

CHAPTER 18

REGULATIONS GOVERNING THE CERTIFICATION OF LABORATORIES AND ENVIRONMENTAL MEASUREMENTS

Authority

N.J.S.A. 13:1E-1 et seq., 13:1K-6 et seq., 26:2D-70 et seq., 58:10-23.11 et seq., 58:10A-1 et seq. and 58:12A-1 et seq.

Source and Effective Date

R.2001 d.224, effective June 11, 2001.
See: 33 N.J.R. 1063(a), 33 N.J.R. 2284(c).

Executive Order No. 66(1978) Expiration Date

Chapter 18, Regulations Governing the Certification of Laboratories and Environmental Measurements, expires on June 11, 2006.

Chapter Historical Note

Chapter 18, Regulations Governing Laboratory Certification and Standards of Performance, was adopted as R.1981 d.279, effective August 6, 1981. See: 13 N.J.R. 260(d), 13 N.J.R. 481(c).

Pursuant to Executive Order No. 66(1978), Chapter 18, Regulations Governing Laboratory Certification and Standards of Performance, was readopted as R.1986 d.351, effective August 6, 1986. See: 18 N.J.R. 1239(b), 18 N.J.R. 1797(b).

Pursuant to Executive Order No. 66(1978), Chapter 18, Regulations Governing Laboratory Certification and Standards of Performance, was readopted as R.1991 d.385, effective July 3, 1991. See: 23 N.J.R. 1109(a), 23 N.J.R. 2346(c).

Chapter 18, Regulations Governing Laboratory Certification and Standards of Performance, was repealed and a new Chapter 18, Regulations Governing the Certification of Laboratories and Environmental Measurements, was adopted by R.1996 d.307, effective July 1, 1996. See: 27 N.J.R. 4761(a), 28 N.J.R. 3330(c).

Pursuant to Executive Order No. 66(1978), Chapter 18, Regulations Governing the Certification of Laboratories and Environmental Measurements, was readopted as R.2001 d.224, effective June 11, 2001. See: Source and Effective Date. See, also, section annotations.

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SUBCHAPTER 1. GENERAL PROVISIONS

7:18-1.1 Scope and authority

(a) This chapter constitutes the Department's regulations governing certification of laboratories performing sample analyses for compliance with any of the statutes listed in (c) below, with any regulations or orders issued pursuant to those statutes, or with the Contract Laboratory Program.

(b) This chapter establishes the procedures for obtaining and maintaining certifications, and the criteria and procedures that certified environmental laboratories shall follow in handling, preserving, and analyzing regulatory samples, and in collecting samples for acute toxicity testing.

(c) This chapter is adopted pursuant to the following statutes:

1. The Safe Drinking Water Act, N.J.S.A. 58:12A-1 et seq.;

2. The Water Pollution Control Act, N.J.S.A. 58:10A-1 et seq.;

3. The portion of the Radiation Protection Act governing radon and radon progeny, N.J.S.A. 26:2D-70 et seq.;

4. The Solid Waste Management Act, N.J.S.A. 13:1E-1 et seq.;

5. The Industrial Site Recovery Act, N.J.S.A. 13:1K-6 et seq.; and

6. The Spill Compensation and Control Act, N.J.S.A. 58:10-23.11 et seq.

7:18-1.2 Construction

These rules shall be liberally construed to permit the Department to discharge its statutory functions and to effectuate the purposes of the laboratory certification program.

7:18-1.3 Purposes of the regulations

(a) This chapter is promulgated for the following purposes:

1. To establish a certification program for laboratories performing environmental analyses, and to confine a laboratory's scope of certification to the specific parameters, techniques, method references, and corresponding approved methods as shown on the certified environmental laboratory's annual certified parameter list;

2. To establish the administrative procedures to be followed by certified environmental laboratories, and by laboratories seeking to become certified environmental laboratories;

3. To require that certification status be contingent upon continued compliance with the standards of performance set forth herein, including, but not limited to, standards pertaining to facility conditions, equipment and supplies, personnel, quality assurance and quality control, data reporting and data maintenance; and

4. To establish the enforcement procedures that the Department shall follow to ensure that a certified environmental laboratory is in compliance with this chapter.

(b) Compliance with this chapter will assist a laboratory in meeting the data quality requirements of State regulatory programs with regard to accuracy, precision, completeness, comparability, and representativeness. These rules regulate sample collection (acute toxicity testing only), handling, preservation, and analysis. The laboratory shall produce data with known quality assurance and quality control procedures, and in accordance with approved techniques and reference methods.

7:18-1.4 Certification program requirements

(a) A laboratory may request certification in the New Jersey Environmental Laboratory Certification Program (NJ-ELCP) pursuant to N.J.A.C. 7:18 or in the New Jersey National Environmental Laboratory Accreditation Program (NJ-NELAP) pursuant to the National Environmental Laboratory Accreditation Conference (NELAC) standards, incorporated herein by reference at N.J.A.C. 7:18-1.5(d).

1. A laboratory shall not apply for or maintain simultaneous certification in the NJ-ELCP and NJ-NELAC.

2. A laboratory which has obtained NJ-NELAP certification shall comply with all sampling, enforcement, and data submittal requirements as established by N.J.A.C. 7:18 pursuant to the statutes specified at N.J.A.C. 7:18-1.1(c).

(b) A laboratory that analyzes samples for the purpose of establishing compliance with any regulatory program shall obtain and maintain certification as a certified environmental laboratory in accordance with this chapter. An analysis performed by a laboratory that is not a certified environmental laboratory does not establish compliance with any regulatory program.

(c) When analyzing regulatory samples, a certified environmental laboratory shall perform only those methods for which it has received certification or has received approval to use as alternate test procedures (ATPs) pursuant to N.J.A.C. 7:18-2.20. The certified environmental laboratory shall analyze only those parameters that are included in a valid annual certified parameter list (ACPL) issued pursuant to N.J.A.C. 7:18-2.6(b).

(d) The Department-Sanctioned Analytical Methods (DSAMs) are the methods approved for use by certified environmental laboratories. The designation of a method as a DSAM is described in N.J.A.C. 7:18-2.21.

(e) Under N.J.A.C. 7:18-2.6(b), a certified environmental laboratory will receive a certificate and an Annual Certified Parameter List (ACPL) from the Department. The certified environmental laboratory shall conspicuously display these documents in a location on its premises visible to the public.

Amended by R.2001 d.277, effective August 6, 2001.
See: 33 N.J.R. 449(a), 33 N.J.R. 2664(a).

Inserted a new (a) and recodified former (a) through (d) as (b) through (e).

7:18-1.5 Incorporation by reference

(a) The following regulations promulgated by the USEPA, together with all amendments and supplements, are incorporated by reference into this chapter:

1. The "National Primary and Secondary Drinking Water Regulations," 40 CFR 141 and 40 CFR 143;

2. The "Guidelines Establishing Test Procedures for the Analysis of Pollutants," 40 CFR 136; and

3. The methods listed in Subchapter I, Solid Waste, 40 CFR 260, 261.

(b) All existing CERCLA CLP methods, and all future new or modified CERCLA CLP methods, are incorporated by reference into this chapter. CERCLA CLP methods are available from: EPA Contract Laboratory Program, Sample Management Office, P.O. Box 815, Alexandria, VA 22313. All new or modified methods are incorporated when Invitation for Bid (Bid) documents containing these methods are published in the Commerce Business Daily. The Commerce Business Daily is available from U.S. Department of Commerce, Washington, DC 20230, (202) 783-3238.

(c) The Department's analytical methods for sludge analysis at N.J.A.C. 7:14C, together with all amendments and supplements, are incorporated by reference into this chapter.

(d) The National Environmental Laboratory Accreditation Conference (NELAC) Standards (EPA600/R-99/068), Chapters 1 through 5, July 1, 1999, together with amendments and supplements thereto, are incorporated by reference into this chapter. Copies of the NELAC standards are available on the NELAC internet site at <http://www.epa.gov/ttn/nelac>. Copies of the NELAC Standards may also be purchased from the USEPA, Office of Research and Development, 3210 Triangle Park, NC 27711, (919) 541-1120.

Amended by R.2001 d.224, effective July 2, 2001.
See: 33 N.J.R. 1063(a), 33 N.J.R. 2284(c).

In (c), amended N.J.A.C. reference.

Amended by R.2001 d.277, effective August 6, 2001.
See: 33 N.J.R. 449(a), 33 N.J.R. 2664(a).

Added (d).

7:18-1.6 Program information; notices; submittals

(a) Unless otherwise specified, any questions concerning the requirements of this chapter should be directed to the Department's Office of Quality Assurance at (609) 292-3950. Written inquiries can be directed to the following address:

New Jersey Department of Environmental Protection
Office of Quality Assurance
PO Box 424
Trenton, NJ 08625-0424

(b) Unless otherwise specified, any submittals of PE sample results, submittals of documents, notices of other communications required to be made to the Department under this chapter shall be made to the address specified in (a) above. Applications for certification and for renewals and modifications of certifications shall be submitted to the address specified in (a) above.

Administrative change.

See: 28 N.J.R. 4098(a).

Amended by R.2001 d.224, effective July 2, 2001.

See: 33 N.J.R. 1063(a), 33 N.J.R. 2284(c).

7:18-1.7 Definitions

The following words and terms, when used in this chapter, shall have the following meanings. If a definition in this section differs from the corresponding definition in any regulation or other document incorporated by reference under N.J.A.C. 7:18-1.5, the definition in the document incorporated by reference shall control.

“Acceptably analyze” means to analyze a sample in a manner that satisfies the requirements of N.J.A.C. 7:18-2.13(j).

“Acclimation” means, for acute toxicity testing, an organism’s physiological adjustment to environmental changes including, but not limited to, changes in temperature and salinity.

“Accreditation” means the process by which an agency or organization evaluates and recognizes a laboratory as meeting certain predetermined qualifications or standards, thereby accrediting the laboratory. In the context of the National Environmental Laboratory Accreditation Program (NELAP), this process is a voluntary one.

“Accredited” means having the approval conferred upon schools, institutions, or programs where appropriate by a nationally recognized regional accrediting agency or association as determined by either the United States Secretary of Education, State Commissioner of Education, or State Chancellor of Higher Education.

“Accrediting authority” means the territorial, state or Federal agency having responsibility and accountability for environmental laboratory accreditation and which grants accreditation.

“ACPL” means Annual Certified Parameter List and is a list that is sent annually to a certified environmental laboratory showing the regulatory programs, analytical techniques, method references and corresponding methods, specific parameters or group thereof for which the laboratory is certified to analyze regulatory samples.

“Acute MCL violation” means any violation of the maximum contaminant level (MCL) for any parameter specified by the State as posing an acute risk to human health including the presence of fecal coliform or *E. coli*, and nitrate (>10mg/L), nitrite (>one mg/L) or nitrate/nitrite (>10mg/L).

“Acute toxicity” means, for acute toxicity testing, a lethal or adverse sublethal effect to an organism exposed to a toxic substance for no more than 96 hours.

“Acute toxicity testing” means the standardized procedures for determining the quantitative lethal or sublethal effects of a toxic substance on an organism.

“Affiliate” means, with respect to any individual or entity, another individual or entity who has a controlling interest in such individual or entity; in whom such individual or entity has a controlling interest; or who is under common control with such individual or entity.

“Alternate Test Procedure (ATP)” means a procedure that:

1. Contains modifications not permitted in a method listed as a DSAM; or
2. Is a method not listed as a DSAM for the monitoring of one or more parameters of interest for the Safe Drinking Water Act, New Jersey Pollutant Discharge Elimination System, New Jersey Spill Compensation Act, New Jersey Solid Waste Management Act, Industrial Site Recovery Act, and New Jersey Underground Storage Tanks Program.

“Analytical reagent (AR) grade,” “ACS reagent grade” and “reagent grade” mean reagents that conform to the current specifications of the Committee on Analytical Reagents of the American Chemical Society.

“Analyze-immediately parameter” means a parameter for which analysis must be performed within 15 minutes after the sample is collected. Examples of analyze-immediately parameters include chlorine dioxide, dissolved oxygen with probe, pH, ozone, residual chlorine, sulfite and temperature.

“ANSP—Goulden” means the publication entitled “Daphnia Bioassay Workshop,” Dr. Clyde Goulden and Ms. Linda Henry; The Academy of Natural Sciences of Philadelphia, Division of Limnology and Ecology. This reference is a source for daphnid culturing and testing techniques used in N.J.A.C. 7:18-7, Toxicity Testing.

“Applicant” means a laboratory applying to the Department to become a certified environmental laboratory.

“Arochlor” or “Aroclor” means the trade name for a series of commercial polychlorinated biphenyl and terphenyl mixtures, often termed PCBs or polychlorinated biphenyls.

“ASTM D1193-91” means, for chemical testing, “Standard Specifications for Reagent Water,” D1193-91 (and later revisions), American Society for Testing and Materials.

“ASTM D 4229-84” means “Standard Practice for Conducting Static Acute Toxicity Tests on Waste-waters with Daphnia,” D 4229-84, American Society for Testing and Materials. This reference method is a source of daphnid culturing and testing techniques used in N.J.A.C. 7:18-7, Toxicity Testing.

“ASTM E 724-80” means “Standard Practice for Conducting Static Acute Toxicity Tests with Larvae of Four Species of Bivalve Molluscs,” E 724-80; American Society for Testing and Materials. This reference method is a source for standardized culturing and testing techniques in N.J.A.C. 7:18-7, Toxicity Testing.

“ASTM E 729-80” means “Standard Practice for Conducting Acute Toxicity Tests With Fishes, Macroinvertebrates, and Amphibians,” E 729-80, American Society for Testing and Materials. This reference method is a source for standardized culturing and testing techniques in N.J.A.C. 7:18-7, Toxicity Testing.

“ASTM-31” means Annual Book of the American Society for Testing and Materials, Part 31.

“Asymptotic LC_{50} ” means, for acute toxicity testing, the toxicant concentration at which the LC_{50} , the lethal concentration at which 50 percent death of the test organisms occurs during an acute toxicity test, becomes a constant for a prolonged exposure time.

“Authorized measurement protocols” for radon/radon progeny-in-air means the DSAMs for Category RA1, radon/radon progeny-in-air, which are the approved methods for use by a certified laboratory when performing radon/radon progeny-in-air analysis. These DSAMs include the “Indoor Radon and Radon Decay Product Measurement Device Protocols,” USEPA 402-R-92-004 and the “Interim Protocols for Screening and Follow-up Radon and Radon/Decay Product Measurements,” USEPA 520/l-86-014.

“Authorized proficiency program” or “APP” means the USEPA Radon/Radon Progeny Measurement Proficiency Program, Eastern Environmental Radiation Facility, Montgomery, Alabama 36109, or other program authorized by the Department in writing as being equally stringent. The APP provides the Department with a laboratory’s radon/radon progeny results of PE samples. The Department uses the laboratory’s results and the expected acceptable limits to partially assess its analytical performance. Pursuant to N.J.A.C. 7:18-2.13, successful analysis of radon/radon progeny PE samples is necessary for obtaining and maintaining radon/radon progeny-in-air certification.

“Bioassay” means, for acute toxicity testing, a determination of the concentration or dose of a given material necessary to cause a specific response in a test organism under stated conditions. Bioassay refers to an acute toxicity test.

“Biomonitoring” means, for acute toxicity testing, all test methods that utilize a biological system, or any of its parts, to assess the presence or effects of one or more pollutants and/or environmental factors, either alone or in combination.

“Bureau” means one of the management units of the Department.

“Category” means one of the assigned designations that includes groups of parameters, their techniques of analysis, method references, and corresponding approved methods, for which certification is offered.

“CERCLA (CLP) Program” or “Contract Laboratory Program” means the USEPA contract program for the procurement of analytical data in support of its CERCLA program and the seven Categories for which a laboratory may obtain certification from the Department for its CERCLA programs.

“Certification” means a laboratory’s status as a certified environmental laboratory, or the document issued by the Department pursuant to N.J.A.C. 7:18-2.6, evidencing that status.

“Certification of Radon Testers and Mitigators” means N.J.A.C. 7:28-27.

“Certification year” means a one-year period beginning on July 1 of one year and ending on June 30 of the following year. A particular certification year is identified by the calendar year in which it ends. For example, certification year 1996 is the certification year ending on June 30, 1996.

“Certified environmental laboratory” means any laboratory, facility, consulting firm, government or private agency, business entity or other person that the Department has authorized pursuant to this chapter to perform analysis in accordance with the procedures of a given analytical method using a particular technique as set forth in a certain methods reference document, and to report the results from the analysis of environmental samples in compliance with a Departmental regulatory program.

“Certified radon environmental laboratory” means a radiochemical environmental laboratory that the Department has certified pursuant to this chapter to analyze samples for the presence of radon and/or radon progeny-in-air in a facility separate from the location in which the sample was taken, and that uses stationary measurement detection equipment.

“Certified radon measurement business” means a commercial business enterprise certified pursuant to N.J.A.C. 7:28-27 to sell devices and/or test for radon/radon progeny-in-air.

“Certified radon measurement specialist” means an individual certified pursuant to N.J.A.C. 7:28-27 to perform and/or evaluate radon/radon progeny-in-air measurements for a certified radon measurement business.

“Certified radon measurement technician” means an individual certified pursuant to N.J.A.C. 7:28-27 to perform radon/radon progeny-in-air measurement activities.

“Certified thermometer” means a thermometer that has documentation from the manufacturer showing that it has been calibrated against a National Institute of Standards and Technology (NIST), formerly National Bureau of Standards (NBS), thermometer for the temperature ranges employed by the environmental laboratory and the correction factors from that comparison.

“Chemical testing” means the chemical analysis and physical testing of environmental samples for inorganic and organic parameters and physical properties.

“Chronic toxicity” means death or other adverse impacts that affect the growth, survival, or reproductive success of an organism or its progeny after a relatively long exposure period to toxic substances. Chronic toxicity is measured using intermediate-term or long-term chronic toxicity tests.

“Class ‘A’ glassware” means glassware satisfying the applicable requirements for Class “A” glassware established by the National Institute of Standards and Technology (formerly the National Bureau of Standards).

“Client” means the person who requests an analysis from a laboratory.

“Cold-water fishes” means, for acute toxicity testing, those species of fish living and breeding in aquatic ecosystems with a maximum water temperature between 10 degrees Celsius and 16 degrees Celsius.

“Collector” means the person who collects a sample.

“Compliance analysis” means the analysis of a sample that is required by law, or by Departmental regulation or order.

“Composite sample” means a sample composed of several discrete samples combined in a known proportion. For NJPDES wastewater monitoring, a composite sample is a sample composed of several discrete samples collected at equal time intervals, or proportionally to the flow rate of the discharge.

“Confluent growth” means a bacterial growth that covers the entire filtration area of the filter with no discrete colonies when performing microbiological analysis by the membrane-filter techniques listed in Categories DW1, WP1, and SHW1. When confluent growth occurs, another sample must be obtained and analyzed using higher dilutions for the membrane-filter technique or using another approved technique.

“Contaminant or grouped-contaminants” means a specific analyte or group of analytes which are included in the general term “parameter” for the purposes of this chapter.

“Control” means, for acute toxicity testing, the group of test organisms in a chamber under test conditions that are exposed to dilution water only and/or the natural water to which they are normally exposed.

“Controlling interest” means any of the following:

1. The direct or indirect beneficial ownership, by the person asserted to have a controlling interest and any of such person’s affiliates, of at least 50 percent of the voting stock or other equity interest in a person;

2. The holding of any direct or indirect beneficial interest in at least 50 percent of the income or profits of a person, by the person asserted to have a controlling interest; or

3. The existence of any other relationship between the person asserted to have a controlling interest and the person controlled, which relationship in fact constitutes control over the affairs of the person controlled.

“Criteria—1986” means “Quality Criteria for Water 1986,” USEPA, Office of Water Regulations and Standards, Washington, D.C., USEPA 440/5-86-001. This reference was used to establish purity guidelines for test organism culture water in N.J.A.C. 7:18-7, Toxicity Testing.

“Custodian” means an individual, designated by the laboratory manager, trained in the proper procedures to receive samples into the environmental laboratory.

“Definitive test” means, for acute toxicity testing, a short-term toxicity test used to measure the acute toxicity of effluents or materials.

“Department” means the New Jersey Department of Environmental Protection.

“Department validated methods” means analytical methods developed and validated for analysis of specified matrices by the Department or by Department sponsored research.

“Detection limit” (DL) or “instrument detection limit” (IDL) means the lowest concentration above background noise level that an instrument can detect reliably.

“Dilution factor” (DF) means, for chemical testing, a multiplication factor applied to a calculated sample result to compensate for sample dilution. The dilution factor is determined as follows:

$$DF = \text{Diluted sample volume} / \text{Original sample volume}$$

“Dilution water” means, for acute toxicity testing, unpolluted water of desired quality to be used in preparing the different test concentrations of the effluent and controls. For example, dilution water is usually collected from a point that is as close as possible to, but upstream or outside of, the effluent’s zone of impact.

“Discharge” means an intentional or unintentional action or omission resulting in the releasing, spilling, leaking, pumping, pouring, emitting, emptying, or dumping of a pollutant into the waters of the State, onto land or onto wells from which the pollutant might flow or drain into such waters, or into waters, or onto lands outside the jurisdiction of the State which pollutant enters the waters of the State, and shall include the release of any pollutant into a municipal treatment works.

“Drinking Water Program” means the Department’s program implementing the Safe Drinking Water Act, N.J.S.A. 58:12A-1 et seq.

“Drinking water sample” means a regulatory sample analyzed to determine compliance with the Drinking Water Program.

“DSAM” means Department Sanctioned Analytical Method. DSAMs are methods that laboratories may be certified to perform if they qualify under the requirements of this chapter. Mandatory methods, published or referenced in the Code of Federal Regulations, become DSAMs on their stated effective date. New or revised CERCLA CLP methods become DSAMs when new or revised CLP methods are included in Invitation for Bid documents published in the Commerce Business Daily. DSAMs that are needed for analysis of Department program regulatory samples, are designated as DSAMs by procedures described at N.J.A.C. 7:18-2.21.

“DSM” means Department Selected Method. DSMs are methods selected for designation as DSAMs. DSMs include methods that the Department has determined are necessary for the analysis of Program regulatory samples, but are not mandatory methods published or referenced in the Code of Federal Regulations and are not new CERCLA CLP methods published in Invitation for Bid documents published in the Commerce Business Daily. DSMs may include:

1. Published USEPA discretionary methods;
2. Methods published by professional organizations with recognized expertise in method development such as ASTM, APHA, and USGS; and
3. Departmental validated methods.

