy state. This transition is accompanied by the release of a charged particle or electromagnetic waves from the atom. Also known as “activity.”

radionuclide - A radioactive element characterized by the number of protons and neutrons in the nucleus. There are several hundred known radionuclides, both artificially produced and naturally occurring.

recharge - The process by which water is added to a zone of saturation (aquifer) from surface infiltration typically when rainwater soaks through the earth to reach an aquifer.

recharge basin - A basin (natural or artificial) that collects water. The water will infiltrate to the aquifer.

Record of Decision (ROD) - A document that records a regulator agency’s decision for the selected remedial action. The ROD also includes a responsiveness summary and a bibliography of documents that were used to reach the remedial decision. When the ROD is finalized, remedial design and implementation can begin.

relative percent difference – A measure of precision, expressed by the formula: RPD = [(A-B)/(A+B)] x 200, where A equals the concentration of the first replicate: and B equals the concentration of the second replicate.

release - Spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing of a hazardous substance, pollutant, or contaminant into the environment. The National Contingency Plan also defines the term to include a threat of release.

rem - Stands for “roentgen equivalent man,” a unit by which human radiation dose is assessed. This is a risk-based value used to estimate the potential health effects to an exposed individual or population.

remedial (or remediation) alternatives - Options considered under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) for cleaning up contamination at a site, such as an operable unit (OU) or area of concern (AOC). Remedial actions are long-term activities that stop or substantially reduce releases, or prevent possible releases, of hazardous substances that are serious but not immediately life-threatening. See also feasibility study (FS) and record of decision (ROD).

remedial investigation (RI) - An investigation that includes extensive sampling and laboratory analyses to characterize the nature and extent of contamination, define the pathways of migration, and measure the degree of contamination in surface water, groundwater, soils, air, plants, and animals. Information gathered during the RI attempts to fully describe the contamination problem at the site so that the appropriate remedial action can be developed.

removal actions (RA) or removals - Interim actions that are undertaken to prevent, minimize, or mitigate damage to the public health or environment that may otherwise result from a release or threatened release of hazardous substances, pollutants, or contaminants pursuant to Comprehensive Environmental Response, Compensation, and Recovery Act (CERCLA), and that are not inconsistent with the final remedial action. Under CERCLA or Superfund, the U.S. Environmental Protection Agency may respond to releases or threats of releases of hazardous substances by starting a removal action. The purpose of the removal action is to stabilize or clean up an incident or site that poses an immediate threat to public health or welfare. Removal actions differ from remedial actions. However, removal actions must contribute to the efficiency of future remedial actions.

residual fuel – Crude oil, Nos. 1 and 2 fuel oil that have a nitrogen content greater than 0.05 weight percent, and all fuel oil Nos. 4, 5, and 6, as defined by the American Society of Testing and Materials in ASTM D396-78, *Standard Specifications for Fuel Oils*, (c. 2001).

runoff - The movement of water over land. Runoff can carry pollutants from the land into surface waters or uncontaminated land.

S

sampling - The extraction of a prescribed portion of an effluent stream or environmental media for purposes of inspection or analysis.

sediment - The layer of soil and minerals at the bottom of surface waters, such as streams, lakes, and rivers.

sensitivity - The minimum amount of an analyte that can be repeatedly detected by an instrument.

sievert (Sv) - A unit for assessing the risk of human radiation dose, used internationally and with increasing frequency in the United States. One sievert is equal to 100 rem.

skyshine - Radiation emitted over an open-topped shielded enclosure and reflected by air so as to radiate people on the outside.

sludge - Semisolid residue from industrial or water treatment processes.

soil vapor extraction - An *in situ* (in-place) method of extracting volatile organic chemicals from soil. The chemicals are extracted by applying a vacuum to the soil and collecting the air, which can be further treated to remove the chemicals or discharged to the atmosphere.

sole source aquifer - An area defined by the U.S. Environmental Protection Agency as being the primary source of drinking water for a particular region. Includes the surface area above the sole source aquifer and its recharge area.

spallation - The process by which a high energy particle striking a nucleus causes fragments to be ejected from the nucleus. The resulting atom is usually radioactive.

stable - Nonradioactive.

stakeholder - People or organizations with vested interests in BNL and its environment and operations. Stakeholders include federal, state, and local regulators; the public; the U.S. Department of Energy; and BNL staff.

State Pollution Discharge Elimination System (SPDES) - A program under which permits are issued by the state to regulate wastewater discharges. The permit specifies the maximum discharge limits for the parameters present in the particular discharge.

stripping - A process used to remove volatile contaminants from a substance (*see also* Air Stripping).

sump - A pit or tank that catches liquid runoff for drainage or disposal.

T

thermoluminescent dosimeter (TLD) - A device used to measure radiation dose to occupational workers or radiation levels in the environment.

total volatile organic compounds (TVOC) - A sum of all individual VOC concentrations detected in a given sample.

trichloroethylene (TCE) (also, trichloroethene) - A stable, colorless liquid with a low boiling point. TCE has many industrial applications, including use as a solvent and as a metal degreasing agent. TCE may be toxic to people when inhaled or ingested, or through skin contact, and can damage vital organs, especially the liver (*see also* volatile organic compounds).

tritium - The heaviest and only radioactive nuclide of hydrogen, with a half-life of 12.3 years and a very low energy radioactive decay (beta emitter).

U

underground injection control (UIC) - Any hole whose vertical dimensions are larger than its largest horizontal dimensions and used for disposal of waste water.

underground storage tank (UST) - A stationary device, constructed primarily of nonearthen material, designed to contain petroleum products or hazardous materials. In a UST, 10% or more of the volume of the tank system is below the surface of the ground.

upgradient/upslope - A location of higher groundwater elevation; analogous to “upstream.”

V

vernal pool - A small, isolated, and contained basin that holds water on a temporary basis, most commonly during winter and spring. It has no aboveground outlet for water and is extremely important to

the life cycle of many amphibians (such as the spotted salamander), as it is too shallow to support fish, a major predator of amphibian larvae.

volatile organic compounds (VOCs) - Secondary petrochemicals, including light alcohols, acetone, trichlorethylene, perchloroethylene, dichloroethylene, benzene, vinyl chloride, toluene, and methylene chloride. These potentially toxic chemicals are used as solvents, degreasers, paints, thinners, and fuels. Because of their volatile nature, they readily evaporate into the air, increasing the potential for human exposure. Due to their widespread industrial use, they are commonly found in soil and groundwater.

W

waste minimization - An action that avoids or reduces the generation of waste by source reduction, reduces the toxicity of hazardous waste, improves energy usage, or recycling. This action is consistent with the general goal of minimizing present and future threats to human health, safety, and the environment and is associated with pollution prevention, but more likely to occur after the waste has already been generated.

water table - The water-level surface below the ground at which the unsaturated zone ends and the saturated zone begins. It is the level to which a well that is screened in the unconfined aquifer would fill with water.

watershed - The region draining into a river, a river system, or a body of water.

weighting factor - A factor which, when multiplied by the dose equivalent delivered to a body organ or tissue, yields the equivalent risk due to a uniform radiation exposure of the whole body.

wind rose - A diagram that shows the frequency of wind from different directions at a specific location.