“EC₅₀” means, for acute toxicity testing, the statistical estimate of the toxicant concentration that has a specified adverse effect (such as immobilization, change in respiration rate, or loss of equilibrium) on 50 percent of test organisms after a specific time of exposure.

“EDL” means an electrodeless discharge lamp used in atomic absorption spectroscopy.

“Effective concentration (EC)” means, for acute toxicity testing, the statistical estimate of the toxicant concentration that has a specified adverse effect (such as immobilization,

change in respiration rate, or loss of equilibrium) in a given time.

“Effluent” means the outflow from a point source.

“EPA Acute Methods #013-1985” means, for acute toxicity testing, “Methods for Measuring The Acute Toxicity of Effluents to Freshwater and Marine Organisms,” 3rd ed, USEPA, Environmental Monitoring and Support Laboratory, Cincinnati, Ohio 45268, USEPA-600-4-85-013.

“EPA Acute Methods #027F-1993” means, for Acute Toxicity Testing, Methods for Measuring The Acute Toxicity of Effluents for Freshwater and Marine Organisms, 4th ed., USEPA, Environmental Monitoring and Support Laboratory, Cincinnati, Ohio 45268, EPA-600/4-90/027F.

“EPA Microbiological Methods” means, for microbiological testing, “Microbiological Methods for Monitoring the Environment,” USEPA-600/8-78-017.

“Exposure time” means, for acute toxicity testing, the time of exposure of test organisms to a test solution for parameters in the Acute Toxicity Testing Category.

“Field of testing” means NELAC’s approach to accrediting laboratories by program, method and analyte. Laboratories requesting accreditation for a program-method-analyte combination or for an up-dated/improved method are required to submit only that portion of the accreditation process not previously addressed.

“Field analyses” means those measurements taken directly at the site being sampled using portable meters or other portable instrumentation.

“Flow-through bioassay” means, for acute toxicity testing, a test in which the solution is replaced continuously in the test chambers for the test duration.

“GC” means gas chromatography.

“Grab sample” means an individual sample collected over a time period of less than 15 minutes.

“Guidelines Establishing Test Procedures for the Analysis of Pollutants” means the regulations promulgated by the USEPA at 40 CFR 136, together with all amendments and supplements.

“HASL 1973” means “HASL, Procedure Manual,” edited by John H. Harley. HASL 300, ERDA Health and Safety Laboratory, New York, NY, 1973. Pursuant to N.J.A.C. 7:18-6, a certified laboratory performing analysis of the Department’s additional radiochemical and radionuclide parameters not listed in the Safe Drinking Water Act must reference HASL 1973.

“Hazardous Waste Management System: General” means the regulations promulgated by the USEPA at 40 CFR 260, together with all amendments and supplements.

“HYICP” or “Hydride Generation Inductively Coupled Plasma—Atomic Emission Spectroscopy,” is an inductively coupled plasma technique employing sodium borohydride (NaBH_4) and iodine to produce volatile hydrides of antimony, arsenic, and selenium for low-concentration aqueous samples.

“ICP/MS” means Inductively Coupled Plasma/Mass Spectrometry.

“Identification and Listing of Hazardous Waste” means the regulations promulgated by the USEPA at 40 CFR 261, together with all amendments and supplements.

“Incipient LC_{50} ” means, for acute toxicity testing, “Asymptotic LC_{50} ”.

“Indicator parameter” is a parameter that is identified in a proficiency test and is used to evaluate the overall analytical performance of a laboratory on that specific method. Pursuant to N.J.A.C. 7:18-2.13, the Department uses a laboratory’s performance on analyzing an indicator parameter to determine the laboratory’s certification status on all parameters covered by that analytical method.

“Juvenile” means, for acute toxicity testing, the fishes that are greater than 20 days but less than or equal to 60 days post hatch.

“Laboratory” means any individual or other entity, including without limitation, corporations, associations, partnerships, joint ventures, and the United States, any state, any foreign country or government, and any political subdivision or agency thereof, that performs analyses of samples.

“Laboratory grade water” means a supply of water meeting or exceeding the specifications given in N.J.A.C. 7:18-7.4(b), to be used for the holding, spawning, and rearing of aquatic organisms used in acute toxicity testing.

“Laboratory pure water” means distilled, deionized, or charcoal treated water that meets the requirements of:

1. N.J.A.C. 7:18-4.5(e), for microbiological testing;
2. N.J.A.C. 7:18-6.2, for radiochemical testing; or
3. N.J.A.C. 7:18-7.4, for acute toxicity testing.

“Larvae” means, for acute toxicity testing, the fishes that are less than or equal to 20 days post hatch.

“Lethal concentration (LC)” means, for acute toxicity testing, the statistical estimate of the toxicant concentration producing death of the test organisms. LC is usually defined as the median (50 percent) lethal concentration, LC_{50} , i.e. concentration killing 50 percent of tested organisms at a specific time of exposure, for example 96-hour LC_{50} .

“ LC_{50} ” means, for acute toxicity testing, the lethal concentration at which 50 percent of tested organisms are killed over a specific time of exposure.

“LC Method” means Lucas Cell Method, USEPA/600/2-87/082, March 1989, a DSAM for the analysis of radon in drinking water samples.

“LS Method” means Liquid Scintillation Method, USEPA/600/28761082, March 1989, a DSAM for the analysis of radon in drinking water samples.

“Macro analysis” means the determination of parameters at concentrations in the high part per million or percent range.

“Manual” means “Manual for the Certification of Laboratories Analyzing Drinking Water, Criteria and Procedures Quality Assurance,” USEPA/570/9-90/008, USEPA, Office of Water (WH-550D), Washington, DC 20460, as updated or supplemented. This reference is the Federal training and standard operating procedures manual for Federal, state, and local certification officers of drinking water laboratories for microbiological, chemical, and radiochemical testing.

“Maximum contaminant level (MCL)” means the maximum permissible level of a contaminant allowed in drinking water under the National Primary Drinking Water Regulations.

“Membrane filtration (MF) method” means a method for determining the bacterial count in a water sample. In this method, a known volume of water is filtered through a membrane filter of optimum pore size for full bacterial retention. The filter is incubated in contact with culture medium to provide nutrients for bacterial growth. After incubation at a prescribed time and temperature, the cultures are examined for bacterial colonies that are counted and recorded per 100 mL of water sample.

“Method detection limit” (MDL) means the minimum concentration of a substance that can be measured and reported with 99 percent confidence that the analyte concentration is greater than zero and is determined from analysis of a sample in a given matrix type containing the analyte according to the Guidelines Establishing Test Procedures for the Analysis of Pollutants, 40 CFR 136, Appendix B.

“Method reference” means the name, abbreviation or acronym (for example, USEPA, ASTM, USGS) of the organization that has developed an approved method or of the publication containing an approved method. The method reference, together with the method number, specifically identifies a method.

“Methods for Measuring Acute Toxicity—EPA” means “Methods for Measuring Acute Toxicity of Effluents to Aquatic Organisms,” USEPA, Environmental Monitoring and Support Laboratory, Cincinnati, Ohio, EPA-600/4-78-012.

“Micro analysis” means the determination of trace quantities of parameters at concentrations in the low and sub part per million range.

“Modified static toxicity test” means, for acute toxicity testing, the “Renewal Toxicity Test.”

“Most probable number (MPN)” means a quantitative designation of microbial population which is determined by a statistical method. In this method, a multiple dilution tube technique is used with a standard culture medium. The tubes are incubated and observed for gas production. Results of these tubes are translated by mathematical probability tables into population numbers.

“MS” means mass spectrometry.

“mv” means millivolt or $\frac{1}{1000}$ of a volt.

“National Environmental Laboratory Accreditation Conference (NELAC)” means a voluntary organization of state and Federal environmental officials and interest groups purposed primarily to establish mutually acceptable standards for accrediting environmental laboratories.

“National Environmental Laboratory Accreditation Program (NELAP)” means the overall National Environmental Laboratory Accreditation Program of which NELAC is a part.

“National Primary Drinking Water Regulations” means the regulations promulgated by the USEPA at 40 CFR 141, together with all amendments and supplements.

“National Secondary Drinking Water Regulations” means the regulations promulgated by the USEPA at 40 CFR 143, together with all amendments and supplements.

“NELAC recognition” means the determination by the NELAP Director that an accrediting authority meets the requirements of the NELAP and is authorized to grant NELAP accreditation to laboratories.

“NELAC standards” means the plan of procedures for consistently evaluating and documenting the ability of laboratories performing environmental measurements to meet nationally defined standards established by the National Environmental Laboratory Accreditation Conference.

“New Jersey Pollutant Discharge Elimination System rules” or “NJPDES rules” means the rules promulgated by the Department at N.J.A.C. 7:14A, together with all amendments and supplements. The NJPDES rules govern the Department’s system for issuing, modifying, suspending, re-

voking and reissuing, terminating, monitoring, and enforcing discharge permits pursuant to the New Jersey Water Pollution Control Act.

“New Jersey Safe Drinking Water Act Regulations” means the regulations promulgated by the Department at N.J.A.C. 7:10, together with all amendments and supplements. The rules implement the New Jersey Safe Drinking Water Act, N.J.S.A. 58:12A-1 et seq.

“NIST” means the National Institute of Standards and Technology, formerly known as the National Bureau of Standards.

“NJWPCA” or “New Jersey Water Pollution Control Act” means N.J.S.A. 58:10A-1 et seq., together with all amendments and supplements.

“nm” means nanometer, one millionth of a millimeter, in the Metric System.

“N.M.A.T. (no measurable acute toxicity) definitive toxicity test” means, for acute toxicity testing, a short-term toxicity test designed to measure compliance with NJPDES permit limitations of “no measurable acute toxicity.”

“N.O.A.E.C. (no observed adverse effect concentration) definitive toxicity test” means, for acute toxicity testing, a short-term toxicity test designed to measure compliance with NJPDES permit limitations of “no observed adverse effect concentration.”

“Non-transient non-community water system” means a public water system that is not a community water system and that regularly serves at least 25 of the same persons over six months per year.

“Office of Quality Assurance” (OQA) means the office in the New Jersey Department of Environmental Protection that administers the Department Quality Assurance Program, the Environmental Laboratory Certification Program, and the State Contract Laboratory Program which includes the Analytical Services Contracts and Memoranda of Agreements for Analytical Services.

“On-site analyses” means the analysis of samples collected at a facility or a site of environmental concern, performed at that facility or environmental site.

“Parameter” means a general term that includes, but is not limited to, terms such as contaminant, constituent, substance, metal, organic chemical, and characteristics that are used to designate an analyte, group of analytes, attribute, or physical property for which a certified environmental laboratory may be approved to perform analysis of regulatory samples and report results.

“Performance evaluation sample” or “PE sample” means a sample containing a known concentration of one or more specific parameters, used to evaluate the analytical perfor-

mance of a laboratory. These materials may be provided by the USEPA, the Department, or other Department approved programs.

“Permit” means a NJPDES permit issued pursuant to the New Jersey Water Pollution Control Act, N.J.S.A. 58:10A-6.

“Person” means any individual or other entity, including without limitation, corporations, associations, partnerships, joint ventures, and the United States, any state, any foreign country or government, and any political subdivision or agency thereof.

“pH” means a numerical expression of the hydrogen ion concentration (acidity) of aqueous matrices. pH values range from 0 (high acidity-low alkalinity) to 7 (neutral), to 14 (low acidity-high alkalinity).

“Piper-1982” means, for acute toxicity testing, “Fish Hatchery Management,” by Piper et al., 1982, U.S. Fish and Wildlife Publication.

“Point source” means any discernible, confined, and discrete conveyance from a mobile or stationary source, including, but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete issue, container, rolling stock, concentrated animal feeding operation, vessel or other floating craft, from which pollutants are or may be discharged.

“Pollutant” means any dredge spoil, solid waste, incinerator residue, filter backwash, garbage, refuse, oil, grease, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials, thermal waste, wrecked or discarded equipment, and construction waste or runoff or other residue discharged to the land, groundwaters or surface waters of the state.

“Primary accrediting authority” means the agency or department designated at the territory, state, or Federal levels as the recognized authority with responsibility and accountability for granting NELAC accreditation for a specified field of testing.

“Primary standard” means a very pure reagent of defined purity used as a reference for standardizing other reagent solutions.

“Proficiency study” means an organized program in which laboratories participate in the analysis of PE sample aliquots from homogeneous sample batches. The PE samples contain one or more parameters monitored under a regulatory program, for example, the Drinking Water Program. Data from the study are analyzed statistically, so that the acceptability of individual laboratory results are based on the performance of participating laboratories.

“Public community water system” means a public water system which serves at least 15 service connections used by year-round residents or regularly serves at least 25 year-round residents.

“Public non-community water system” means a public water system that is not a community water system.

“Quality assurance” or “QA” means the integrated system of operations and measurements performed to assure that data meets defined standards of quality with a stated level of confidence.

“Quality control” or “QC” means the practice of standardized operations or measurements which determine one or more aspects of data quality. An example is the evaluation of precision and accuracy data of an analytical method by statistical methods for the purpose of establishing control limits within which future precision and accuracy data must fall.

“Radon” means the radioactive noble gas radon-222.

“Radon Act” means N.J.S.A. 26:2D-70 et seq.

“Radon progeny-in-air” means the short-lived radionuclides formed as a result of the decay of radon-222. The short-lived radon progeny consist of polonium-218, lead-214, bismuth-214 and polonium-214.

“Radon/Radon Progeny-in-Air Program” means the Department’s program implementing the portion of the Radiation Protection Act governing radon and radon progeny, N.J.S.A. 26:2D-70 et seq.

“Range-finding toxicity test” means, for acute toxicity testing, a short-term (usually 24 hours), small-scale test to determine the approximate concentration range to be covered in full-scale definitive testing. This is especially useful with effluents or materials of unknown toxicity.

“Raw data” means the data generated during the sample preparation and analysis. The data includes analyst notebook entries, bench sheets, standards preparation, instrument calibration, method QC, strip chart graphs, computer printouts, and integrator printouts.

“Reagent water” means water used for chemical testing that meets the specifications of Type I (or better) and Type II (or better) reagent waters as defined in the current version of ASTM D1193. Type I reagent water is required for inorganics analysis. Type II reagent water is required for organics analysis and sampling equipment decontamination.

“Reciprocal” means by mutual agreement of two or more states to accept each other’s findings regarding the ability of environmental testing laboratories in meeting NELAC standards.

“Recognition” means the determination that an accrediting authority meets the requirements of the NELAP and is authorized to grant NELAP accreditation to laboratories.

“Record” means all information and data recorded and/or stored on paper, microfilm/microfiche or computer systems.

“Regulatory program” means any of the statutes listed in N.J.A.C. 7:18-1.1(c), any regulations or orders issued pursuant to those statutes, or the Contract Laboratory Program.

“Regulatory purposes” means for the purpose of determining compliance with a regulatory program.

“Regulatory sample” means either of the following:

1. A sample taken and/or analyzed to comply with a regulatory program; or
2. A proficiency evaluation (PE) sample.

“Renewal toxicity test” means, for acute toxicity testing, a static test with periodic exposure (at least once every 24 hours) of the test organisms to a fresh test solution of the same concentration. This is accomplished either by transferring the test organisms or replacing the test solution.

“Replicate sample” means a sample prepared by dividing a homogeneous sample into separate parts so that each part is also homogeneous and representative of the original sample.

“Response” means, for acute toxicity testing, the observed biological effect of the material tested. In acute toxicity tests, the observed effect is usually death.

“Safe Drinking Water Act” or “NJSDWA” means N.J.S.A. 58:12A-1 et seq.

“Salinity” means, for acute toxicity testing, the total amount of dissolved salts in sea water expressed in parts per thousand (ppt) by weight when all the carbonate has been converted to oxide, the bromide and iodide have been replaced with chloride, and all organic matter has been completely oxidized.

“Sample handling and preservation” means those sample handling and preservation techniques listed in N.J.A.C. 7:18-9. These techniques comprise the Department’s minimum performance requirements for handling and preserving a valid sample for subsequent analysis by a certified environmental laboratory for regulatory purposes.

“Sampling point” means a particular site whose location may be specified in a permit, or otherwise, and from which samples are to be collected for testing and evaluation.

“SM14” or “Standard Methods, 14th Edition” means “Standard Methods for the Examination of Water and Wastewater,” American Public Health Association, 14th Edition, 1975.

“SM15” or “Standard Methods, 15th Edition” means “Standard Methods for the Examination of Water and

Wastewater,” American Public Health Association, 15th Edition, 1980.

“SM16” or “Standard Methods, 16th Edition” means “Standard Methods for the Examination of Water and Wastewater,” American Public Health Association, 16th Edition, 1985.

“SM17” or “Standard Methods, 17th Edition” means “Standard Methods for the Examination of Water and Wastewater,” American Public Health Association, 17th Edition, 1989.

“SM18” or “Standard Methods, 18th Edition” means “Standard Methods for the Examination of Water and Wastewater,” American Public Health Association, 18th Edition, 1992.

“SOC” means a synthetic organic chemical listed in the National Primary Drinking Water Regulations. An SOC is a non-volatile organic compound for which maximum contaminant levels (MCLs) or maximum contaminant level goals (MCLGs) have been established.

“Solid/Hazardous Waste Programs” means the Department’s programs implementing the Solid Waste Management Act, N.J.S.A. 13:1E-1 et seq., the Industrial Site Recovery Act, N.J.S.A. 13:1K-6 et seq., and the Spill Compensation and Control Act, N.J.S.A. 58:10-23.11 et seq.

“Solid/hazardous waste sample” means a regulatory sample analyzed to determine compliance with one or more of the Solid/Hazardous Waste Programs.

“SOP manual” means standard operating procedure manual. This manual includes step-by-step instructions for all procedures, operations, analyses, and actions whose mechanics are thoroughly prescribed and commonly accepted as the usual method for performing routine or repetitive tasks.

“State Primary Drinking Water Regulations” means those regulations promulgated as N.J.A.C. 7:10-5.

“State Secondary Drinking Water Regulations” means those regulations promulgated as N.J.A.C. 7:10-7.

“Static-toxicity test” means, for Acute toxicity testing, a test in which solutions and organisms are placed in chambers for the duration of the test without any exchange of the test solutions.

“Subsample” means a portion of a large volume homogenized sample.

“Subsequent to graduation” means the time after receipt of a specified degree.

“SW-846” means the USEPA’s Test Methods for Evaluating Solid Waste—Physical and Chemical Methods, Third Edition, 1986, as amended or supplemented.

“Target compound” means any parameter for which quality control data are listed in the method.

“Technique” means the type of instrumental or manual procedure used to perform an analysis. For example, the potentiometric ion selective electrode determination of fluoride is one of four techniques used for the determination of fluoride in drinking water. There are three method references approved by USEPA that use this technique.

“Temporary approval” means either of the following:

1. A temporary approval for a laboratory to continue analyzing regulatory samples pending an on-site audit pursuant to N.J.A.C. 7:18-2.6(a)6; or
2. A temporary approval for a laboratory to continue analyzing regulatory samples for one or more categories in the solid/hazardous waste programs, pursuant to N.J.A.C. 7:18-2.6(c).

“Total length” means, for acute toxicity testing, the straight-line measurement from the tip of the snout of a fish to the extreme tip of the caudal fin.

“Toxicity test” means, for acute toxicity testing, a procedure in which the responses of aquatic organisms are used to detect or measure the presence or effect of one or more toxic substances or wastes, alone or in combination.

“Transient non-community water system” means a non-community water system that does not regularly serve at least 25 of the same persons over 6 months per year.

“Transport water” means, for acute toxicity testing, the fresh or salt water used to transport test organisms from an outside supplier’s facility to the certified environmental laboratory; usually it is the water used by the supplier for culturing test organisms.

“Trip blanks” means a set of sample containers filled with analyte-free water that originates in the environmental laboratory, travels to the field site and remains unopened. This blank checks for potential contamination sources in sample container preparation, method blank water, and sample transport.

“USEPA” or “EPA” means the United States Environmental Protection Agency.

“USEPA-1987” means, for acute toxicity testing, “Guidelines for the Culture of Fathead Minnows Pimephales Promelas for Use In Toxicity Tests,” USEPA, Environmental Research Laboratory, Duluth, MN, USEPA/600/3-87/001, January, 1987.

“USGS-83” means “Methods for the Determination of Organic Substances in Water and Fluvial Sediments,” Book 5, 1983.

“USGS-76” means Fishman and Brown, “Selected Methods of the U.S. Geological Survey of Analysis of Wastewater,” Open-file Report 76-177 (1976).

“VOCs” means volatile organic chemicals as listed in the National Primary Drinking Water Regulations. These are a group of purgeable organic compounds for which maximum contaminant levels (MCLs) or maximum contaminant level goals (MCLGs) have been established.

“Volatile organics” means those organic compounds that can be determined quantitatively by methods utilizing the purge and trap technique. VOCs are a subset of volatile organics.

“Volume Percent” means, for acute toxicity testing, equal to $100 \times (\text{volume of effluent}) / (\text{volume of effluent} + \text{volume of dilution water})$.

“Warm-water fishes” means, for acute toxicity testing, those species living and breeding in aquatic ecosystems with a maximum water temperature range of between 13 degrees Celsius and 27 degrees Celsius.

“Wastewater sample” means a regulatory sample analyzed to determine compliance with the Water Pollution Program.

“Water Pollution Program” means the Department’s program implementing the Water Pollution Control Act, N.J.S.A. 58:10A-1 et seq.

“Water purveyor” means a person who owns or operates a public water system (as that term is defined in N.J.A.C. 7:10-1.3).

“Waters of the State” means the Atlantic Ocean and its estuaries, all springs, streams, and bodies of surface or ground water, whether natural or artificial, within the boundaries of this State or subject to its jurisdiction.

“Weis-1979” means, for acute toxicity testing, “Establishment of a Statewide List of Bioassay Organisms Pursuant to the New Jersey Surface Water Quality Standards,” Judith S. Weis, Edmund Zimmerer, John Galandak, and Allen Marchinsin; Department of Zoology and Physiology, Rutgers, The State University; Revised March, 1979.

“Wide spectrum light” means light that approximates natural sunlight.

“Working level (WL)” means the concentration of short-lived radon decay products that will result in 130,000 million electron volts of potential alpha-particle energy per liter of air. Working level is a measure of radon decay product concentration in air.

“Year class” means, for acute toxicity testing, fish that originate from the same annual brood or spawning.

Administrative change.

See: 28 N.J.R. 4098(a).

Amended by R.1997 d.192, effective May 19, 1997.

See: 28 N.J.R. 4149(a), 29 N.J.R. 2275(a).

Added “N.O.A.E.C. (no observed adverse effort concentration) definitive toxicity test”.

Amended by R.2001 d.15, effective January 2, 2001.

See: 32 N.J.R. 1113(a), 33 N.J.R. 44(a).

Rewrote section.

Amended by R.2001 d.345, effective September 17, 2001.

See: 33 N.J.R. 1284(a), 33 N.J.R. 3351(a).

Amended “ANSP—Goulden”, “ASTM D 4229-84”, “ASTM E 724-80”, “ASTM E 729-80”, “Chronic toxicity”, “Criteria—1986” and “Laboratory grade water”.

7:18-1.8 Severability

If any portion of this chapter is adjudged unconstitutional or invalid by a court of competent jurisdiction, the remainder of this chapter shall not be affected by that adjudication.

7:18-1.9 Signatories

(a) In each application for an initial certification, renewal certification or modification of a certification, the applicant shall include the following certification, signed by the individual specified in (b) below:

1. “I certify under penalty of law that I have personally examined and am familiar with the information submitted in this application and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant civil and criminal penalties, including the possibility of a fine or imprisonment or both, for submitting false, inaccurate, or incomplete information.”

(b) The following individual shall sign the certification required under (a) above:

1. If the applicant is a corporation, a principal executive officer of at least the level of vice president;
2. If the applicant is a partnership, a general partner;
3. If the applicant is a sole proprietorship, by the proprietor;
4. If the applicant is a municipal, state, Federal or other public agency or instrumentality, by the principal executive officer or his or her designee.

SUBCHAPTER 2. PROGRAM PROCEDURES AND REQUIREMENTS

7:18-2.1 Scope

(a) This subchapter establishes the following:

1. The procedure for becoming a certified environmental laboratory;
2. Requirements that a laboratory must meet to become a certified environmental laboratory;
3. The categories of analysis for which certification is available;
4. The procedure for a certified environmental laboratory to renew or modify its certification;
5. Procedures for cancellation, suspension, and revocation of certification;
6. The procedures to apply for approval of alternate test procedures; and
7. Fees for certification.

7:18-2.2 General prohibitions

(a) No laboratory other than a certified environmental laboratory shall analyze samples for the purpose of establishing compliance with any regulatory program.

(b) A certified environmental laboratory shall use only the methods listed on its Annual Certified Parameter List when analyzing samples for the purpose of establishing compliance with any regulatory program.

(c) Only a certified environmental laboratory may use the name “certified environmental laboratory” or any other name that is reasonably likely to lead the public to believe that a laboratory or other person is a certified environmental laboratory. Any laboratory or other person who is not a certified environmental laboratory shall not make an oral or written statement intended to mislead the public into believing that the laboratory or other person is a certified environmental laboratory.

7:18-2.3 Overview of the certification process

(a) A laboratory is eligible to become a certified environmental laboratory only if it completes the application requirements at N.J.A.C. 7:18-2.5, and demonstrates through the process set forth within this subchapter that it complies with the requirements in N.J.A.C. 7:18-2.6(a).

(b) If the Department determines that an applicant satisfies the requirements of (a) above, the Department shall issue the applicant a certificate and an Annual Certified Parameter List (ACLP) showing the parameters, techniques, method references, and corresponding methods for which the applicant is certified.

(c) The Department’s annual certification period begins on July 1 of each year, and ends on the following June 30. A certification and an Annual Certified Parameter List expire at the end of the annual certification period for which they are issued, unless they are renewed in accordance with N.J.A.C. 7:18-2.7. The Annual Certified Parameter List shall indicate the certification period for which it is valid.

7:18-2.4 Categories for certification

(a) An applicant shall apply for certification to perform methods for use in one or more of the following regulatory programs:

1. Drinking Water Program;
2. Water Pollution Program;
3. Radon/Radon Progeny-in-Air Program;
4. Solid/Hazardous Waste Programs; and
5. CERCLA (CLP) Program.

(b) An applicant shall apply for certification to perform sample analysis and to report results for one or more parameters within one or more categories listed in (c) through (g) below.

(c) The parameters for which a laboratory may be certified to perform sample analysis and to report results for purposes of determining compliance with the Drinking Water Program are organized within the following categories:

1. Category SDW01, Microbiological Parameters;
2. Category SDW02, Inorganic Parameters, including Sodium & Calcium;
3. Category SDW03, Analyze-Immediately Parameters;
4. Category SDW04, Inorganic Parameters, Metals;
5. Category SDW05, Organic Parameters, Chromatography;
6. Category SDW06, Organic Parameters, Chromatography/Mass Spectrometry;
7. Category SDW07, Radiochemistry: Radioactivity & Radionuclide Parameters; and
8. Category SDW08, Radon in Drinking Water.

(d) The parameters for which a laboratory may be certified to perform sample analysis and to report results for purposes of determining compliance with the Water Pollution Program are organized within the following categories:

1. Category WPP01, Microbiological Parameters;
2. Category WPP02, Inorganic Parameters, Nutrients & Demand;
3. Category WPP03, Analyze-Immediately Parameters;
4. Category WPP04, Inorganic Parameters, Metals;
5. Category WPP05, Organic Parameters, Chromatography;
6. Category WPP06, Organic Parameters, Chromatography/ Mass Spectrometry;

7. Category WPP07, Individual Pesticides (GC, GC/MS, TLC);

8. Category WPP08: Toxicity Testing;

9. Category WPP09, Radiochemistry: Radioactivity & Radionuclide Parameters; and

10. Category WPP10, Radon in Wastewater.

(e) The parameters for which a laboratory may be certified to perform sample analysis and to report results for purposes of determining compliance with the Radon/Radon Progeny-in-Air Program are organized within the following category: Category RAP01, Radon/Radon Progeny-in-Air.

(f) The parameters for which a laboratory may be certified to perform sample analysis and to report results for purposes of determining compliance with the Solid/Hazardous Waste Program are organized within the following categories:

1. Category SHW01, Microbiological Parameters;
2. Category SHW02, Characteristics of Hazardous Waste;
3. Category SHW03, Analyze-Immediately Parameters;
4. Category SHW04, Inorganic Parameters;
5. Category SHW05, Organic Parameters, Preparation & Screening;
6. Category SHW06, Organic Parameters, Chromatography;
7. Category SHW07, Organic Parameters, Chromatography/Mass Spectrometry;
8. Category SHW08, Polychlorinated Dibenzo-p-dioxins and Polychlorinated Dibenzofurans;
9. Category SHW09, Miscellaneous Parameters;
10. Category SHW10, Facility-Specific Parameters;
11. Category SHW11, Incinerator Emissions; and
12. Category SHW12, Immunoassay.

(g) The parameters for which a laboratory may be certified to perform sample analysis and to report results for purposes of determining compliance with the CERCLA (CLP) Program are organized within the following categories:

1. Category CLP01, Multi-Media, Multi-Concentration Inorganic Parameters;
2. Category CLP02, Multi-Media, Multi-Concentration Organic Parameters;
3. Category CLP03, Polychlorinated Dibenzo-p-dioxins & Polychlorinated Dibenzofurans;

- 4. Category CLP04, Multi-Media, High Concentration Inorganic Parameters;
- 5. Category CLP05, Multi-Media, High Concentration Organic Parameters;
- 6. Category CLP06, Low Concentration Water for Inorganic Parameters; and
- 7. Category CLP07, Low Concentration Water for Organic Parameters.

Administrative change.
 See: 28 N.J.R. 4098(a).
 Amended by R.2001 d.15, effective January 2, 2001.
 See: 32 N.J.R. 1113(a), 33 N.J.R. 44(a).
 Added (i) through (k).
 Amended by R.2001 d.224, effective July 2, 2001.
 See: 33 N.J.R. 1063(a), 33 N.J.R. 2284(c).
 In (c) through (h), amended categories.
 Amended by R.2001 d.345, effective September 17, 2001.
 See: 33 N.J.R. 1284(a), 33 N.J.R. 3351(a).
 In (d)8 and (h) Table 2.1, substituted "Toxicity Testing" for "Acute Toxicity".

(h) Table 2.1 illustrates the organization of subchapters 3 through 9 (N.J.A.C. 7:18-3 through 9).

Table 2.1 Organization of Subchapters 3 through 9

Subchapter	Title	Categories
3	General Laboratory Facilities & Equipment	All categories except
4	Microbiology	SDW03, WPP03, SHW03
5	Chemistry	SDW01, WPP01, SHW01
		SDW02, SDW04-SDW06, WPP02, WPP04-WPP07, SHW02, SHW04-SHW12, CLP01-CLP07
6	Radiochemistry & Radon/Radon Progeny-in-Air	SDW07, SDW08, WPP09, WPP10, RAP01
7	Toxicity Testing	WPP08
8	Analyze Immediately	SDW03, WPP03, SHW03
9	Sample Requirements	All

(i) An out-of-State laboratory, which has received NELAP accreditation from a state that has received NELAP recognition, shall be eligible for reciprocal accreditation to perform environmental sample analyses in accordance with (a) through (h) above, provided:

- 1. The laboratory is NELAP accredited by a state recognized as a NELAP accrediting authority for those fields of testing in which the laboratory is requesting accreditation pursuant to this subsection;
- 2. The laboratory submits to the Department an application on the form specified in N.J.A.C. 7:18-2.5; and
- 3. When requested by the Department, laboratory submits a copy of the laboratory's most recent (no more than two years old) NELAP on-site assessment reports.

(j) If, upon review of the documents listed in (i)2 and 3 above, the Department determines that the methods used by the out-of-State laboratory are equivalent to the requirements of this chapter, the Department shall not require an on-site survey by its inspectors and certification shall be granted after the assessed certification fees are paid (see N.J.A.C. 7:18-2.9, Fees).

(k) If, upon review of the documents listed in (i)2 and 3 above, the Department is unable to determine that the out-of-State laboratory has met the requirements of this chapter, then the Department shall contact the NELAP-primary accrediting authority and request that it conduct an on-site inspection of the laboratory.

7:18-2.5 Procedure for initial application of a laboratory seeking certification

(a) A laboratory seeking initial certification for one or more parameters in any category listed in N.J.A.C. 7:18-2.4(c) through (g) shall submit an application to the Department, at the address listed in N.J.A.C. 7:18-1.6(a).

(b) The applicant shall complete the application form supplied by the Department, including the following:

- 1. The name of the applicant;
- 2. The mailing address and, if different, street address and municipality of laboratory location;
- 3. The hours of operation;
- 4. The areas in which certification is sought;
 - i. Regulatory programs;
 - ii. Categories;
 - iii. Parameters;
 - iv. Techniques; and
 - v. Method references and specific method numbers. A laboratory shall select only one or more method reference and corresponding method when multiple method references for a given technique are included in the DSAMs;
- 5. The type of environmental laboratory, identified by code listed on the application form;
- 6. The names of the following individuals:
 - i. The applicant's owner;
 - ii. The individual designated as the manager pursuant to N.J.A.C. 7:18-2.10(a)1; and
 - iii. All supervisors designated pursuant to N.J.A.C. 7:18-2.10(a)2;
- 7. A description of the education and experience of the following individuals, and academic transcripts for each such individual:
 - i. The manager, if responsible for technical functions;
 - ii. All supervisors; and
 - iii. Other laboratory technical staff;

8. If the applicant has participated in the USEPA Proficiency Testing Program and/or any Department-authorized proficiency program during the 12 months immediately preceding the application, the applicant may submit the results of such proficiency testing for any parameters for which the applicant is seeking certification;

9. The certification required under N.J.A.C. 7:18-1.9(a)1, signed by the individual required under N.J.A.C. 7:18-1.9(b);

10. If the laboratory is applying for certification in any of the categories listed in N.J.A.C. 7:18-5.1(a) for which published MDLs are available, MDL data for such methods;

11. Any other information included on the form, which is reasonably necessary to enable the Department to determine whether the applicant should be certified; and

12. The appropriate fees, pursuant to N.J.A.C. 7:18-2.9, in the form of a check payable to "Treasurer, State of New Jersey."

(c) An application is administratively complete if it contains everything required under (b) above. The Department shall advise the applicant in writing whether the application is administratively complete. If the application is not administratively complete, the Department shall identify the deficiencies. A determination that the application is administratively complete does not authorize the laboratory to perform sample handling, preservation, and analyses and reporting of data as regulated by this chapter.

(d) In addition to the information required under (b) above, the applicant shall provide any information that the Department requests as being reasonably necessary to determine whether the applicant should be certified.

Administrative change.
See: 28 N.J.R. 4098(a).

7:18-2.6 Conditions for the granting of certification

(a) To be eligible for certification, an applicant shall satisfy all of the requirements listed in (a)1 through 8 below:

1. The applicant has submitted a complete application meeting the requirements of N.J.A.C. 7:18-2.5(b), including the fees required under N.J.A.C. 7:18-2.9;

2. The applicant is capable of providing accurate, precise and reliable data in accordance with the mandates of State and Federal law and regulation;

3. The applicant possesses facilities, instruments, and equipment that meet the technical specifications required by the analytical methods, and that are properly maintained and operated;

4. The applicant's staff has the formal education, training and experience required under N.J.A.C. 7:18-2.10;

5. The applicant satisfies all applicable proficiency testing requirements under N.J.A.C. 7:18-2.13, including, but not limited to, acceptably analyzing any and all PE samples for each parameter within each category for which certification is sought;

6. The applicant satisfies the requirements for on-site audits under N.J.A.C. 7:18-2.14, including, but not limited to, the requirement to correct deficiencies identified by the Department in the on-site audit. If the applicant is seeking certification for radiochemistry: radioactivity and radionuclide testing, radon, and radon/radon progeny in air, and the Department is unable to schedule an on-site audit within 90 days after receiving an administratively complete application, the Department may grant temporary approval to a laboratory to analyze radiochemical samples, excluding radon/radon progeny-in-air, until the Department performs the on-site audit. If the Department grants temporary approval, the applicant shall continue to participate in the USEPA's proficiency testing program and acceptably analyze the program's samples;

7. The applicant completes its analysis of PE samples and all other requirements for certification within the time specified by the Department; and

8. The applicant complies with all other requirements of this chapter relevant to certification, and demonstrates that it is capable of complying with the relevant technical standards of performance found in N.J.A.C. 7:18-3 through 9.

(b) If the Department determines that an applicant is eligible for certification under (a) above, the Department shall issue the applicant a certificate and an Annual Certified Parameter List. The Department shall include the following information in the Annual Certified Parameter List:

1. The regulatory programs in which the environmental laboratory is certified to perform sample analysis and to report results to the Department;

2. For each regulatory program listed in (b)1 above, the specific parameters for which the environmental laboratory has demonstrated competence; and

3. The analytical technique, method reference and corresponding method number for which the environmental laboratory is certified.

(c) For categories SHW01 through SHW12 and CLP01 through CLP07, a phase-in period may be available during which a laboratory may continue to analyze regulatory samples by methods not included in the laboratory certification program prior to adoption of this chapter. To qualify for the phase-in period, the laboratory shall satisfy the requirements listed in (c)1 and 2 below.

1. By (date that is 180 days after the operative date of these new rules), the laboratory shall submit an administratively complete application to the Department pursuant to N.J.A.C. 7:18-2.5. When the Department determines that the application is administratively complete, it will provide the laboratory with temporary approval to analyze regulatory samples. The laboratory may continue analyzing regulatory samples while the temporary approval is in effect. The approval shall remain in effect until one of the following occurs:

- i. The Department issues a certification and Annual Certified Parameter List pursuant to (b) above;
- ii. The laboratory fails to satisfy the requirements for certification within the time specified in (c)2 below; or
- iii. The Department denies the certification.

2. Within one year after submitting the application under (c)1 above, the environmental laboratory shall satisfy all other requirements for certification under (a) above. If the environmental laboratory satisfies all of these requirements except the requirement for an on-site audit, and the on-site audit requirement has not been satisfied because the Department has not scheduled the audit, the temporary approval shall remain in effect until an event listed in (c)1i or 1iii occurs.

3. If a laboratory fails to submit an administratively complete application within the time allotted under (c)1 above, or if the temporary approval expires under (c)1i or 1iii above, the phase-in period is forfeited. The laboratory shall discontinue all regulatory sampling and analysis for categories SHW01 through SHW12 and CLP01 through CLP07. Thereafter the laboratory shall follow the regular procedure for obtaining certification in accordance with N.J.A.C. 7:18-2.5.

Amended by R.2001 d.224, effective July 2, 2001.

See: 33 N.J.R. 1063(a), 33 N.J.R. 2284(c).

In (c), amended categories in the introductory paragraph and in 3.

7:18-2.7 Procedures for renewal of certification status for a certified environmental laboratory

(a) Each certified environmental laboratory and each laboratory holding temporary approval shall follow the following procedure to renew its certification every certification year:

- 1. The laboratory shall obtain a renewal application form from the Department.
- 2. The laboratory shall review the information provided by the Department on the renewal application form. On the form, the laboratory shall correct any inaccurate or incomplete information, advise the Department of any changes in personnel or equipment, and indicate any desired modifications.

3. The laboratory shall submit the renewal application to the Department at the address listed in N.J.A.C. 7:18-1.6(a). When submitting the renewal application, the laboratory shall include the renewal application form provided by the Department, the fees required under N.J.A.C. 7:18-2.9, and the certification required under N.J.A.C. 7:18-1.9.

4. The laboratory shall submit the renewal application with the required fees by March 31 of each year. However, if the Department has not made the renewal application forms available by March 1, the deadline for submitting the renewal application shall be extended by one day for each day beyond March 1 that the forms are unavailable. For example, if the Department does not make the forms available until March 15, the deadline for submitting the renewal application shall be April 14.

5. A laboratory may submit a late renewal application after the deadline established under (a)4 above. However, if a late renewal application is submitted, the renewal may not be completed before the June 30 expiration date of the certification or temporary approval.

(b) If a laboratory's certification or temporary approval is not renewed before its expiration date, the certification or temporary approval and the Annual Certified Parameter List (if any) shall expire. If a laboratory's certification, temporary approval or ACPL expires, any analysis performed by that laboratory does not establish compliance with any regulatory program.

(c) A laboratory shall not submit a renewal application after the June 30 expiration date. If a laboratory fails to submit a renewal application before the expiration date, the laboratory's certification, temporary approval and ACPL (if any) shall expire. Any environmental laboratory allowing its certification to expire shall apply for a new certification by filing an initial application in accordance with N.J.A.C. 7:18-2.5.

Administrative change.
See: 28 N.J.R. 4098(a).

7:18-2.8 Procedure for modification of certification status by the addition or deletion of parameters, categories and/or combined categories

(a) A certified environmental laboratory seeking to modify its certification, or a laboratory seeking to modify its application for certification under N.J.A.C. 7:18-2.5, shall submit an application to the Department at the address specified in N.J.A.C. 7:18-2.5(a). In the application, the laboratory shall include the following:

- 1. Any changes that the laboratory seeks to make in the areas for which it is certified or has applied to be certified, including all information required under N.J.A.C. 7:18-2.5(b)4;
- 2. Information required under N.J.A.C. 7:18-2.5(b)6 and 7, with respect to any additional personnel needed for

additional areas of certification pursuant to N.J.A.C. 7:18-2.10;

3. Information required under N.J.A.C. 7:18-2.5(b)8, if applicable to the modification;

4. The certification required under N.J.A.C. 7:18-1.9(a), signed by the person required under N.J.A.C. 7:18-1.9(b); and

5. The fees required under N.J.A.C. 7:18-2.9, in the form of a check payable to "Treasurer, State of New Jersey." However, if the modification is part of a renewal application under N.J.A.C. 7:18-2.7(b), then the laboratory need not pay the fee for "Administrative Activities—Request for modification in certified, applied or interim approval status."

(b) Before approving the modification, the Department may require proficiency testing pursuant to N.J.A.C. 7:18-2.13 and/or an on-site audit pursuant to N.J.A.C. 7:18-2.14. The Department shall base its decision to require proficiency testing and/or an on-site audit upon the degree of competence and compliance with this chapter that the environmental laboratory has demonstrated through previous proficiency testing and on-site audits.

(c) The Department shall approve the modification only if the laboratory satisfies all of the requirements under N.J.A.C. 7:18-2.6(a) that are applicable to the modification.

(d) Subsections (a) through (c) above do not apply to a modification to delete one or more parameters or categories from a laboratory's certification. No payment of a fee or Department approval is required to delete a parameter or category. To delete one or more parameters or categories, the laboratory shall send written notification to the Department at the address specified in N.J.A.C. 7:18-1.6(a), by certified mail or other means that provides a receipt for delivery; provided however, that the laboratory may instead provide this written notification as part of a renewal application under N.J.A.C. 7:18-2.7. The deletion shall be effective upon the Department's receipt of the notice.

7:18-2.9 Fees

(a) A laboratory applying for an initial or renewal certification or for modification of a certification shall include with the application the fees required under this section. Fees are not refundable.

(b) The fee schedule is set forth below. To calculate the fee for a given service, add the fee for the administrative activity and the fee for each category affected by the application. For example, if a laboratory seeks an initial certification in category SDW01, the fee would be the sum of \$825.00 (the administrative activity fee) and \$206.00 (the category fee), for a total of \$1,031.

Environmental Laboratory Application

<u>Change-of-Status and Certification Categories</u>		<u>Fees</u>
I.	Administrative Activities	
	Initial Application Fee For Certification	\$825
	Renewal Application Fee For Certification	\$295
	Request for modification in certified, applied or interim approval status	\$236
	Alternate Test Procedure application	\$118
	Alternate Test Procedure Evaluation	\$2,004
II.	Drinking Water Program Categories (SDW01-SDW08)	
	SDW01 Microbiological Parameters	\$206
	SDW02 Inorganic Parameters including Sodium and Calcium	\$236
	SDW03 Analyze-Immediately Inorganic Parameters	\$118
	SDW04 Inorganic Parameters, Metals	\$118
	SDW05 Organic Parameters, Chromatography	\$206
	SDW06 Organic Parameters, Chromatography/Mass Spectrometry	\$265
	SDW07 Radiochemistry: Radioactivity and Radionuclide Parameters	\$354
	SDW08 Radon in Drinking Water	\$177
III.	Water Pollution Program Categories (WPP01-WPP10)	
	WPP01 Microbiological Parameters	\$206
	WPP02 Inorganic Parameters, Nutrients and Demand	\$236
	WPP03 Analyze-Immediately Inorganic Parameters (Including Continuous Monitoring)	\$118
	WPP04 Inorganic Parameters, Metals	\$118
	WPP05 Organic Parameters, Chromatography	\$147
	WPP06 Organic Parameters, Chromatography/Mass Spectrometry	\$265
	WPP07 Organic Parameters, Individual Pesticides (GC, GC/MS, TLC)	\$177
	WPP08 Toxicity Testing Parameters	\$2,240
	WPP09 Radiochemistry: Radioactivity and Radionuclide Parameters	\$354
	WPP10 Radon in Wastewater	\$177
IV.	Radon/Radon Progeny-in-Air Program Category (RAP01)	
	RAP01 Radon/Radon Progeny-in-Air	\$236
V.	Solid/Hazardous Waste Categories (SHW01-SHW12)	
	SHW01 Microbiological Parameters (SW/HW)	\$206
	SHW02 Characteristics of Hazardous Waste (SW/HW)	\$177
	SHW03 Analyze-Immediately Parameters (SW/HW)	\$118
	SHW04 Inorganic Parameters (SW/HW)	\$147
	SHW05 Organic Parameters, Preparation and Screening (SW/HW)	\$118
	SHW06 Organic Parameters, Chromatography (SW/HW)	\$236
	SHW07 Organic Parameters, Chromatography/Mass Spectrometry (SW/HW)	\$206
	SHW08 Polychlorinated Dibenzo-p-dioxins and Polychlorinated Dibenzofurans(SW/HW)	\$236
	SHW09 Miscellaneous Parameters (SW/HW)	\$177
	SHW10 Facility-Specific Parameters (SW/HW)	\$1,061
	SHW11 Incinerator Emissions (SW/HW)	\$236
	SHW12 Immunoassay	\$118
VI.	CERCLA-CLP Categories (CLP01-CLP07)	
	CLP01 Multi-Media, Multi-Concentration Inorganics (CERCLA-CLP)	\$147
	CLP02 Multi-Media, Multi-Concentration Organics (CERCLA-CLP)	\$383
	CLP03 Polychlorinated Dibenzo-p-dioxins and Polychlorinated Dibenzofurans (CERCLA-CLP)	\$236
	CLP04 Multi-Media, High-Concentration Inorganics (CERCLA-CLP)	\$177
	CLP05 Multi-Media, High-Concentration Organics (CERCLA-CLP)	\$118
	CLP06 Low-Concentration Water for Inorganics (CERCLA-CLP)	\$177

Change-of-Status and Certification Categories		Fees
CLP07	Low-Concentration Water for Organics (CERCLA-CLP)	\$236

(c) If a laboratory seeks to modify its certification as part of a renewal application under N.J.A.C. 7:18-2.7(b), the laboratory need not pay the fee for “Administrative Activities—Request for modification in certified, applied or interim approval status.” The fee shall be the sum of the following:

1. The fee for “Administrative Activities—Renewal Application Fee for Certification”; and
2. The fee for each category for which the laboratory seeks to renew certification, or seeks to add certification. If the laboratory seeks to delete a category from its certification, the fee for that category shall not be included in the total fee.

(d) If a laboratory’s application for certification is pending as of July 1 in a given year and it has not completed all of the requirements for certification by that date, the laboratory shall pay the Administrative Activities—Renewal Application Fee described in (b) above by July 1, but is not required to pay the fee for the category or categories in which certification is pending. If the laboratory becomes certified in such a category after July 1, it shall pay the fee for the category, prorated for the number of months (including any part of a month) remaining until the following July 1. The laboratory shall pay this fee within 30 days after the laboratory becomes certified. For example, if a laboratory applies for certification in Category SDW01 on October 1, 1996, but does not become certified in that category until September 15, 1997, it shall pay fees as follows:

1. On October 1, 1996, \$825.00 for the initial application fee and \$206.00 for the category;
2. On July 1, 1997, \$295.00 for the renewal application fee; and
3. Within 30 days after September 15, 1997, \$172.00 representing the \$206.00 category fee pro-rated for 10 months.

(e) Environmental laboratories applying for or renewing certification in the following combined categories are eligible for a reduced fee:

1. Microbiological parameters, Categories SDW01, WPP01, and/or SHW01: \$295.00.
2. Inorganic parameters, Analyze-Immediately Categories SDW03, WPP03, and/or SHW03: \$118.00.
3. Inorganic parameters, Metal Categories SDW04, WPP04, and/or SHW04: \$147.00.
4. Radon in Water, Categories SDW08 and WPP10: \$177.00.

(f) If the Department conducts an on-site audit of an out-of-State environmental laboratory, the Department shall

provide the laboratory with an invoice specifying the costs of overnight travel, room and board, miscellaneous expenses of the Department certification inspectors, and (for environmental laboratories located outside the United States) expenses resulting from foreign currency exchanges. Within 60 calendar days after the date of the invoice, the laboratory shall remit to the Department the fee specified on the invoice.

(g) If the Department purchases PE samples to send to a laboratory for use in the proficiency testing program, the Department shall provide the laboratory with an invoice stating the actual cost paid to purchase the samples. Within 60 calendar days after the date of the invoice, the laboratory shall remit to the Department the amount specified on the invoice.

Amended by R.2001 d.224, effective July 2, 2001.

See: 33 N.J.R. 1063(a), 33 N.J.R. 2284(c).

In (b), (d) and (e), amended categories.

Amended by R.2001 d.345, effective September 17, 2001.

See: 33 N.J.R. 1284(a), 33 N.J.R. 3351(a).

In (b)III WP08, substituted reference to Toxicity Testing Parameters for Acute Toxicity Parameters.

Administrative correction.

See: 34 N.J.R. 1668(a).

7:18-2.10 Environmental laboratory personnel requirements

(a) A certified environmental laboratory shall employ qualified personnel who possess the education, training, and experience required under this section. The laboratory shall maintain current employee records that include a resume and college transcript documenting each employee’s training, experience, duties, and dates of relevant employment. The laboratory shall include at least the following personnel:

1. An environmental laboratory manager, who shall be the individual in responsible charge of the laboratory;
2. One or more supervisors, who shall be qualified in accordance with the applicable provisions of (b) below to perform the tests and analyses within the Category or Categories for which the environmental laboratory is certified, or seeks certification. The environmental laboratory manager may also serve as a supervisor provided that the manager meets the qualifications for supervisor;
3. A Quality Assurance (QA) Officer. For a laboratory that is certified or seeks to be certified in any of Categories CLP01 through 7, the QA officer shall meet the applicable requirements of (b)9 below. For any other laboratory, the QA Officer shall meet the applicable requirements of (b) below for a supervisor in any Category, provided however, that an individual who meets only the requirements for a supervisor in the Categories listed in (b)2 below may serve as the QA Officer only in those Categories; and
4. If required under (b) below, technical support staff, who shall be qualified in accordance with the applicable provisions of (b) below for the tests and analyses within

the Category or Categories for which the environmental laboratory is certified, or seeks certification.

(b) No environmental laboratory shall be certified to perform analyses in a Category unless the supervisor and operating personnel (where so indicated) meet the following requirements:

1. For microbiological testing in Categories SDW01, WPP01 and SHW01, the supervisor shall meet the requirements of at least one of the qualification levels listed below:

Qualification Level	Degree	Microbiology Credits	Years of Experience
			Microbiological Analysis
A	≥BA/BS ¹	4 ²	1
B	AA ¹	4 ²	3
C	None	0 ²	5

¹ Degree in a chemical physical, biological, or environmental science from an accredited institution.

² Course from accredited college, or equivalent course from a training institute if supervisor has less than four semester hours credit in bacteriology.

2. For chemical testing in analyze-immediately Categories SDW03, WPP03 and SHW03 for residual chlorine, chlorine dioxide, residual ozone, dissolved oxygen with probe, sulfite, temperature, pH, and Categories SDW02 and WPP02 for turbidity and residue-settleable, the supervisor shall have had at least three months of experience in performing these tests;

3. For chemical testing in Categories: DW2. Inorganic Parameters including Sodium and Calcium; WPP02. Inorganic Parameters, Nutrients & Demand (except those listed in (b)2 above), the supervisor shall meet the requirements of at least one of the qualification levels listed below:

Qualification Level	Degree	Years of Chemical Experience
		Chemical Analysis and/or Training
A	≥BA/BS ¹	1 ²
B	AA ¹	3 ²
C	None	5 ²

¹ Degree in a chemical physical biological, or environmental science from an accredited institution.

² Have at least one year of laboratory experience in the chemical analysis of drinking water, water pollution, or solid/hazardous waste samples.

4. For chemical testing in Categories: SDW04. Inorganic Parameters, Metals; WPP04. Inorganic Parameters, Metals; SHW04. Inorganic Parameters, Metals; SHW09. Miscellaneous Parameters, and SHW10. Facility Specific Methods, the supervisor shall meet the requirements of at least one of the qualification levels listed below:

Qualification Level	Degree	Years of Chemical Experience
		Chemical Analysis and/or Training
A	≥BA/BS ¹	1 ²
B	AA ¹	3 ²
C	None	5 ³

¹ Degree in a chemical physical, biological, or environmental science from an accredited institution.

² Have at least one year of laboratory experience in the analysis of drinking water, water pollution, or solid/hazardous waste samples; and have six months experience in one or more instrumental techniques for the determination of metals, minerals (asbestos), metal ions, or anions, or have completed a formal training course in the operation of one or more of those instruments.

³ Same as footnote 2 above except that three years of laboratory experience in the analysis of drinking water, water pollution, or solid/hazardous waste samples is required.

5. Operators of ICP/MS instruments shall meet the requirements of (b)4 above, but in addition, are required to have both six months operating experience and a formal training course in ICP/MS;

6. Operators of transmission electron microscopes (TEMs) shall meet one of the qualification levels of (b)4 above, but the number of years of experience required at all levels must include one year in determining asbestos in air or water using a TEM and energy dispersive x-ray analyzer. Operators shall have completed a formal training course in transmission electron microscopy;

7. For chemical testing in Categories: SDW05, Organic Parameters, Chromatography; SDW06, Organic Parameters, Chromatography/Mass Spectrometry; WPP05, Organic Parameters, Chromatography; WPP06, Organic Parameters, Chromatography/Mass Spectrometry; WPP07, Individual Pesticides (GC, GC/MS, TLC); SHW05, Organic Parameters, Preparation & Screening; SHW06, Organic Parameters, Chromatography; SDW07, Organic Parameters, Chromatography/Mass Spectrometry; SHW08, Polychlorinated Dibenzo-p-dioxins and Polychlorinated Dibenzofurans; SHW09, Miscellaneous Parameters; SHW10, Facility Specific Parameters; SHW11, Incinerator Emissions; and SHW12, Immunoassay, the supervisor shall meet the requirements of at least one of the qualification levels listed below:

Qualification Level	Degree	Years of Chemical Experience
		Chemical Analysis and/or Training
A	≥BA/BS ¹	1 ²
B	AA ¹	3 ²
C	None	5 ³

¹ Degree in a chemical physical, biological, or environmental science from an accredited institution.

² At least one year of laboratory experience in chemical testing of drinking water, water pollution, or solid/hazardous waste samples; and have six months experience in one or more instrumental technique (GC, LC, GC/MS, or LC/MS) being practiced for the analysis of drinking water, water pollution or solid/hazardous waste samples. A formal training course in the instrumental technique for which certification is sought may be substituted for the experience requirements.

³ Same as footnote 2 above except that three years of laboratory experience in chemical testing of drinking water, water pollution, or solid/hazardous waste samples is required.

8. Operators of GC/MS, and LC/MS instruments shall meet the requirements of (b)7 above, but in addition, are required to have both six months operating experience and a formal training course in the technique being practiced;

9. For chemical testing in Categories: CLP01, Multi-Media/Multi-Concentration Inorganic Parameters; CLP02, Multi-Media/Multi-Concentration Organic Parameters; CLP03, Polychlorinated Dibenzo-p-dioxins & Polychlorinated Dibenzofurans; CLP04, Multi-Media/High Concentration Inorganic Parameters; CLP05, Multi-Media High Concentration Organic Parameters; CLP06, Low Concentration Water for Inorganic Parameters; and CLP07, Low Concentration Water for Organic Parameters, the laboratory shall have qualified personnel to perform the analyses under the CLP categories of analysis.

10. For Radiochemical Testing in Categories: SDW07, Radiochemistry: Radioactivity & Radionuclide Parameters; SDW08, Radon in Drinking Water; WPP09, Radiochemistry: Radioactivity & Radionuclide Parameters; and

WPP10, Radon in Wastewater, the supervisor shall meet the requirements of at least one of the qualification levels listed below:

Qualification Level	Degree	Years of Experience
		Chemical Analysis and/or Training
A	≥BA/BS ¹	5 ²
B	AA ¹	7 ²

¹ Degree in a chemical, radiochemical, radioisotope technology, biological, physical or environmental science from an accredited institution.
² Two years of experience must be in radiochemical analysis.

11. For Category RAP01, Radon/Radon Progeny-in-Air, the supervisor shall meet the requirements of at least one of the qualification levels listed below:

Qualification Level	Degree	Years of Chemical Experience
		Chemical Analysis and/or Training
A	≥BA/BS ¹	1 ²
B	AA ¹	3 ²
C	None	5 ³

¹ Degree in a chemical, radiochemical, radioisotope technology, biological, physical or environmental science from an accredited institution.
² Two years of experience must be in radiochemical analysis.

12. For Toxicity Testing in Category WPPO8, the supervisor shall meet the requirements of at least one of the qualification levels listed below:

Qualification Level	Degree	Credits	Years of Experience
			Toxicity Testing and/or Training
A	≥BA/BS ¹	6 ²	1 ^{3,4}
B	MA ³ or MS ³	6 ²	— ⁴

¹ Degree in a biological or environmental science from an accredited institution.
² Shall include or be supplemented by six semester credit hours in any of the following subjects: (a) General Zoology; (b) Biological Methods and Experimental Design; (c) Ichthyology.
³ Shall have successfully completed at least six definitive bioassays prior to applying for supervisor. The laboratory shall retain the documentation for these assays, and make it available during an audit by a representative of the Department.
⁴ Demonstrate competency in the operation of bioassay equipment and techniques during an audit by a representative of the Department.

13. If the bachelor degree is required and was granted from a regionally accredited United States or Canadian college or university, the requirement is satisfied. If the degree was granted by a foreign college or university, a copy of the evaluation by the World Education Service, Inc., P.O. Box 745, Old Chelsea Station, New York, NY 10013, (212) 966-6311, shall be provided to the Department; and

14. The Department may waive the need for specified years of experience or academic training if an individual demonstrates that he or she has knowledge, expertise and ability that is at least equal to what would be expected from an individual with the required amount of experience and academic training.

Amended by R.2001 d.224, effective July 2, 2001.
 Sec: 33 N.J.R. 1063(a), 33 N.J.R. 2284(c).
 Amended categories throughout.
 Amended by R.2001 d.345, effective September 17, 2001.
 Sec: 33 N.J.R. 1284(a), 33 N.J.R. 3351(a).
 In (b)12, deleted "Acute" preceding "Toxicity Testing" throughout.

7:18-2.11 Duties of environmental laboratory personnel

(a) In its quality assurance/quality control manual maintained pursuant to N.J.A.C. 7:18-4.5, 5.5, 6.6, 7.7 and 8.4, a

certified environmental laboratory shall include duties of the manager, all supervisors, and the quality assurance officer.

1. The duties of the manager include, but are not limited to, the following:

i. The manager shall administer the operations of the environmental laboratory including the reporting of tests and analyses. The manager shall be available for personal or telephone consultation with the environmental laboratory staff and the Department. If the manager is to be absent, the manager shall arrange for a substitute. When serving as supervisor or acting supervisor, the manager shall meet the requirements of N.J.A.C. 7:18-2.10(b);

ii. The manager shall assure that all laboratory personnel meet the applicable requirements of N.J.A.C. 7:18-2:10(b) for their classification; and

iii. The manager or designee thereof shall sign reports of analytical data. The laboratory shall inform the Department of the designee's name and authority to sign reports.

2. The duties of supervisors include, but are not limited to, the following:

i. Each supervisor shall monitor the performance of technical personnel performing the analysis of a parameter to determine whether the personnel are complying with applicable requirements of this chapter. Each supervisor shall report results within the Category or Categories for which the supervisor is qualified;

ii. Each supervisor shall only perform tests or analyses within the Category or Categories for which the supervisor is qualified; and

iii. Each supervisor shall oversee the performance of all laboratory procedures, tests, analyses, and quality assurance within the Category or Categories for which the supervisor is qualified, to assure that it is in compliance with this chapter.

3. The duties of the quality assurance officer include, but are not limited to, the following:

i. The quality assurance (QA) officer shall ensure that the environmental laboratory follows the quality control procedures of the DSAMs and of N.J.A.C. 7:18-3 through 8; and

ii. The QA officer shall implement the procedures of the environmental laboratory's quality assurance/quality control manual, pursuant to N.J.A.C. 7:18-4.5, 5.5, 6.6, 7.7 and 8.4.

Administrative change.
 Sec: 28 N.J.R. 4098(a).

7:18-2.12 Criteria for acceptance and analysis of environmental regulatory samples

(a) A certified environmental laboratory shall offer as a service only those tests, analyses, and procedures that:

1. Are within the scope of the laboratory's certification and Annual Certified Parameter List;
2. For which it has a qualified supervisor who meets the applicable requirements of N.J.A.C. 7:18-2.10(b); and
3. For which personnel, equipment and facilities meeting the applicable requirements of this chapter are available.

(b) An environmental laboratory certified in an analytical method and claiming to perform that method for parties other than those in the regulated community shall always follow the requirements and criteria cited in that specific analytical method.

(c) This section applies to certified environmental laboratories and environmental laboratories that hold temporary approval.

7:18-2.13 Proficiency testing program

(a) A laboratory seeking certification for any parameter shall successfully complete the proficiency testing program described in (h) through (j) below for that parameter.

(b) To maintain certification, a certified environmental laboratory shall successfully complete proficiency testing pursuant to (h) through (j) below.

1. For all categories other than radiochemical testing, radon in water, and radon/radon progeny-in-air:

- i. The Department or its designated testing program will conduct at least two proficiency tests per parameter (including indicator parameters) each year. All laboratories certified for that parameter (including indicator parameters) shall participate in at least one proficiency test each year. If a laboratory fails to successfully complete a proficiency test, it shall participate in the next scheduled proficiency test;

- ii. Upon the Department's request, a particular laboratory shall participate in proficiency tests in addition to the test or tests under (b)1 above. The Department may make such a request based upon information indicating that the laboratory's analyses for the parameter in question do not meet the requirements of this chapter; and

- iii. A laboratory shall not be required to participate in more than two proficiency tests pursuant to (b)1i and ii above in a certification year.

2. For radiochemical testing, a laboratory shall acceptably analyze one USEPA blind PE sample and two performance evaluation samples per year.

3. For radon in water, a laboratory shall acceptably analyze all required PE samples, not to exceed four samples per year.

4. For radon/radon progeny-in-air, a laboratory shall not be required to participate in more than four proficiency tests in a certification year.

(c) Proficiency testing for a specific parameter or group thereof in a particular Category is not required if the Department determines that PE samples are unavailable.

(d) Except as provided in (e) through (g) below, the Department or its designated proficiency testing program shall distribute PE samples or make them available, at times and frequencies that the Department determines are necessary for effective administration of proficiency testing. N.J.A.C. 7:18-2.9(g) provides for the Department to be reimbursed if it purchases PE samples to send to a laboratory for use in the proficiency testing program.

(e) A laboratory shall obtain PE samples for the determination of radioactivity and radionuclide parameters in water from the USEPA's radiological proficiency testing program or from the Department's designated proficiency testing program.

(f) A laboratory shall obtain PE samples for the determination of radon in water from the USEPA's Intercomparison Study Program or from the Department's designated proficiency testing program.

(g) A laboratory shall obtain PE samples for the determination of radon/radon progeny-in-air from the USEPA's Radon Measurement Program or from the Department's designated proficiency testing program.

(h) A laboratory participating in the proficiency testing program shall perform the following tasks:

1. Receive, examine, and analyze PE samples according to instructions;

2. Maintain all records of PE testing results;

3. For all Categories, except radiochemical testing, radon in water, and radon/radon progeny-in-air, submit the results of PE testing to the Department for evaluation, in accordance with the Department's instructions;

4. For radiochemical testing, radon in water, and radon/radon progeny-in-air Categories, submit results of PE testing in accordance with the directions of the USEPA or the authorized proficiency testing program; and

5. For radon/radon progeny-in-air, submit evaluated radon measurement proficiency results to the Department.

(i) The specific requirements for the proficiency testing program are set forth below in this subsection.

1. For a laboratory seeking certification in any Category other than radiochemical testing, radon in water, or radon/radon progeny-in-air:

i. A laboratory that has participated in the USEPA Drinking Water and/or Water Pollution Proficiency Testing Program during the immediate preceding 12 months may submit, for the Department's evaluation, the results for the parameters for which it is applying in the Department's Drinking Water and/or Water Pollution Programs. Otherwise the conditions of (i)1ii below apply; and

ii. A laboratory seeking certification in a specific parameter or group thereof under a particular Category shall acceptably analyze a PE sample obtained in accordance with (d) above. The laboratory shall have two separate opportunities to acceptably analyze PE samples for each parameter. If the laboratory fails in both opportunities to acceptably analyze PE samples for a parameter, the Department shall deny the application for certification. The laboratory may reapply for certification in that parameter.

2. For a laboratory seeking certification in radiochemistry, radioactivity and radionuclide testing, or radon/radon progeny-in-air:

i. For analysis of radiochemical parameters in water, the laboratory shall submit copies of USEPA performance evaluation reports indicating that for radiochemical PE tests analyzed within the preceding 12 months, two blind PE samples or two cross-check samples have been within the control limits established for each parameter in which certification is sought;

ii. For analysis of radon in drinking water and wastewater samples, the laboratory shall submit copies of USEPA performance evaluation reports indicating that during the applicant's participation in the most recent USEPA Radon Intercomparison Study, at least two blind PE samples or two cross-check samples were within the established control limits; and

iii. For analysis of radon/radon progeny-in-air, the laboratory shall submit copies of performance evaluation reports showing passage of two Department-authorized proficiency tests. At least one of the tests shall be either the most recent round of the USEPA Radon Measurement Program or a proficiency test administered within the past 12 months from a Department-authorized proficiency testing program. The laboratory shall pass a test for each measurement device/technique for which certification is desired, prior to applying for certification.

3. For certified environmental laboratories:

i. For all Categories, except radiochemical testing, radon in water, and radon/radon progeny-in-air, the Department shall notify the laboratory, in writing by certified mail, of the following: an announcement of

each proficiency test, the final shipping date of PE samples, and the date results are to be submitted to the Department.

ii. In connection with a proficiency test announced under (i)3i above, if a laboratory receives PE samples that are not in satisfactory condition, or does not receive PE samples at all, the laboratory shall notify the Department within 15 days after the final shipping date. The Department may establish a new date for submission of results for those laboratories requiring replacement samples, based on the date that replacement samples are sent to those laboratories. If a laboratory does not notify the Department within the allotted 15 days, the laboratory will be considered to have received all samples and received them in an acceptable condition for analysis;

iii. For the Radiochemical Categories, the scheduling and requirements for the proficiency test are as established by the USEPA. For the Radon/Radon Progeny-in-Air Categories, the laboratory shall contact the OQA to obtain a list of exposure facilities approved for the Department's authorized radon/radon progeny-in-air proficiency testing program. The laboratory shall arrange with the exposure facility to schedule an exposure period for the laboratory's test devices;

iv. During a proficiency test, if a laboratory decides to drop any parameter pursuant to N.J.A.C. 7:18-2.15(a), it shall notify the Department before the final date for submission of results. Otherwise, the laboratory shall report results for all analyses for which it was certified at the time of the proficiency test announcement;

v. The Department shall consider the results of each proficiency test in determining whether the certification of a laboratory should be maintained or suspended;

vi. The Department may require a laboratory to analyze additional PE samples beyond what is required under (i)3i above, if information available to the Department indicates that the laboratory is failing to acceptably analyze samples; and

vii. Upon request of any person using or requesting the services of a certified environmental laboratory, the laboratory shall make available all results of the past 12 months' PE testing.

(j) Specific requirements for acceptable analysis of PE samples are as follows:

1. For microbiological testing, chemical testing, and toxicity testing:

i. For all drinking water parameters and water pollution parameters tested using the USEPA proficiency studies, the reported values must fall within the accep-

tance limits established for a given PE sample study by the USEPA;

ii. For proficiency studies, inclusive of all parameters in all Categories (except radon/radon progeny-in-air) and conducted independently of the USEPA proficiency test programs for drinking water and water pollution, reported values for PE samples must fall within the following acceptance limits:

(1) For a set of PE samples from a natural sample matrix, analytical results for a given parameter must fall within the 99 percent confidence interval about the mean value; and

(2) For a set of PE samples with a known amount of analyte added, analytical results for a given parameter must fall within the 95 percent confidence interval about the target value for drinking water samples, and within the 99 percent confidence interval for other sample matrices; and

iii. For the radon/radon progeny-in-air measurement proficiency program the criterion used in evaluating the radon measurement test results requires that the value of the individual relative error (IRE) of radon measurement not exceed 25 percent.

Amended by R.2001 d.345, effective September 17, 2001.

See: 33 N.J.R. 1284(a), 33 N.J.R. 3351(a).

In (j)1, deleted "acute" preceding "toxicity".

7:18-2.14 On-site audits

(a) A certified environmental laboratory or a laboratory seeking certification shall permit and facilitate scheduled and unscheduled audits by the OQA or its designee as a condition of obtaining and maintaining certification. The laboratory shall allow the OQA access to its facility to conduct the audit. A refusal to allow entry is grounds for revocation or denial of certification.

- i. The accuracy shall be within ± 0.05 pH units;
 - ii. The scale readability shall be ± 0.05 pH units;
 - iii. Both indicating and reference electrodes shall be rinsed with reagent water after each reading;
 - iv. Samples shall be stirred during measurement at a constant rate, minimizing the air transference at the air water interface of sample;
 - v. Electrodes shall be stored according to the manufacturer's recommendations;
 - vi. The meter shall be capable of temperature compensation;
 - vii. All pH meters shall be calibrated each day of use. This shall include calibration with two standard pH buffers bracketing the value to be measured. After calibration, a standard buffer with pH within the calibration range shall be measured without any control adjustments to check the calibration. All calibration and check data shall be recorded in a log book, signed, and dated by the analyst. When the pH meter is in use for longer than a three hour period, the pH of the third buffer shall be checked once every three hours. If the pH differs by more than ± 0.2 pH units from the standard buffer value, the meter shall be recalibrated; and
 - viii. Discard pH buffer calibration aliquots after each use.
4. Continuous pH monitoring devices shall be operated in accordance with the manufacturer's instructions and the following requirements:
- i. The accuracy shall be within ± 0.1 pH units;
 - ii. The scale readability shall be ± 0.1 pH units;
 - iii. A strip chart recorder or electronic equivalent shall be used;
 - iv. Continuous pH monitoring devices shall be calibrated weekly, at a minimum, using one of the following procedures:
 - (1) Direct calibration: The electrode shall be calibrated at a minimum of two points that bracket the expected pH of the water/waste and are approximately three pH units or more apart. A record shall be made of each calibration in a log book, signed and dated by the analyst; or
 - (2) Indirect calibration: Collect a grab sample of the flowing material from a point as close to the electrode as possible and record the reading. Measure the pH of this grab sample as quickly as possible (within 15 minutes) with a laboratory-type pH meter that has been calibrated prior to use against two buffers as stated in (a)3vii above. Calculate the difference between the two readings. Add or subtract the difference (depending on whether the laboratory meter reading is higher or lower than the continuous monitor reading) to the current reading of the continuous monitor by adjusting its calibration control. Make a record of each calibration in a log book, and have the record signed and dated by the analyst; and
 - v. Discard pH buffer calibration aliquots after each use.
5. Temperature-monitoring devices shall meet the following requirements:
- i. Temperature monitoring devices shall be graduated in at least 0.5 degrees Celsius increments for all analyses except fecal coliform analysis which shall be graduated in at least 0.2 degrees Celsius;
 - ii. Continuous temperature-monitoring devices shall be accurate to ± 0.5 degrees Celsius;
 - iii. The liquid column of glass thermometers shall have no separation;
 - iv. A NIST certified thermometer graduated in at least 0.2 degrees Celsius increments shall be available at all times for use by the certified environmental laboratory covering the complete range for all analyses for which the laboratory is certified and shall be calibrated at appropriate points at or near the critical temperature or range for the temperature being measured. A certificate must accompany the certified thermometer with matching identification number; and
 - v. The accuracy of all thermometers used to monitor temperatures shall be verified over the range used by comparing the readings of such thermometers with the readings of a NIST certified thermometer in the temperature ranges for which they will be used. A record shall be made containing the identification number of each thermometer, the temperatures displayed on the certified thermometer and the thermometer being verified, correction factors when applicable, dates on which quality control checks were performed, and the name of the analyst performing such checks. Glass thermometers shall be verified yearly and metal thermometers or thermocouples or infra-red temperature measuring devices shall be verified quarterly and the data recorded in a log book, signed and dated by the analyst.
6. Conductivity meters, shall be readable in ohms-cm or mhos/cm, have a range of two to 20,000,000 ohms-cm or equivalent mhos/cm and an accuracy of ± 1 percent;
- i. Conductivity cells shall have platinum electrodes or be calibrated using a meter with platinum electrodes;
 - ii. Conductivity meters shall be capable of temperature compensation; and
 - iii. An initial five point calibration curve shall be established using potassium chloride solutions of vari-

ous concentrations to cover the necessary range. A single potassium chloride standard shall then be used as a check standard whenever specific conductance measurements are made. The cell constant must be determined and all calculations recorded annually in a log book, signed and dated by the analyst.

7. Refrigerators used to store samples, standards or laboratory reagents shall meet the following criteria:

i. A household refrigerator may be used for storage of aqueous reagents and samples. For storage of organics and flammable materials, an "explosion proof" refrigerator shall be used. Refrigerators shall maintain an internal temperature between one and five degrees Celsius (34 to 41 degrees Fahrenheit). Thermometers shall be immersed in a container filled with a liquid and placed on one of the shelves of each refrigerator being used to store regulatory samples. The specific temperature of the refrigerator should be at the level necessary to support the handling and preservation requirements of the analytical method or the sample preservation tables of the Code of Federal Regulations incorporated by reference into this chapter; and

ii. The temperature of all refrigerators used for storage of samples, standards, and environmental laboratory reagents shall be monitored daily and recorded in a permanent log book, signed and dated by the analyst. Corrective action shall be taken and appropriate notation made in the log whenever temperatures fall outside the range specified in (a)7i above.

8. Environmental laboratory glassware, plasticware and metal utensils shall meet the following requirements:

i. Beakers, flasks and other general environmental laboratory glassware shall be made of borosilicate glass that is resistant to damage by heat, chemicals and repeated use. The laboratory shall use only Class "A" volumetric glassware, and need not calibrate it before use;

ii. Unless otherwise specified, borosilicate bottles shall be used for the storage of reagents and standard solutions;

iii. Polyethylene bottles may be used where appropriate for storage of reagents and standard solutions;

iv. Serological or Mohr-type pipets are not volumetric pipets and shall not be used in tests or analysis requiring quantitative sample transfer and measurement;

v. When small quantities of analytical reagents are required to be measured, serial dilutions using class "A" glassware shall be performed. Automatic or digital type pipets shall be calibrated for accuracy and precision on a quarterly basis using reagent water and an analytical balance. Digital pipets shall meet the specifications of Class "A" pipets. The calibration record shall be recorded in a logbook and the record signed by the analyst;

vi. Glassware and metal utensils shall be resistant to the effects of corrosion, high temperatures, and vigorous cleaning operations;

vii. Flasks, beakers, dilution bottles, culture dishes, culture tubes and other glassware shall be free of chips, cracks, and excessive etching;

viii. Plastic items shall be made of clear, inert, nontoxic materials and shall retain accurate calibration marks after repeated autoclaving;

ix. Metal utensils shall be made of stainless steel; and

x. All glassware shall be washed in a warm detergent solution and thoroughly rinsed first in tap water and then in reagent water. If a specific analytical method requires more stringent cleaning procedures, the cleaning procedures given in the analytical method shall be performed.

9. A source of water that meets the required standards of quality for each type of testing shall be available for use in the preparation of reagents, standards, and for glassware rinsing. If the water of the required quality is not produced in the environmental laboratory, it shall be purchased from commercial suppliers. The environmental laboratory shall maintain a file of the required analysis for each lot of water. A source of purified water is not necessary for radon/radon progeny-in-air analyses.

10. A gravity convection drying oven or infrared drying lamp shall be capable of maintaining stable drying temperatures.

11. Glass or plastic desiccators shall be used as specified by the analytical method.

12. Hot plates shall have temperature controls.

Cross References

Laboratory equipment, instruments and materials, see N.J.A.C. 7:18-7.3.

SUBCHAPTER 4. MICROBIOLOGICAL TESTING

7:18-4.1 Scope

(a) This subchapter applies to certified environmental laboratories when performing microbiological testing on regulatory samples, and to other laboratories performing microbiological testing on PE samples to become certified. This subchapter applies to microbiological testing for parameters in the following categories:

1. Drinking Water Program—Category SDW01, Microbiology Parameters;
2. Water Pollution Program—Category WPP01, Microbiological Parameters; and

3. Solid/Hazardous Waste Program—Category SHW01, Microbiological Parameters.

(b) A laboratory qualifying for certification to perform total coliform analysis on samples for compliance with the Department's Bureau of Safe Drinking Water program shall concurrently qualify to perform fecal coliform and/or E. coli analyses so that the presence or absence of either in a drinking water sample can be determined and reported within the time limits specified in N.J.A.C. 7:18-4.6(k).

(c) In addition to satisfying the applicable requirements of N.J.A.C. 7:18-1 through 3, a laboratory performing microbiological testing within the scope of (a) above shall follow:

1. All applicable requirements in this subchapter; and
2. All requirements specified in the applicable DSAMs, including, without limitation, any requirements that are more stringent than the requirements in this subchapter.

Amended by R.2001 d.224, effective July 2, 2001.
See: 33 N.J.R. 1063(a), 33 N.J.R. 2284(c).

In (a), amended categories.

7:18-4.2 Requirements for environmental laboratory equipment, supplies and materials

(a) The supervisor shall have control over the equipment, supplies and materials used in microbiological testing. The equipment, supplies and materials shall meet the requirements of N.J.A.C. 7:18-3, the applicable DSAM, and the following:

1. Air or water-jacketed incubators, aluminum block incubators, and water baths shall meet the following requirements:

- i. Incubators and water baths shall be sized to accommodate periods of peak work load;
- ii. Incubators and water baths must maintain internal temperatures as specified in the analytical method being performed;
- iii. When aluminum block incubators are used, culture dishes and tubes shall fit snugly within the block;
- iv. The water bath shall be equipped with a calibrated temperature monitoring device graduated in increments of at least 0.2 degrees Celsius; and
- v. Whenever an air incubator is in use, a calibrated temperature monitoring device with its sensor or bulb immersed in liquid shall be placed on the topmost and bottommost shelf in use within the incubator. If only one shelf in the incubator is in use, the calibrated temperature monitoring device shall be placed on that shelf.

2. Autoclaves shall meet the following requirements:

i. The autoclave shall be in good operating condition when observed during its operational cycle or when time temperature charts are read;

ii. The autoclave shall be equipped with an accurate temperature monitoring device and a working safety valve;

iii. The autoclave shall be equipped with an accurate pressure gauge, unless the laboratory has documentation from the manufacturer of the autoclave certifying that the equipment will operate safely without a pressure gauge;

iv. The autoclave shall reach the sterilization temperature of 121 degrees Celsius, maintain that temperature throughout the sterilization period, and complete the autoclave cycle in no more than 45 minutes when a 12 to 15 minute sterilization period is used for culture media; and

v. During depressurization, the autoclave shall not produce air bubbles in the fermentation media.

3. Hot air ovens shall meet the following requirements:

i. The hot air oven shall be able to maintain a stable sterilization temperature of 170 to 180 degrees Celsius for at least two hours;

ii. Hot air ovens shall be used for sterilization of glass pipets, bottles, flasks, culture dishes, and other laboratory glassware and utensils; and

iii. A calibrated temperature monitoring device in increments no larger than 10 degrees Celsius with its sensor or bulb placed in sand shall be placed on one of the shelves in use within the hot air oven.

4. Optical, counting, and lighting equipment shall meet the following requirements:

i. At least one low-power magnification device with 10 to 15x magnification, for use in counting membrane filtration colonies;

ii. A fluorescent light source for use in counting total coliform MF colonies;

iii. A mechanical hand tally for use in counting bacteria colonies; and

iv. A colony counter, dark field model, to count Heterotrophic Plate Count colonies.

5. Inoculation equipment shall meet the following requirements:

i. The diameter of inoculation loops shall be at least three millimeters and the loops shall be constructed of 24 to 26 gauge Nichrome, chrome, or platinum-iridium wire;

- ii. Either single-service metal inoculation loops, pre-sterilized plastic inoculation loops, or reusable metal inoculation loops shall be used; and
 - iii. Disposable dry-heat-sterilized hardwood applicator sticks may be used.
6. Membrane filtration (MF) equipment shall meet the following requirements:
- i. Units used in MF procedures shall be made of stainless steel, glass, or autoclavable plastic;
 - ii. MF equipment shall not leak and shall not be corroded; and
 - iii. Field equipment may be used for coliform and all bacterial analysis using the membrane filter procedure; however, standard laboratory MF procedures must be followed when using field equipment.
7. Membrane filters and pads shall meet the following requirements:
- i. Membrane filters shall be manufactured from cellulose ester materials, and shall be white, grid-marked, and have a 47 millimeter diameter and 0.45 micrometer (μm) pore size; however, another pore size may be used when the performance data provided by the manufacturer show the performance of that pore size to be equal to or better than the performance of the 0.45 μm membrane filter; and
 - ii. Membrane filters and pads shall be either autoclavable or presterilized.
8. Pipets shall meet the following requirements:
- i. Sterile, glass or plastic pipets shall be used for measuring quantities of 10 milliliters or less; and shall be accurate within a 2.5 percent tolerance or less;
 - ii. Glass pipets shall be made of borosilicate glass; and
 - iii. Pipets shall not be excessively etched, mouth-piece or delivery tips shall not be chipped, and graduation marks shall be legible.
9. Pipet containers shall meet the following requirements:
- i. Open packs of disposable sterilized pipets shall be resealed after each use; and
 - ii. Pipet containers shall be made of aluminum or stainless steel or individual pipets shall be wrapped in char-resistant paper.
10. Culture dishes shall meet the following requirements:
- i. Sterile plastic culture dishes with tight or loose lids, or glass culture dishes with loose lids shall be used; and

- ii. When culture dishes with loose lids are used, the relative humidity in the incubator shall not be less than 90 percent.
11. Culture dish containers shall meet the following requirements:
- i. Culture dish containers shall be made of either aluminum or stainless steel, or the culture dishes shall be wrapped in heavy aluminum foil or char-resistant paper; and
 - ii. Open packs of disposable sterile culture dishes shall be resealed after each use.
12. Culture tubes and closures shall meet the following requirements:
- i. Culture tubes shall be made of borosilicate glass or other corrosion resistant glass and shall be of a sufficient size to contain both the culture medium and the sample portions to be tested, without being more than three-quarters full; and
 - ii. Caps should be made of snug-fitting stainless steel or plastic; however, loose-fitting aluminum caps or screw caps with non-toxic liners are also acceptable.

7:18-4.3 Required use of DSAMs

(a) In performing microbiological analysis of a regulatory sample (including, without limitation, analysis of a PE sample by a laboratory that is applying to become certified), a laboratory shall use only:

1. A DSAM from the applicable Category listed in N.J.A.C. 7:18-4.1(a) for which the laboratory is certified or is applying to become certified; or
2. An ATP approved by the Department for the laboratory and, if applicable, for the facility in question.

(b) The requirements of (a) above do not apply to the analysis of a non-regulatory sample, if the requirements of N.J.A.C. 7:18-2.22(b) are satisfied.

7:18-4.4 Requirements for general environmental laboratory practices

(a) A laboratory performing microbiological analysis shall practice and meet the requirements listed in (a)1 through 4 below.

1. The laboratory shall follow sterilization procedures meeting the following requirements:

- i. The times for autoclaving materials at 121 degrees Celsius are listed below. Except for membrane filters and pads and carbohydrate-containing media, indicated times are minimal times which may necessitate adjustment depending upon volumes, containers, and loads;

<u>Material</u>	<u>Time (Minutes)</u>
Membrane filters and pads	10

<u>Material</u>	<u>Time (Minutes)</u>
Carbohydrate-containing media (lauryl tryptose, brilliant green lactose bile broth, etc.)	12-15
Contaminated materials and discarded tests	30
Membrane filter assemblies (wrapped), sample collection bottles (empty), individual glassware items	15
Rinse water	15
Dilution water blanks	15

ii. Membrane filter assemblies shall be sterilized at the start of the first filtration series, either by autoclaving in accordance with (a)1i above, or by two minutes of exposure in an ultraviolet sterilizer unit. The laboratory shall not use the ultraviolet sterilizer unit if its use affects the validity of the results. The laboratory shall test the ultraviolet lamps quarterly with a light meter and a spread plate irradiation test. The laboratory shall not reuse a filtration unit without sterilizing it if 30 minutes or more has elapsed since the last sample was filtered; and

13. The laboratory shall check at least one sample container from each batch of laboratory sterilized sample containers or at least one sample container from each batch or lot of purchased sterile containers. The laboratory shall add approximately 25 milliliters of sterile non-selective broth to the container or containers being checked, and incubate the preparation at 35 degrees \pm 0.5 degrees Celsius for 24 hours. At the end of the incubation period, the laboratory shall check the container for growth, and record the results. If bacterial growth is observed, the batch shall be resterilized and the results recorded;

14. The laboratory shall maintain annual service contracts or internal protocols on balances, autoclave, water still, and any other equipment requiring periodic servicing. The laboratory shall enter records of actual servicing in a log book. The laboratory shall make these contracts, protocols and service records available to the Department during inspections or upon the Department's request;

15. The laboratory shall maintain records of preparation of each batch of sterilized media. In the records, the laboratory shall include the lot number of the batch, date of preparation, sterilization time and temperature, final pH of each batch, and the preparing technician's name. The laboratory shall make these records available to the Department during inspections or upon the Department's request;

16. The laboratory shall label each bottle of dehydrated media with the date of receipt, and the date on which the bottle is first opened. The laboratory shall not use the media more than six months after it is first opened, provided however, that if the bottle is stored in a desiccator the media may be used for 12 months after it is first opened;

17. The laboratory shall record the lot number of packages of membrane filters and date of receipt;

18. The laboratory shall use heat-sensitive tapes, spore strips, spore ampules or a maximum registering thermometer during each autoclave cycle;

19. The laboratory shall label all reagents and solutions to identify them and indicate other information pertinent to identification, such as (when applicable) strength or concentration, storage requirements, preparation date, expiration date, and other information pertinent to identification; and

20. The laboratory shall not use any caked or discolored media, or any media that has exceeded the manufacturer's expiration date. The laboratory shall discard such media immediately.

Cross References

Duties of environmental laboratory personnel, see N.J.A.C. 7:18-2.11.

7:18-4.6 Requirements for records and data reporting

(a) The laboratory shall retain records concerning microbiological analyses. The records to be retained include raw data records, quality control data records (including records of all quality control checks under N.J.A.C. 7:18-4.5(c)), chain-of-custody forms, laboratory reports, and the information required under (d) below. The laboratory shall retain each record for at least five years after the date of the analysis, provided however, that the laboratory shall retain records of analyses for 10 years if the person requesting the analyses has informed the laboratory that the analyses were to be performed because of epidemiological or public health concerns.

(b) The laboratory shall file and maintain data and other records in an accessible location on the laboratory's premises for one year after the date of analysis so that reviews can be conducted during on-site audits.

(c) The laboratory shall not accept custody of regulatory samples unless a chain-of-custody form is submitted with the samples, in accordance with N.J.A.C. 7:18-9.2(c)9.

1. Before accepting custody of a regulatory sample, the laboratory shall determine that the sample is properly labeled and has met the handling and preservation requirements. If the sample fails to meet those requirements, the laboratory shall indicate that failure on the chain-of-custody section of the sample request form or the chain-of-custody form;

2. The laboratory's sample custodian accepting responsibility for the sample shall sign the chain-of-custody form;

3. The laboratory shall have an internal chain-of-custody procedure or an alternate sample tracking procedure which establishes a sample's integrity and completely tracks its custody during its lifetime in the laboratory; and

4. If the analysis was not performed at the environmental laboratory that first received the sample, the chain-of-custody form shall include the name, address and identification number of the New Jersey certified environmental laboratory to which the sample was forwarded.

(d) The laboratory shall retain the following information as part of the records of analysis:

1. The assigned laboratory sample number or other unique form of identification;

2. The date and time of sample analysis;

3. The name and signature of the person or persons who performed the analysis;

4. The type of analysis performed and the DSAM used; and

5. The results of the analysis and the raw data generated by the analysis.

(e) The laboratory shall satisfy the following requirements in reporting results using the membrane filter (MF) procedure:

1. For microbiological testing other than total coliform in drinking water, if there is confluent growth, with or without typical discreet colonies covering the entire filtration area of the membrane, the laboratory shall report the results as "confluent growth per 100 milliliters with (or without) the organism for which the sample was tested (e.g., fecal coliform, fecal streptococci, etc.)." The laboratory shall also request a new sample; and

2. When the total number of bacterial colonies on the membrane is greater than 200 total colonies, or is not sufficiently distinct, or both, the laboratory shall report the results as "too numerous to count (TNTC) per 100 milliliters with (or without) the organism for which the sample was tested (e.g., fecal coliform, fecal streptococci, etc.)." The laboratory shall also request a new sample.

(f) Pending membrane filtration (MF) verification or most probable number (MPN) completion, the laboratory shall report positive results for drinking water samples as preliminary. After MF verification or MPN completion, the laboratory shall report the final results to the client.

(g) The laboratory shall check all results reported on final report forms against original data to make sure there are no transcription errors.

(h) The laboratory shall include the following information in reporting results to the client:

1. The certified environmental laboratory name and New Jersey laboratory identification number;
2. The date, time, and location of sample collection;
3. The type of analysis performed and the analytical method employed;
4. The results generated by the analysis; and
5. The name and signature of the environmental laboratory manager or designee identified under N.J.A.C. 7:18-2.11(a)iii.

(i) The laboratory shall not report results of analyses to the Department or to any other person unless the original or true duplicate of the results is sent to the client. The report shall be signed by the laboratory manager or designee identified under N.J.A.C. 7:18-2.11(a)iii.

(j) The laboratory shall not refer samples to another laboratory for analysis, unless the other laboratory is also a certified environmental laboratory. The laboratory requesting the analysis shall provide the results to the client, on the original or true duplicate forms from the certified environmental laboratory that performed the analysis, containing the New Jersey environmental laboratory identification number of the certified environmental laboratory that performed the analysis.

(k) When the laboratory determines the presence of fecal coliform or E. Coli in a drinking water sample, pursuant to 40 CFR 141.63(b), the laboratory shall notify the affected parties as follows:

1. For non-transient non-community and transient non-community water systems, the laboratory shall notify the water purveyor and the municipal health agency (or, if there is no municipal health agency for the municipality in question, the county health agency) within 24 hours or during the next business day; or

2. For community water systems, the laboratory shall notify the water system's superintendent and the Department's Bureau of Safe Drinking Water within 24 hours or during the next business day.

(l) If the laboratory discovers an error in the analysis of a regulatory sample, and the error may affect the validity of the reported analytical result, the environmental laboratory manager shall report the error to the regulatory program for which the analysis was conducted, and to the client. The laboratory shall make this notification within 72 hours after discovery of the error.

SUBCHAPTER 5. CHEMICAL TESTING

7:18-5.1 Scope

(a) This subchapter applies to certified environmental laboratories when performing chemical testing on regulatory samples, and to other laboratories performing chemical testing on PE samples to become certified. This subchapter applies to chemical testing for parameters in the following categories:

1. Drinking Water Program:

- i. Category SDW02, Inorganic Parameters Including Sodium & Calcium;
- ii. Category SDW04, Inorganic Parameters, Metals;
- iii. Category SDW05, Organic Parameters, Chromatography; and
- iv. Category SDW06, Organic Parameters, Chromatography/Mass Spectrometry.

2. Water Pollution Program:

- i. Category WPP02, Inorganic Parameters, Nutrients & Demand;
- ii. Category WPP04, Inorganic Parameters, Metals;
- iii. Category WPP05, Organic Parameters, Chromatography;
- iv. Category WPP06, Organic Parameters, Chromatography/Mass Spectrometry; and

v. Category WPP07, Individual Pesticides (GC, GC/MS, TLC).

3. Solid/Hazardous Waste Program:

- i. Category SHW02, Characteristics Testing;
- ii. Category SHW04, Inorganic Parameters;
- iii. Category SHW05, Organic Parameters, Preparation and Screening;
- iv. Category SHW06, Organic Parameters, Chromatography;
- v. Category SHW07, Organic Parameters, Chromatography/Mass Spectrometry;
- vi. Category SHW08, Polychlorinated Dibenzodioxins and Dibenzofurans;
- vii. Category SHW09, Miscellaneous Parameters;
- viii. Category SHW10, Facility-Specific Parameters;
- ix. Category SHW11, Incinerator Emissions; and
- x. Category SHW12, Immunoassay.

4. CERCLA-CLP Program:

- i. Category CLP01, Multi-Media, Multi-Concentration Inorganic Parameters;
- ii. Category CLP02, Multi-Media, Multi-Concentration Organic Parameters;
- iii. Category CLP03, Polychlorinated Dibenzo-p-dioxins and Dibenzofurans;
- iv. Category CLP04, Multi-Media, High Concentration Inorganic Parameters;
- v. Category CLP05, Multi-Media, High Concentration Organic Parameters;
- vi. Category CLP06, Low Concentration Water for Inorganic Parameters; and
- vii. Category CLP07, Low Concentration Water for Organic Parameters.

(b) In addition to satisfying the applicable requirements of N.J.A.C. 7:18-1 through 3, a laboratory performing chemical testing within the scope of (a) above shall follow:

1. All applicable requirements in this subchapter; and
2. All requirements specified in the applicable DSAMs, including without limitation any requirements that are more stringent than the requirements in this subchapter.

Amended by R.2001 d.224, effective July 2, 2001.
See: 33 N.J.R. 1063(a), 33 N.J.R. 2284(c).
Amended categories throughout.

7:18-5.2 Requirements for environmental laboratory equipment and instruments

(a) The supervisor shall have control over the equipment and instruments used in chemical testing. The laboratory shall use only equipment and instruments that meets the applicable requirements listed in (a)1 through 17 below, the applicable requirements of N.J.A.C. 7:18-3, and the requirements of the applicable DSAM.

1. Spectrophotometers (other than atomic absorption spectrophotometers) shall meet the following requirements:

- i. The spectral range shall be at least 400 to 700 nanometers (nm). The maximum spectral bandwidth shall be no more than 20 nm;
- ii. Wavelength accuracy shall be within ± 2.5 nm; and
- iii. Spectrophotometers shall employ a cell path length permitting a linear calibration of the instrument in the anticipated concentration range consistent with the DSAM.

2. Filter photometers or colorimeters shall meet the following requirements:

- i. Filter photometers or colorimeters shall have filters that isolate various radiant energy bands in the 400 to 700 nm range. The filters shall have a bandwidth between 10 and 70 nm; and
- ii. Filter photometers and colorimeters shall employ a cell path length permitting a linear calibration of the instrument in the anticipated concentration range consistent with the DSAM.

3. Atomic absorption spectrophotometers shall meet the following requirements:

- i. Atomic absorption spectrophotometers shall be single or multiple channel, single or double beam instruments having a grating monochromator, photomultiplier detector, adjustable slits, and provisions for interfacing with an analog/digital chart recorder/printer or a computer data system;
- ii. If used, a computer data system shall perform analog-digital conversions with integration, storage, and output. The laboratory shall produce completed header information for the computer system to define the unique sample, blank or standard run; date/time of analysis; analyst; parameter(s) concentrations, and or absorbance values;

iii. The instruments shall be operated with the fuel and oxidant gases specified by the analytical method;

iv. Instruments used to analyze metals as hydrides shall:

- (1) Have a hydride generator that meets the specifications of the applicable DSAM; and

- (2) Be able to meet the temperature and background correction requirements of the applicable DSAM.
4. For mercury analysis, a mercury analyzer or an atomic absorption spectrophotometer used for mercury analysis shall meet the following requirements:
- The laboratory shall operate the instruments used for cold-vapor mercury analysis using the lamps specified by the applicable DSAM;
 - The laboratory shall use absorption cells that measure at least 10 centimeters (cm) and have 2.5 cm quartz end windows, or their equivalent;
 - The laboratory shall use a vapor flow system including an air pump delivering one liter per minute, a heated drying unit or a tube containing 20 grams of magnesium perchlorate, and an aeration tube with coarse glass-frit; and
 - Because of the toxic nature of mercury vapor, the laboratory shall take precautions to avoid subjecting individuals to inhalation of the vapor. Therefore, when the samples are analyzed, the released mercury vapor shall be passed through an absorbing media, such as equal volumes of 0.1 N potassium permanganate (KMnO_4) and 10 percent sulfuric acid (H_2SO_4), or 0.025 percent iodine in a three percent potassium iodide (KI) solution, or specially treated charcoal that will absorb mercury vapor.
5. Inductively coupled plasma (ICP) spectrometers shall meet the following requirements:
- The laboratory's ICP instruments shall be computer-controlled;
 - The system shall be capable of background correction; and
 - The system shall include a computer data system that performs analog-digital conversions with integration, storage, and output. The laboratory shall produce completed header information for the computer system to define the unique sample, blank or standard run; the date and time of instrumental analysis; the analyst; and the parameter or parameters for which the sample is being analyzed.
6. Inductively coupled plasma/mass spectrometers (ICP/MS) shall meet the requirements applicable to ICP spectrometers under (a)5 above. The laboratory shall operate ICP/MS instrumentation using the mass spectrometer ionization conditions, scan range, and scan rate defined by the applicable DSAM, and shall meet the tuning criteria, initial and continuing calibration, quality assurance, and quality control requirements of the applicable DSAM.
7. Transmission electron microscopes and associated energy dispersive X-ray analyzers shall meet the requirements of the applicable DSAM.
8. Gas chromatographs shall meet the following requirements:
- GC Column ovens shall be capable of isothermal temperature control;
 - Injection systems, columns, and carrier gas flow control conditions shall meet the requirements of the applicable DSAM;
 - Detectors shall meet the requirements of the applicable DSAM;
 - Chromatograms shall be recorded with a strip chart recorder and integrator or combined recorder/integrator or computer data system; and
 - The original hard copy of all chromatograms shall meet the requirements of (a)14 below.
9. Gas chromatograph/mass spectrometers (GC/MS) shall meet the requirements for gas chromatographs in (a)8 above, and the requirements for mass spectrometers under (a)13 below.
10. High performance liquid chromatographs (HPLC) shall meet the following requirements:
- Isocratic and/or linear gradient elution chromatography shall be used;
 - Fluorescence, UV or electrochemical detectors shall be used, as required by the applicable DSAM;
 - Reverse-phase or other columns shall be used as prescribed by the applicable DSAM;
 - Chromatograms shall be recorded with a strip chart recorder and integrator or combined recorder/integrator or computer data system; and
 - The original hard copy of all chromatograms shall meet the requirements of (a)14 below.
11. High performance liquid chromatograph/mass spectrometers (HPLC/MS) shall satisfy the requirements for high performance liquid chromatographs in (a)10i, iii and iv above, and the requirements for mass spectrometers under (a)13 below.
12. Ion chromatographs shall meet the requirements defined by the DSAM including the following requirements:
- Suppressor and separator or other columns shall be used as required by the applicable DSAM;
 - Conductivity or other detector shall be used as required by the applicable DSAM;
 - Chromatograms shall be recorded with a strip chart recorder and integrator or combined recorder/integrator or computer data system; and

2. The laboratory shall calibrate standards incorporated in visual comparison devices at least once every six months. The laboratory shall maintain records of the date and method of each such calibration in accordance with N.J.A.C. 7:18-5.6. The laboratory shall prepare visual calibration standards according to the applicable DSAM. The laboratory shall plot concentrations of the calibration standards against those of the incorporated standards, and calculate a correction factor. The laboratory shall document this correction factor and apply it to all future results until the factor is redetermined at the next six-month interval;

3. The laboratory shall check the wavelength setting of each spectrophotometer at least annually, by comparing the wavelength setting to the absorption maxima of colored standards or filters such as didymium glass. For each check, the laboratory shall record in a log book the date on which it performed the check, the wavelength observed, and the correction factor. The record shall include the analyst's signature;

4. The laboratory shall prepare calibration curves used in the spectrophotometric analysis and ion-selective electrode analysis of inorganic parameters as follows:

i. When using new calibration standards or quarterly, the laboratory shall prepare new calibration curves consisting of at least one reagent blank and five standards. The calibration coefficient shall be >0.995 .

ii. The laboratory shall verify the calibration curve with the calibration check standard daily or after every 20 samples, whichever is more frequent. For analyses under the Drinking Water Program, the laboratory shall use a calibration check standard with a concentration at or near the maximum contaminant level (MCL). For analyses under other regulatory programs, the laboratory shall use a calibration check standard with a concentration at or near the middle of the concentration range of the calibration curve. If the applicable DSAM does not specify the permitted deviation, a verification is satisfactory only if the concentration as determined from the calibration curve is within a percent difference (PD) of 10 percent of the true concentration of the calibration check standard. If the PD is greater than 10 percent, the laboratory shall prepare a new calibration curve.

iii. The laboratory shall record all data used in determining the calibration curve, and have the record signed by the analyst. In the record, the laboratory shall include the date of calibration, identification and concentration standards;

5. The laboratory shall prepare calibration curves used in the analysis of metal parameters in Categories SDW02, SDW04, WPP02, WPP04, SHW04, SHW09. The laboratory shall follow the requirements for calibration curves in (c)4 above, except that a minimum of one reagent blank and three standards are required. When the laboratory

uses computer-controlled equipment, the laboratory shall follow the manufacturer's instructions for calibrating the instrument and shall verify the calibration curve with two calibration check standards, one at the low end of the concentration range and the other at the high end;

6. The laboratory shall analyze blanks at the frequencies required by the applicable DSAM;

7. For parameters in categories SDW02, SDW04, WPP02, WPP04, SHW04, SHW09, the laboratory shall conduct quality control (QC) check sample analyses to verify the accuracy of the analytical system for the parameter. For each QC check sample analysis, the laboratory shall record the results of the analysis, the date on which the verification analysis was performed, and the method of verification. The laboratory shall have the analyst who performed the analysis sign the record;

i. If the laboratory analyzes 20 or more samples in a calendar month, it shall analyze one QC sample for every 20 samples analyzed during the month. If the laboratory analyzes fewer than 20 samples in a calendar month, it shall analyze one QC sample during the month; and

ii. The laboratory shall calculate the percent recovery (% R) for each parameter in the QC sample. The % R shall be within the limits listed in the applicable DSAM. If the applicable DSAM does not list such limits, the laboratory shall calculate such limits from its experimental data, using the procedure in (c)9 below. If the % R is not within three standard deviations of the limits, the laboratory shall re-analyze the samples in question;

8. In all cases, the laboratory shall conduct matrix spike and matrix spike duplicate sample analyses to verify the accuracy and precision of the DSAM for the applicable parameters in the Categories SDW02, SDW04, WPP02, WPP04, SHW04, SHW09;

i. The laboratory shall verify the accuracy and precision of its analyses of parameters in the above categories. The laboratory shall maintain records of such verifications, signed by the analyst performing the verification. In the records, the laboratory shall include the date on which it performed the verification, the method of verification, and the results;

ii. If the laboratory analyzes 20 or more samples for any one parameter in a calendar month, it shall verify the accuracy and precision of such analyses on at least one of every 20 samples analyzed during the month. If the laboratory analyzes fewer than 20 samples for any one parameter in a calendar month, it shall verify the precision of the analysis once a month;

iii. The laboratory shall calculate the percent recovery (% R) for each matrix spike and the relative percent difference (RPD) between the matrix spike and matrix spike duplicate for each parameter. The % R

and RPD shall meet requirements of the applicable DSAM. If the method does not list limits for % R and RPD values, the laboratory shall establish these limits from its experimental data, using the procedure in (c)9 below;

9. In all cases, the laboratory shall calculate and document standard deviations for all applicable measurements conducted in Categories SDW02, SDW04, WPP02, WPP04, SHW04, SHW09, in accordance with the following requirements:

i. The laboratory shall calculate standard deviations for $n-1$ degrees of freedom (n samples—1) for all % R and RPD measurements in (c)7 and 8 above. For this calculation in connection with (c)7 above, the laboratory shall use ongoing data collected from the analysis of 10 QC samples; for this calculation in connection with (c)8 above, the laboratory shall use ongoing data collected from the analysis of 10 matrix, matrix spike pairs. For parameters in Category DW2 or DW4, the laboratory shall use samples that have been prepared at the MCL. For other parameters, the laboratory shall use samples that have been prepared to approximate the middle of the concentration range normally encountered in the analysis. The laboratory shall record the theoretical or true value. The laboratory shall calculate and plot the mean value, the warning limits (two standard deviations), and the corrective action limits (three standard deviations); and

ii. The laboratory shall record subsequent quality control results for each parameter, and compare the results against its control limits. The control limits shall be updated after a batch of 20 new measurements.

10. A certified environmental laboratory or a laboratory that is applying for certification shall determine its own MDLs in reagent water. MDL data are required for all DSAMs containing reference MDL data for which the laboratory possesses or is applying for certification. The laboratory shall make the MDL determinations in accordance with 40 CFR 136 Appendix B. The Office of Quality Assurance may require the laboratory to determine MDLs for any DSAMs for which it possesses certification. This data is required to support Water Technical Programs N.J.A.C. 7:9-4 and 6;

11. A certified environmental laboratory shall determine its MDL data (as stated in (c)10 above) annually. All regulatory sample data except CERCLA CLP shall include the most recent MDL values determined by the laboratory;

12. The laboratory shall maintain a permanent maintenance record containing the following information for each instrument:

- i. The date of instrument installation;
- ii. The date and a description of repairs, modifications, and preventive maintenance;

iii. The signature of the person performing the maintenance; and

iv. Chromatographic column information and installation date.

13. The laboratory shall maintain a bound notebook containing records of the preparation of standards. The laboratory shall include the following information in the records:

i. The manufacturer's name and lot number of reagent, date received, percent purity, name of chemical, concentrations if a solution;

ii. The identification number of the concentrated stock standard solution, date of preparation, expiration date, signature of the analyst who prepared the solution, all chemical compounds in the solution, purity, gross weight, tare weight, net weight, adjusted net weight (corrected for purity of primary standard) (only net weight and adjusted net weight are required when using balances with automatic tare features), dilution volume, and concentration in specified units;

iii. The identification number of the intermediate concentration standard solution (if needed), date of preparation, expiration date, signature of the analyst who prepared the solution, all chemical compounds in the solution, identification number of the concentrated stock, strength of concentrated stock, aliquot of concentrated stock, dilution volume, and final concentration in specified units; and

iv. The identification number of the working standard solution, date of preparation, expiration date, signature of the analyst who prepared the solution, all chemical compounds in the solution, identification number of the intermediate concentration standards, concentration of intermediate standards, aliquot volumes, dilution volumes, and final concentrations in specified units.

Amended by R.2001 d.224, effective July 2, 2001.
See: 33 N.J.R. 1063(a), 33 N.J.R. 2284(c).

In (c)5 and (c)7 through (c)9, amended categories.

Cross References

Duties of environmental laboratory personnel, see N.J.A.C. 7:18-2.11.

7:18-5.6 Requirements for records and data reporting

(a) The laboratory shall retain records concerning chemical analyses. The records to be retained include raw data records, quality control data records (including records of all quality control checks under N.J.A.C. 7:18-5.5(c)), chain-of-custody forms, laboratory reports, and the information required under (d) below. The laboratory shall retain each record for at least five years after the date of the analysis, provided however, that the laboratory shall retain records of analyses for 10 years if the person requesting the analyses has informed the laboratory that the analyses were to be performed because of epidemiological or public health concerns.

(b) The laboratory shall file and maintain data and other records in an accessible location on the laboratory's premises for one year after the date of analysis so that reviews can be conducted during on-site audits.

(c) The laboratory shall not accept custody of regulatory samples unless a chain-of-custody form is submitted with the samples, in accordance with N.J.A.C. 7:18-9.3(b)4.

1. Before accepting custody of a regulatory sample, the laboratory shall determine that the sample is properly labeled and has met the handling and preservation requirements. If the sample fails to meet those requirements, the laboratory shall indicate that failure on the chain-of-custody section of the sample request form or the chain-of-custody form;

2. The laboratory's sample custodian accepting responsibility for the sample shall sign the chain-of-custody form;

3. The laboratory shall have an internal chain-of-custody procedure or an alternate sample tracking procedure which establishes a sample's integrity and completely tracks its custody during its lifetime in the laboratory; and

4. If the analysis was not performed at the environmental laboratory that first received the sample, the chain-of-custody form shall include the name, address and identification number of the New Jersey certified environmental laboratory to which the sample was forwarded.

(d) The laboratory shall retain the following information as part of the records of analysis:

1. The assigned laboratory sample number or other unique form of identification;

2. The date and time of sample preparation and analysis;

3. The name and signature of the person or persons who performed the analysis;

4. The type of analysis performed and the DSAM used;

5. The results of the analysis and the raw data generated by the analysis, including any correction factors; and

6. The results of the initial calibrations, calibration check standards, and method quality control requirements.

(e) The laboratory shall check all results reported on final report forms against original data to make sure there are no transcription errors.

(f) If the laboratory discovers an error in the analysis of a regulatory sample, and the error may affect the validity of the reported analytical result, the environmental laboratory manager shall report the error to the regulatory program for which the analysis was conducted, and to the client. The laboratory shall make this notification within 72 hours after discovery of the error.

(g) The laboratory shall not report results of analyses to the Department or to any other person unless the original or true duplicate of the results is sent to the client. The report shall be signed by the laboratory manager or designee identified pursuant to N.J.A.C. 7:18-2.11(a)1iii.

(h) The laboratory shall not refer samples to another laboratory for analysis, unless the other laboratory is also a certified environmental laboratory. The laboratory requesting the analysis shall provide the results to the client, on the original or true duplicate forms from the certified environmental laboratory that performed the analysis, containing the New Jersey environmental laboratory identification number of the certified environmental laboratory that performed the analysis.

(i) When the laboratory determines that the concentration of nitrate, nitrite, or nitrate/nitrite in a regulatory drinking water sample exceeds the MCL, the laboratory shall notify the affected parties as follows:

1. For non-transient non-community and transient non-community water systems, the laboratory shall notify the water purveyor and the municipal health agency (or, if there is no municipal health agency for the municipality in question, the county health agency) within 24 hours or during the next business day; or

2. For community water systems, the laboratory shall notify the water system's superintendent and the Department's Bureau of Safe Drinking Water within 24 hours or during the next business day.

(j) The laboratory shall include at least the following information in reporting analyses for the Safe Drinking Water Program or the Water Pollution Program:

1. The certified environmental laboratory name and New Jersey laboratory identification number;

2. The date and time of sampling, sample preparation and analysis;

3. Specific and unique identification of the sample;

4. The type of analysis performed and the analytical method employed, including the method number;

5. The name of each parameter;

6. The dilution factor (DF), if the sample was diluted (for example, to reduce matrix interference);

7. The sample MDL. If the sample was diluted, the laboratory shall adjust the MDL to reflect the dilution. To calculate the adjusted MDL, the laboratory shall multiply the reagent water MDL by the DF;

8. The name and signature of the environmental laboratory manager or designee identified pursuant to N.J.A.C. 7:18-2.11(a)1iii; and

9. The results generated by the analysis, reported as a quantitative number with units of measurement (such as mg/L, micrograms/L, or micrograms/kg) or as "not detected" (ND).

(k) In addition to the information required under (j) above, the laboratory may report an extended list of target compounds if it meets the standardization and quality control requirements of the applicable DSAM and N.J.A.C. 7:18-5.5 for the additional parameters on the extended list.

(l) The laboratory shall include at least the following information in reporting analyses for the Solid/Hazardous Waste program or the CERCLA-CLP program:

1. The certified environmental laboratory name and New Jersey environmental laboratory identification number;
2. The date and time of sampling, sample preparation and analysis;
3. Specific and unique identification of the sample;
4. The type of analysis performed and the analytical method employed, including the method number;
5. The name of each parameter;
6. The dilution factor (DF), if the factor was diluted (for example, to reduce matrix interference);
7. The sample MDL. If the sample was diluted, the laboratory shall adjust the MDL to reflect the dilution. To calculate the adjusted MDL, the laboratory shall multiply the reagent water MDL by the DF. MDL values are not required for CLP reporting;
8. The name and signature of the environmental laboratory manager or designee identified pursuant to N.J.A.C. 7:18-2.11(a)liiii; and
9. The results of the analysis, to be reported as specified in the DSAM.

(m) In addition to the information required under (l) above, the laboratory may report an extended list of target compounds if it meets the standardization and quality control requirements of the applicable DSAM and N.J.A.C. 7:18-5.5 for the additional parameters on the extended list.

SUBCHAPTER 6. RADIOCHEMICAL TESTING PROCEDURES INCLUDING RADON GAS/RADON PROGENY

7:18-6.1 Scope

(a) This subchapter applies to certified environmental laboratories when performing radiochemical testing or radon/radon progeny-in-air testing on regulatory samples, and to other laboratories performing radiochemical testing or radon/radon progeny-in-air testing on PE samples to become certified. This subchapter applies to radiochemical testing and radon/radon progeny-in-air testing for parameters in the following categories:

1. Drinking Water Program:
 - i. Category SDW07, Radiochemistry: Radioactivity & Radionuclide Parameters; and
 - ii. Category SDW08, Radon in Drinking Water for the Safe Drinking Water Program;
2. Water Pollution Program:
 - i. Category WPP09, Radiochemistry: Radioactivity & Radionuclide Parameters; and
 - ii. Category WPP10, Radon in Wastewater for Water Pollution Control Program; and
3. Radon/Radon Progeny-in-Air Program: Category RAP01, Radon/Radon Progeny-in-Air Parameters for the Radon Act Program.

(b) In addition to satisfying the applicable requirements of N.J.A.C. 7:18-1 through 3, a laboratory performing radiochemical testing within the scope of (a) above shall follow:

1. All applicable requirements in this subchapter; and
2. All requirements specified in the applicable DSAMs, including without limitation any requirements that are more stringent than the requirements in this subchapter.

Amended by R.2001 d.224, effective July 2, 2001.

See: 33 N.J.R. 1063(a), 33 N.J.R. 2284(c).

In (a), amended categories.

7:18-6.2 Requirements for radiochemistry environmental laboratory facilities

(a) The laboratory shall not perform radiochemical testing unless its facilities meet the requirements of (a)1 and 2 below, the applicable requirements of N.J.A.C. 7:18-3, and the requirements of the applicable DSAM.

1. The laboratory shall properly ground counting instruments required to measure activities or specific radionuclides described in 40 CFR 141, Methods for the Safe Drinking Water Act. The laboratory shall have available a regulated power supply, either external or internal, for use with each such instrument. The laboratory shall not locate any such instruments:
 - i. In a room in which samples and standards are being prepared; or
 - ii. In a room in which other types of chemical analyses are being performed.
2. To avoid contamination of work surfaces and personnel in areas in which radioactive standards are being prepared, the laboratory shall use work surfaces meeting the requirements of (a)2i or ii below:
 - i. Bench surfaces of an impervious material covered with absorbent paper; or

ii. Trays constructed of stainless steel, plastic, or fiberglass and lined with absorbent paper.

7:18-6.3 Requirements for radiochemistry laboratory equipment and instruments

(a) The supervisor shall have control over the equipment and instruments used in radiochemical testing and radon/radon progeny-in-air testing. The laboratory shall have equipment and instruments that satisfy the applicable requirements listed in (a)1 and 2 below, in (b) and (c) below, in N.J.A.C. 7:18-3, and in the applicable DSAM.

1. The laboratory shall have a muffle furnace that:

i. Is automatically controlled;

ii. Has a chamber capacity of at least 2,200 cubic centimeters (cc), and measures at least 10 centimeters (cm) by 9.5 cm by 23 cm; and

iii. Has a maximum operating temperature of 1,000 degrees Celsius continuous and 1,100 degrees Celsius intermittent; and

2. The laboratory shall have a general purpose table-top centrifuge that has a maximum speed of at least 3,000 revolutions per minute (rpm) and a loading option of 4 x 50 mL.

(b) A laboratory performing measurements involving radiation counting (as set forth in 40 CFR 141 and required by the Federal Safe Drinking Water Act) shall have the instruments meeting the requirements in (b)1 through 6 below and the requirements of the applicable DSAM:

1. The laboratory shall have a liquid scintillation system to measure tritium in drinking water samples or radon in drinking water or wastewater samples. The system shall meet or exceed the sensitivity requirements of 40 CFR 141.25;

2. The laboratory shall have a gas-flow proportional counting system (as described in the reference cited in 40 CFR 141.25(a)) to measure gross alpha and gross beta activities, radium-226, radium-228, strontium-89, strontium-90, cesium-134, and iodine-131. The detector shall be either a "windowless" (internal proportional counter) or a "thin window" type. A combination of shielding and a cosmic (guard) detector operated in anticoincidence with the main detector shall be used to achieve low background beta counting capability. The alpha and beta background count of the system shall be such that the sensitivity of the radiochemical analysis of the water sample will meet or exceed the requirements of 40 CFR 141.25 with a reasonable counting time of not more than 1,000 minutes (16.6 hrs);

3. Instead of the gas-flow proportional counter described in (b)2 above, a laboratory may use a scintillation system designed for alpha counting to measure gross alpha activities and radium-226. When the laboratory uses a scintillation system for counting, it shall follow the sample setup for measurement described in EPA 600-4-80-032, Appendix D, item 2;

4. The laboratory shall have a scintillation cell system designed to accept scintillation flasks ("Lucas cells") to specifically measure radium-226 by the radon emanation method. The system consists of a light-tight enclosure capable of accepting the scintillation flasks, a detector (phototube), a high voltage supply, an amplifier, timers, and scalers. The laboratory shall either purchase the flasks (cells) required for this measurement from commercial suppliers, or construct the flasks (cells) in accordance with the specifications set forth in Lucas, H.F., "Improved Low-Level Alpha Scintillation Counter for Radon". Rev. Sci. Instrum., 28:680, 1967;

5. The laboratory shall have a gamma spectrometer system equipped with one of the following to analyze manmade photon emitters:

i. A sodium iodide NaI(Tl) crystal detector that:

(1) Uses a NaI(Tl) crystal measuring at least 7.5 cm x 7.5 cm (though the Department recommends using a crystal measuring 10 cm x 10 cm);

(2) Is shielded with at least 10 cm of iron or the equivalent thereof;

(3) Has sufficient distance from the center of the detector to other part of the shield (the Department recommends a distance of at least 30 cm); and

(4) Has a multichannel analyzer with a memory of not less than 200 channels and at least one readout device for each system;

ii. A solid state lithium drifted germanium detector that meets the requirements of (b)5ii(1) and (2) below, or a gamma-X photon detector that meets the requirements of (b)5ii(1), (2) and (3) below:

(1) The detector shall be sufficiently efficient to make the gamma spectrometry system sensitive enough to meet the minimum detectable activity requirements cited in 40 CFR 141.25;

(2) The detector shall be shielded with at least 10 cm of iron or the equivalent thereof; and

(3) The gamma-X photon detector shall be connected to a multichannel analyzer that has a memory of at least 2,000 channels and at least one readout device for each system; and

6. The laboratory shall have a fluorometer capable of detecting 0.5 nanogram (ng) of uranium for the analysis of uranium by the fluorometric method.

(c) A laboratory certified to perform measurements involving radiation counting (as set forth in the Radon Act) shall meet the following requirements when performing radon/radon progeny-in-air analyses:

1. If required by the authorized measurement protocols, the laboratory shall use a microscope or automated counting system capable of detecting and counting alpha tracks. A laboratory performing an analysis with a radon progeny-in-air integrating sampling unit (RPISU) shall use a thermoluminescent dosimeter (TDL) reader; and

2. To analyze manmade photon emitters, the laboratory shall use a gamma spectrometer system equipped as described under (b)5 above.

7:18-6.4 Required use of DSAMs

(a) In performing radiochemical analysis of a regulatory sample (including, without limitation, analysis of a PE sample by a laboratory that is applying to become certified), a laboratory shall use only:

1. A DSAM from the applicable Category listed in N.J.A.C. 7:18-6.1(a) for which the laboratory is certified; or

2. An applicable ATP approved by the Department pursuant to N.J.A.C. 7:18-2.20 for the laboratory and, if applicable, for the facility in question.

(b) The requirements of (a) above do not apply to the analysis of a non-regulatory sample, if the requirements of N.J.A.C. 7:18-2.22(b) are satisfied.

7:18-6.5 Requirements for general radiochemical environmental laboratory practices

(a) A laboratory shall meet the following requirements with respect to laboratory standards, wastes, samples, reagents and solutions used in radiochemical analysis:

1. The laboratory shall store radioactive standards and radioactive wastes in an enclosed and properly labeled area, either within the analytical environmental laboratory or in a separate room or facility. The laboratory shall store standards, samples, and radioactive wastes safely in containers that protect against flammability and against contamination of the laboratory;

2. The laboratory shall prepare standards and samples in an area of the environmental laboratory specifically designated for and exclusively used for the preparation of radioactive standards and samples. The laboratory shall take adequate precautions in this area to ensure against radioactive contamination. The laboratory shall provide for safe storage and disposal of radioactive wastes and shall monitor the work area for radioactivity;

3. The laboratory shall label all reagents and reagent solutions to indicate identity and, when applicable, titer, strength or concentration, recommended storage requirements, preparation, expiration date, and any other pertinent information;

4. The laboratory shall immediately discard any reagent or reagent solution that is past its expiration date; and

5. The laboratory shall not use materials of substandard reactivity or deteriorated materials.

7:18-6.6 Requirements for quality assurance/quality control program

(a) The laboratory shall develop and keep current a quality assurance/quality control manual. The laboratory shall not perform analyses of regulatory samples without having a current quality assurance/quality control manual covering the analysis in question. In the manual, the laboratory shall describe the following:

1. The procedures that the laboratory will use in meeting the quality control requirements of this subchapter, N.J.A.C. 7:18-3, and all applicable DSAMs, including but not limited to requirements pertaining to laboratory equipment, instrumentation and supplies; and

2. The frequency with which the laboratory will perform the procedures listed pursuant to (a)1 above.

(b) The laboratory shall develop and implement a written methods manual containing a standard operating procedure (SOP) for each DSAM, in accordance with the criteria and procedures of the DSAM and this chapter. A laboratory shall not perform analyses using a DSAM unless it has developed and implemented such an SOP for the DSAM.

1. The laboratory shall update the manual to reflect any changes in the procedures practiced by the laboratory.

2. The laboratory shall keep copies of the methods manual in the immediate bench area of personnel engaged in the analysis of samples and related procedures within the radon/radon progeny-in-air categories.

3. In the manual, the laboratory shall properly designate by revision number and date the standard operating procedure (SOP) for a specified analytical method for a particular type of analysis.

4. Changes to SOPs are effective only if:

i. The change is made by the manager, supervisor or quality assurance officer of the laboratory; and

ii. The manager, supervisor or quality assurance officer makes the change in writing, signed and dated by the manager, supervisor or quality assurance officer.

5. The laboratory shall make manufacturers' instruction manuals and any applicable regulations readily available to laboratory personnel at all times. Textbooks may be used to supplement written instructions, but shall not be used in lieu thereof.

(c) A laboratory performing radiochemical testing shall conduct the quality control checks specified in the applicable DSAMs, and take the additional measures listed in (c)1 through 6 below. The laboratory shall maintain permanent records of preventive maintenance, periodic inspection, testing, and calibration for the proper operation of radiation instruments and remedial actions taken in response to detected defects. The laboratory shall maintain daily quality control performance charts and performance records for each instrument.

1. The laboratory shall calibrate each radon/radon progeny-in-air measurement device and technique before putting it into service. The laboratory shall recalibrate each such device and technique at least once every 12 months, and after any repair or modification;

2. For radon/radon progeny-in-air analysis, the laboratory shall record and maintain all information specified by the authorized measurement protocols and methods described in the DSAM and this subchapter;

3. Each day, the laboratory shall perform 10 percent duplicate analyses to verify internal environmental laboratory precision;

4. Before beginning a series of specific analyses, the laboratory shall measure a counting standard and a background standard. Thereafter, the laboratory shall make repeat measurements of the counting standard and background standard after every 20 samples have been measured;

5. During each day in which the laboratory performs fewer than 20 specific analyses, the laboratory shall measure one counting standard and background sample; and

6. The laboratory shall keep all radiochemical instruments in good repair. The laboratory shall maintain factory service contracts for such instruments, or employ an electronics technician qualified to repair and maintain such instruments.

Cross References

Duties of environmental laboratory personnel, see N.J.A.C. 7:18-2.11.

ix. Upon completing the toxicity test, the laboratory shall send the original or true duplicate of the results to the client. The original or true duplicate shall be signed by the laboratory manager or a designee identified under N.J.A.C. 7:18-2.11(a)1iii.

Administrative change.

See: 28 N.J.R. 4098(a).

Amended by R.1997 d.192, effective May 19, 1997.

See: 28 N.J.R. 4149(a), 29 N.J.R. 2275(a).

In (a)1, inserted "or N.O.A.E.C."; and added (b)6.

7:18-7.7 Laboratory quality control and recordkeeping

(a) A laboratory performing acute toxicity testing shall develop and implement a quality control program. The laboratory shall not perform acute toxicity testing without having such a program. The laboratory shall have a written description of its program on file and be able to produce a copy during an on-site inspection. The written description shall include all methods manuals used for culturing test organisms, and all testing protocols used by the laboratory. The quality control program description, or standard operating procedures (SOP) manual, shall be specific to the operations of the laboratory and not a generalized document.

(b) The laboratory shall make records of all analytical control tests and quality control checks on equipment and materials. The laboratory shall maintain the records for at least five years. The laboratory shall file and maintain data and other records in an accessible location on the laboratory's premises for one year after the date of analysis so that reviews can be conducted during on-site audits.

(c) If the laboratory discovers an error in the analysis of a regulatory sample, and the error may affect the validity of the reported analytical result, the environmental laboratory manager shall report the error to the regulatory program for which the analysis was conducted, and to the client. The laboratory shall make this notification within 72 hours after discovery of the error.

(d) Laboratories performing acute toxicity testing shall comply with the following requirements when performing quality control checks of laboratory media, equipment, and supplies:

1. Operate each pH meter in accordance with N.J.A.C. 7:18-3.3(a)3. Rinse the probe with laboratory pure water immediately after each use period. Label commercial buffer solutions with the date of receipt and the date of initial use;
2. Operate top loader or pan balances in accordance with N.J.A.C. 7:18-3.3(a)2;
3. Verify all temperature measuring devices using the procedures listed in N.J.A.C. 7:18-3.3(a)5;
4. The temperature of air or water-jacketed incubators, aluminum block incubators, water baths, and incuba-

tor rooms shall be recorded either continuously or daily from in-place thermometers immersed in liquid and placed on at least one of the shelves in use. Keep the records in a log book, signed and dated by the analyst;

5. Record date, time, pressure and temperature of an autoclave either continuously, or individually during each sterilization cycle. Keep the records in a log book, signed and dated by the analyst;

6. The time and temperature of hot air ovens shall be measured with a thermometer either continuously or individually during each cycle, with the bulb of the thermometer placed in sand. Record the date, time and temperature of each cycle. Keep the records in a log book, signed and dated by the analyst;

7. Monitor the temperature of each refrigerator in accordance with the procedures listed in N.J.A.C. 7:18-3.3(a)7;

8. Label all reagents and solutions to indicate identity and, when applicable, titer, strength or concentration, manufacturer's recommended storage requirements, preparation and expiration date, and other information pertinent to identification. Do not use materials of sub-standard reactivity or deteriorated materials. Discard all outdated material immediately;

9. At least annually, check conductivity and salinity meters equipped with conductivity cells having platinum electrodes. Perform the check over the range of interest using at least five concentrations of a standard potassium chloride solution. Check conductivity cells not having platinum electrodes against a conductivity meter equipped with platinum electrodes. Perform this check annually and record the raw data, cell constant, and results in a log book, signed and dated by the analyst; and

10. Check dissolved oxygen meters weekly, using the Winkler method. Record the results in a log book signed and dated by the analyst.

(e) Only the laboratory manager, supervisor or quality assurance officer is authorized to make changes in laboratory procedures. Changes are effective only if:

1. The change is made by the manager, supervisor or quality assurance officer of the laboratory;
2. The manager, supervisor or quality assurance officer makes the change in writing, signed and dated by the manager, supervisor or quality assurance officer, and includes the change in the laboratory's SOP manual.

(f) A laboratory shall not perform acute toxicity tests unless it keeps current laboratory SOP and reference manuals in the immediate bench area of laboratory personnel engaged in examining samples and performing toxicity testing and other related procedures. The laboratory may use textbooks to supplement the manuals, but shall not replace

the manuals with the textbooks. The manuals shall include information relating to:

1. The analytical methods to be used, properly designated and dated to reflect the most recent supervisory reviews; and
2. Any applicable regulations.

(g) A laboratory conducting a flow-through toxicity test shall check the temperature in the exposure chambers, the flow rate through the exposure chambers, and the maintenance of effluent concentrations. The laboratory shall conduct these checks when the test is initiated, at least once every 24 hours for the duration of the test, and upon completion of the test. The laboratory shall document these measurements, and any resulting adjustments to the flow-through dilutor system, in the toxicity test report.

(h) A laboratory performing an acute toxicity test shall establish an acute toxicity test precision requirement that the 95 percent confidence interval be within ± 30 percent of the estimated or incipient EC_{50} or LC_{50} value.

(i) A laboratory performing acute toxicity tests shall keep records and report data in accordance with the requirements of (i)1 and 2 below. The records to be retained include raw data records, quality control data records, chain-of-custody forms, laboratory reports, and the information required under (i)2 below.

1. The laboratory shall retain each record for at least five years after the date of the analysis. The laboratory shall file and maintain data and other records in an accessible location on the laboratory's premises for one year after the date of analysis so that reviews can be conducted during on-site audits.

2. The laboratory shall record the following information as part of the daily log of feeding, behavioral observations, and mortality of organisms during holding and acclimation:

- i. The water temperature of holding tanks;
- ii. The air temperature in the culturing/holding room;
- iii. Mortalities or organisms per holding tank;
- iv. The analysis of laboratory grade waters as specified in N.J.A.C. 7:18-7.4(b);
- v. The food and feeding schedule; and
- vi. General observations of behavior and condition.

(j) The laboratory shall not accept custody of regulatory samples unless a chain-of-custody form is submitted with the samples, in accordance with N.J.A.C. 7:18-9.5(c).

1. Before accepting custody of a regulatory sample, the laboratory shall determine that the sample is properly labeled and has been collected, preserved, processed, stored and transported in accordance with the provisions of this subchapter. If the sample fails to meet those requirements, the laboratory shall indicate that failure on the chain-of-custody section of the sample request form or the chain-of-custody form;

2. The laboratory's sample custodian accepting responsibility for the sample shall sign the chain-of-custody form;

3. The laboratory shall have an internal chain-of-custody procedure or an alternate sample tracking procedure which establishes the integrity and completely tracks the custody of a sample during its lifetime in the laboratory; and

4. If the analysis was not performed at the environmental laboratory that first received the sample, the chain-of-custody form shall include the name, address and identification number of the New Jersey certified environmental laboratory to which the sample was forwarded.

(k) If a laboratory violates any of the requirements of this subchapter in the process of performing an acute toxicity test, the laboratory shall prefix the test result, that is, LC_{50} or EC_{50} value, with the letter "J," and describe the violation in the "remarks" section of the test report.

Cross References

Duties of environmental laboratory personnel, see N.J.A.C. 7:18-2.11.

SUBCHAPTER 8. ANALYZE IMMEDIATELY ENVIRONMENTAL MEASUREMENTS

7:18-8.1 Scope and general requirements

(a) This subchapter applies to certified environmental laboratories when performing analyze-immediately environmental measurements on regulatory samples, and to other laboratories performing analyze-immediately environmental measurements on PE samples to become certified. This subchapter applies to environmental measurements of parameters in the following categories (including, but not limited to, chlorine dioxide, dissolved oxygen with probe, pH, ozone, residual chlorine, sulfite and temperature):

1. Drinking Water Program—Category SDW03, Inorganic Parameters, Analyze—Immediately (<15 min);
2. Water Pollution Program—Category WPP03, Inorganic Parameters, Analyze—Immediately (<15 min); and
3. Solid/Hazardous Waste Program—Category SHW03, Analyze—Immediately Parameters.

(b) In addition to satisfying the applicable requirements of N.J.A.C. 7:18-1 through 3, a laboratory performing analyze-immediately environmental measurements within the scope of (a) above shall follow:

1. All applicable requirements in this subchapter; and
2. All requirements specified in the applicable DSAMs, including without limitation any requirements that are more stringent than the requirements in this subchapter.

(c) A laboratory performing environmental measurements of a sample for parameters listed in (a)1, 2 or 3 above shall analyze the sample within 15 minutes after collection. The laboratory may perform the analysis in the field, in an on-site mobile laboratory, or in a facility laboratory (such as a laboratory at a wastewater treatment plant).

Amended by R.2001 d.224, effective July 2, 2001.

See: 33 N.J.R. 1063(a), 33 N.J.R. 2284(c).

In (a), amended categories.

7:18-8.2 Requirements for environmental laboratory equipment, supplies, and materials

The supervisor shall have control over the equipment, supplies and materials used in analyze-immediately testing and analysis of regulatory samples. The equipment, supplies and materials shall be sufficient to perform those tests and analyses, and shall meet the requirements of N.J.A.C. 7:18-3, 7:18-5 and the applicable DSAM.

7:18-8.3 Required use of techniques specified in DSAMs

(a) In performing an analyze-immediately analysis of a regulatory sample (including, without limitation, analysis of a PE sample by a laboratory that is applying to become certified), a laboratory shall use only:

1. A DSAM from the applicable Category listed in N.J.A.C. 7:18- 8.1(a) for which the laboratory is certified; or
2. An ATP approved by the Department for the laboratory and, if applicable, for the facility in question.

(b) The requirements of (a) above do not apply to the analysis of a non-regulatory sample, if the requirements of N.J.A.C. 7:18-2.22(b) are satisfied.

7:18-8.4 Requirements for quality assurance/quality control program

(a) The laboratory shall develop and keep current a quality assurance/quality control manual. The laboratory shall not perform analyses of regulatory samples without having a current quality assurance/quality control manual covering the analysis in question. In the manual, the laboratory shall describe the following:

1. The procedures that the laboratory will use in meeting the quality control requirements of this subchap-

ter, N.J.A.C. 7:18-3 and 5, and all applicable DSAMs, including without limitation requirements pertaining to laboratory equipment and instrumentation, supplies, and the frequency with which such procedures shall be performed; and

2. The frequency with which the laboratory will perform the procedures listed pursuant to (a)1 above.

(b) The laboratory shall develop and implement a written methods manual containing a standard operating procedure (SOP) for each DSAM, in accordance with the criteria and procedures of the DSAM and this chapter. A laboratory shall not perform analyses using a DSAM unless it has developed and implemented such an SOP for the DSAM.

1. The laboratory shall update the manual to reflect any changes in the procedures practiced by the laboratory.

2. The laboratory shall keep copies of the methods manual in the immediate bench area of personnel engaged in the analysis of samples and related procedures within the Chemical Testing Categories.

3. In the manual, the laboratory shall properly designate by revision number and date the standard operating procedure (SOP) for a specified analytical method for a particular type of analysis.

4. Changes to SOPs are effective only if:

- i. The change is made by the manager, supervisor or quality assurance officer of the laboratory; and
- ii. The manager, supervisor or quality assurance officer makes the change in writing, signed and dated by the manager, supervisor or quality assurance officer.

(c) A laboratory performing analyze-immediately environmental measurements shall conduct the quality control checks specified in the applicable DSAMs.

Cross References

Duties of environmental laboratory personnel, see N.J.A.C. 7:18-2.11.

7:18-8.5 Requirements for records and data reporting

(a) The laboratory shall retain records concerning "analyze immediately" analyses. The records to be retained include raw data records, quality control data records, chain-of-custody forms, laboratory reports, and the information required under (d) below. The laboratory shall retain each record for at least five years after the date of the analysis, provided however, that the laboratory shall retain records of analyses for 10 years if the person requesting the analyses has informed the laboratory that the analyses were to be performed because of epidemiological or public health concerns.

(b) The laboratory shall file and maintain data and other records in an accessible location on the laboratory's premis-

es for one year after the date of analysis so that reviews can be conducted during on-site audits.

(c) The laboratory shall retain the following information as part of the records of analysis:

1. The assigned laboratory sample number or other unique form of identification;
2. The date and time of sample analysis;
3. The name and signature of the person or persons who collected the sample;
4. The name and signature of the person or persons who analyzed the sample;
5. The type of analysis performed and the DSAM used; and
6. The results of the analysis and the raw data generated by the analysis.

(d) The laboratory shall check all results reported on final report forms against original data to make sure there are no transcription errors.

(e) The laboratory shall include the following information in reporting results to the client:

1. The certified environmental laboratory name and New Jersey laboratory identification number;
2. The date, time, and location of sample collection and sample analysis;
3. The type of analysis performed and the analytical method employed;
4. The results generated by the analysis; and
5. The name and signature of the environmental laboratory manager or designee identified under N.J.A.C. 7:18-2.11(a)1iii.

(f) The laboratory shall not report results of analyses to the Department or to any other person unless the original or true duplicate of the results is sent to the client. The report shall be signed by the laboratory manager or designee identified under N.J.A.C. 7:18-2.11(a)1iii.

SUBCHAPTER 9. SAMPLE REQUIREMENTS

7:18-9.1 Scope and general requirements

(a) This subchapter applies to certified environmental laboratories when:

1. Handling and preserving regulatory samples for microbiological, inorganic, organic, radiochemical, and acute toxicity testing;
2. Collecting regulatory samples for acute toxicity testing; and
3. Accepting regulatory samples that have been collected, handled or preserved by persons other than the laboratory.

(b) If the laboratory is collecting, handling or preserving regulatory samples within the scope of (a) above, the laboratory shall comply with the requirements of this subchapter. If the laboratory does not comply with those requirements, it shall not submit results of the analysis of the sample for regulatory purposes.

(c) If the laboratory is accepting any regulatory sample within the scope of (a) above that has been collected, handled or preserved by a person other than the laboratory, the laboratory shall obtain reasonable assurance (including, but not limited to, a complete and properly signed chain-of-custody form) that the sample has been collected, preserved and handled in accordance with this subchapter. If the laboratory is unable to obtain this assurance for a sample, it shall not submit results of the analysis of the sample for regulatory purposes. The laboratory shall reject any such sample, and request a new sample. The laboratory shall verbally notify the client of this action within 24 hours after rejecting the sample, and provide the client with written confirmation of this action within five business days after rejecting the sample.

7:18-9.2 Requirements for microbiological parameter samples

(a) For regulatory samples that are to be analyzed for microbiological parameters to demonstrate compliance with the drinking water program:

1. The requirements of (c) below shall be satisfied;
2. Sample containers, preservation techniques, and holding times shall satisfy the requirements under N.J.A.C. 7:18-9.4(b)1 and Table 9.1; and
3. Collection, handling, and preservation of drinking water samples to be analyzed on behalf of a water purveyor shall adhere to the sampling, identification, and transfer procedures described in the latest edition of Standard Methods approved by the USEPA. If there is any conflict between the collection, handling and preservation requirements in Standard Methods and the corresponding requirements in this subchapter, the requirements in Standard Methods shall control.

(b) For regulatory samples that are to be analyzed for microbiological parameters to demonstrate compliance with the water pollution program:

1. The requirements of (c) below shall be satisfied; and

2. Sample containers, preservation techniques, and holding times shall satisfy the requirements under N.J.A.C. 7:18-9.4(c) and Table 9.2.

(c) In addition to the requirements of Table 9.1 or 9.2, as applicable, the requirements listed in (c)1 through 13 below shall be satisfied for samples to be analyzed for one or more microbiological parameters. The requirements listed in (c)1 through 13 below are incorporated from the USEPA's "Microbiological Methods for Monitoring the Environment, Water and Wastes," EPA-600/8-78-017. If there are any conflicts between the USEPA publication and (c)1 through 13 below, the USEPA publication shall control.

1. The sample volume shall be at least 100 mL;
2. The sample container shall not be filled completely, to allow adequate air space for mixing;
3. The sample container shall have a capacity of at least 120 mL. The sample container shall be one of the following:
 - i. A wide-mouthed hard glass and leakproof sample bottle;
 - ii. A plastic sample bottle or container with a leak-proof cap; or
 - iii. A pre-sterilized plastic bag;
4. Glass-stoppered bottles shall be stored so that they are protected from contamination by dust and the glass stoppers shall be covered with either aluminum foil or kraft paper;
5. Caps shall have leakproof nontoxic liners that are capable of withstanding repeated sterilizations, at temperatures of 121 degrees Celsius sustained for 30 minutes per sterilization;
6. Sample containers shall have sodium thiosulfate (0.1 mL of 10 percent (weight/volume) solution per 120 mL capacity) added prior to sterilization;
7. When collecting samples known to contain heavy metals, add ethylenediamine tetra acetic acid (EDTA) (0.3 mL of a 15% (weight/volume) solution per 120 mL capacity bottle) to the sample container prior to sterilization;
8. The collector shall complete a sample analysis request form immediately after collection. The collector shall state the following on the form:
 - i. That sterilized containers with preservative were used for sampling;
 - ii. The collector's name and affiliation;
 - iii. Name and identification number of the environmental laboratory analyzing the sample;

- iv. Sample location and type;
- v. Date and time of collection;
- vi. Chlorine residual results, if applicable;
- vii. Preservatives or preservation conditions used;
- viii. DSAMs to be performed; and
- ix. Collector's signature and any remarks.

9. Unless the requirements of (c)13 below are satisfied, a chain-of-custody form shall be completed. The form shall provide space for the sample analysis request information listed in (c)8 above. The following chain-of-custody procedures shall be employed, and the following information shall be recorded by each person who collects or handles a regulatory sample:

i. Use tie-on or affixed labels with sample identification to label the sample; and

ii. After the sample has been collected, the collector shall write the following information on the chain-of-custody form:

(1) The information required under (c)8i through viii above;

(2) Signature, date and time of chain-of-custody transfers; and

(3) Number of containers;

10. When sending samples by mail or private shipping service, the collector shall complete the chain-of-custody form before shipping, and place it into the shipping container. The container shall have a numbered custody seal;

11. Samples shall be stored in iced coolers at four degrees Celsius during transit to the certified environmental laboratory and refrigerated upon delivery until such analyses can be performed;

12. A certified environmental laboratory shall not accept a sample unless it is properly labelled, and for which assurance is given that the sample has been collected, preserved, processed, stored and transported in a manner that will assure the identity of the sample and that the sample is sufficiently stable to be used in the requested tests or analyses; and

13. A formal chain-of-custody procedure is not required if:

i. The collector and the analyst are the same person; and

ii. The collector enters in the field log book all of the information required under (c)8 above.

Administrative change.
See: 28 N.J.R. 4098(a).

7:18-9.3 Requirements for inorganic, organic, and radiochemical parameter samples

(a) Regulatory samples to be analyzed for one or more inorganic, organic or radiochemical parameters shall be handled and preserved as follows:

1. Drinking water samples to be analyzed for one or more inorganic or organic parameters shall be handled and preserved in accordance with the applicable requirements of Table 9.1 in N.J.A.C. 7:18-9.4(b);

2. Wastewater samples to be analyzed for one or more chemical parameters shall be handled and preserved in accordance with the applicable requirements in Table 9.2 in N.J.A.C. 7:18-9.4(c);

3. Solid/hazardous waste samples (aqueous matrices) to be analyzed for one or more chemical parameters shall be handled and preserved in accordance with the applicable requirements in Table 9.2 in N.J.A.C. 7:18-9.4(c);

4. Drinking water samples to be analyzed for one or more radiochemical parameters shall be handled and preserved in accordance with the applicable requirements of Table 9.3 in N.J.A.C. 7:18-9.4(d);

5. Wastewater samples to be analyzed for one or more radiochemical parameters shall be handled and preserved in accordance with the applicable requirements in Table 9.4 in N.J.A.C. 7:18-9.4(e);

6. Solid/hazardous waste samples in the form of soils, liquids, sediments, and sludges shall be handled and preserved in accordance with the applicable requirements in Table 9.5 in N.J.A.C. 7:18-9.4(f); and

7. CERCLA-CLP aqueous and non-aqueous samples shall be handled and preserved in accordance with the applicable requirements in Table 9.6 in N.J.A.C. 7:18-9.4(g).

(b) In addition to the requirements of Tables 9.1 through 9.6 in N.J.A.C. 7:18-9.4, as applicable, the following requirements apply to the handling and preservation of regulatory samples to be analyzed for one or more chemical parameters. Pre-preserved bottles may be used, but the pH of regulatory samples must be checked and adjusted as outlined below if the pH is not ≤ 2 before shipped to the laboratory. If proper preservation is not obtained, follow the procedure as outlined in this subsection.

1. To preserve a sample (other than a sample to be analyzed for volatile organics) by pH adjustment:

i. Add an acid or base preservative to the sample. Do not add preservative in an amount that will dilute the sample and give inaccurate results;

ii. Replace the stopper or closure on the sample bottle and mix the sample thoroughly by inverting the bottle several times;

iii. Remove the sample bottle stopper or closure and place a drop of the sample from the stopper onto pH test paper;

iv. Rinse the portion of the stopper exposed to the pH paper with Type II water;

v. If the proper pH has not been obtained, repeat steps (b)1i through iv above; and

vi. Transport samples requiring cooling at four degrees Celsius in an ice chest, shuttle, or cooler containing crushed ice or other suitable coolant capable of reducing the ice chest temperature to four degrees Celsius and maintaining this temperature during transport.

2. To use pH adjustment to preserve a sample that is to be analyzed for volatile organics:

i. Collect the sample in a 40 mL or larger glass Teflon®-lined septum vials;

ii. Add a dechlorination agent if residual chlorine is present;

iii. Prior to filling sample vials, determine the appropriate amount of 1:1 HCl necessary to lower the sample pH to 2 by filling a separate representative vial with the sample. Record the amount of acid needed to reach a pH of about 2. Add this amount of 1:1 HCl to each successive 40 mL or larger vial collected;

iv. Add 1:1 hydrochloric acid (HCl) at time of collection;

v. Fill the vial with sample to the point of overflowing (zero head space), place the screw cap containing a Teflon®-faced silicone septum on the vial, and secure it tightly;

vi. Position the silicone septum in the cap so that the Teflon® side will lie face down on the water sample;

vii. Inspect the vial for any air bubbles. If bubbles are present, remove the cap and add more sample to the vial, replace the cap, and inspect the vial for bubbles again. Repeat until no bubbles are present;

viii. If effervescence occurs when the HCl is added, omit acid preservation of sample. If acid preservation is prohibited by effervescence, the sample must be analyzed within seven days of collection; and

ix. Maintain the sample at four degrees Celsius in an ice chest or shuttle containing ice or other suitable coolant capable of reducing the ice chest or shuttle to four degrees Celsius.

3. A sample analysis request form stating the following information shall be completed immediately after collection:

i. The collector's name and affiliation;

- ii. The name and identification number of the laboratory analyzing the sample;
 - iii. The sample location and type;
 - iv. The date and time of collection;
 - v. The chlorine residual results, if applicable;
 - vi. The preservatives or preservation conditions used;
 - vii. DSAMs to be performed; and
 - viii. The collector's signature and any remarks.
4. Unless the requirements of (b)6 below are satisfied, a chain-of-custody form shall be completed. The form shall provide space for the information listed in (b)3 above. The following chain-of-custody procedures shall be employed, and the following information recorded, in collecting and handling regulatory samples:
- i. Document that the proper decontaminated containers are used for sampling;
 - ii. Use tie-on or affixed labels with an identification number to identify all samples; and
 - iii. After the sample has been collected, the collector shall write the following information on the chain-of-custody form:
 - (1) The collector's name and affiliation;
 - (2) The name and identification number of the laboratory analyzing the sample;
 - (3) The sample location and type;
 - (4) The date and time of collection;
 - (5) The signature, date and time of chain-of-custody transfers;
 - (6) The number of containers;
 - (7) The chlorine residual results, if applicable;
 - (8) The preservatives or preservation conditions used; and
 - (9) DSAMs to be performed.
5. When sending samples by mail or by private shipping, the collector shall complete the chain-of-custody form before shipping, and place it into the shipping container. The container shall have a numbered custody seal.
6. A formal chain-of-custody procedure is not needed in the following circumstances:
- i. The collector and the analyst are the same person; and
 - ii. All of the information required under (b)3 above is entered in the field log book.

Cross References

Duties of environmental laboratory personnel, see N.J.A.C. 7:18-2.11.

7:18-9.4 Requirements for sample handling and preservation for specific parameters

(a) A laboratory shall handle and preserve samples in accordance with the following requirements:

1. All sample bottles for aqueous samples shall be precleaned before arriving on site.

2. All sample bottles used for taking grab samples, except for prepreserved bottles, shall be rinsed with sample water at least twice before being filled, unless the sample is to be analyzed for any of the following:

- i. Petroleum hydrocarbons;
- ii. Oil and grease;
- iii. Pesticides;
- iv. PCB, PBB and herbicides;
- v. Bacteriological;
- vi. Dissolved oxygen;
- vii. Volatile organics; or
- viii. Metals.

3. After rinsing, the sample bottle shall be filled with the sample using a minimum of agitation.

4. Fill the sample bottle completely if the sample is to be analyzed for purgeable organics, oxygen demand, hydrogen sulfide, hardness, ferrous iron, acidity, or alkalinity.

5. For samples to be analyzed for parameters other than those listed in (a)4 above, leave at least one inch of air space at the top of the sample bottle.

6. If a sample is to be analyzed for bacteriological parameters, collect it directly in a presterilized sample container.

7. If a sample is to be analyzed for oil and grease or for petroleum hydrocarbons, the following procedure shall be followed:

- i. Collect the sample directly into the sample bottle;
- ii. Use a one-liter glass bottle fitted with a Teflon®-lined screw cap or ground glass stopper;
- iii. Leave a one-inch air space inside the sample bottle. Do not overflow the sample bottle allowing the oil and grease phase to flow out of the bottle;
- iv. Do not transfer the sample into another bottle for analysis;
- v. Use all of the sample, rather than an aliquot portion of the sample, for analysis.

vi. Before taking the sample from a closed conduit via a valve or faucet arrangement, allow enough water to flush through the valve or faucet prior to filling the bottle in order to obtain a representative sample;

vii. Representative grab samples taken from an open channel must be obtained at one of the following locations:

(1) Where the Froude number equals or exceeds 1 at the time of sampling and at least 90 percent of the time when a discharge exists. The Froude number is computed according to the following formula:

$$Fr = \frac{V}{\sqrt{gy}}$$

Where:

Fr = Froude number (dimensionless);

V = mean velocity of the fluid in the channel, in feet per second;

g = the acceleration of gravity (32.2ft/sec²); and

y = Vertical depth of flow, in feet;

(2) Immediately downstream of a hydraulic jump; or

(3) From a sampling point located immediately after a V-notch weir, properly installed as a flow measuring device.

viii. Representative grab samples taken from a closed conduit must be obtained at a point where the Reynolds number exceeds 4,000 at the time of sampling and at least 90 percent of the time when a discharge exists. The Reynolds number is computed according to the following formula:

$$R = \frac{Vd}{\nu}$$

Where:

R = Reynolds number (dimensionless);

V = mean velocity of the fluid in the pipe, in feet per second;

d = diameter of the pipe, in feet; and

ν = kinematic viscosity, in feet² per second, using the applicable value for ν listed below based on the temperature of the discharge.

Temperature	ν
32°F	1.931 ft ² /sec × 10 ⁻⁵
40°F	1.664 ft ² /sec × 10 ⁻⁵
50°F	1.410 ft ² /sec × 10 ⁻⁵
60°F	1.217 ft ² /sec × 10 ⁻⁵
70°F	1.059 ft ² /sec × 10 ⁻⁵
80°F	0.930 ft ² /sec × 10 ⁻⁵
90°F	0.826 ft ² /sec × 10 ⁻⁵
100°F	0.739 ft ² /sec × 10 ⁻⁵
110°F	0.667 ft ² /sec × 10 ⁻⁵
120°F	0.609 ft ² /sec × 10 ⁻⁵

ix. The discharger shall document the sampling methodology, and shall make the documentation available to the Department.

x. Samples to be analyzed for oil and grease or petroleum hydrocarbons may be collected pursuant to an alternate sampling protocol approved in writing by the Department. The Department shall not approve an alternate sampling protocol unless it determines that the alternate protocol will result in the collection of representative samples.

8. Samples to be analyzed for pesticides, herbicides or PCBs, shall be collected in bottles at least one liter in size, which have been cleaned to remove all traces of these compounds and then rinsed with pesticide grade solvents before drying.

(b) Drinking water samples shall be handled and preserved in accordance with the requirements of Table 9.1 and the requirements of (b)1 through 5 below. Table 9.1 includes applicable requirements from 40 CFR 141.23, 141.24 and 143.4, and from the USEPA's September 1992 "Labcert Bulletin," EPA-814-k-92-002. If there is any conflict between Table 9.1 and the USEPA rule or publication (including any amendments or supplements) on which any part of Table 9.1 is based, the USEPA rule or publication shall control.

1. Table 9.1 requires the use of concentrated nitric acid (HNO₃) for the preservation of samples to be analyzed for copper or lead. If HNO₃ cannot be used because of shipping restrictions, the sample shall be shipped to the laboratory immediately, at ambient temperature. Upon receipt, the sample shall be acidified with Conc. HNO₃ to pH <2 and held for at least 16 hours before analysis.

2. The laboratory shall analyze each sample as soon after collection as possible. The laboratory shall not analyze a sample after the maximum holding time listed in Table 9.1 has elapsed since collection.

3. Samples to be analyzed for asbestos, fecal coliform, total coliform, fecal streptococci, total cyanide, cyanide amenable to chlorination, acenaphthene, acrolein, acrylonitrile, anthracene, benzene, benzidine, benzo(a)anthracene or benzo(a)pyrene shall never be frozen.

4. For samples to be analyzed for chlorinated hydrocarbons, chlorophenoxys, cyanide, purgeable organic compounds, volatile aromatic and unsaturated organic compounds, volatile halogenated organic compounds, ascorbic acid may be used only in the presence of residual chlorine.

5. When Table 9.1 lists the maximum holding time as "Analyze-Immediately," the laboratory shall analyze the sample within 15 minutes after collection.

Table 9.1

Required Containers, Preservation Techniques, and Holding Times for Drinking Water Samples, Except Radiochemical Parameters

Parameter	Preservation	Container ("P" means plastic, hard or soft; "G" means glass, hard or soft.)	Maximum Holding Time
Total Coliform	Cool 4°C, 0.08% sodium thiosulfate (Na ₂ S ₂ O ₃)	P or G	30 hours
Alkalinity	Cool 4°C	P or G	14 days
Antimony	Conc HNO ₃ to pH < 2	P or G	6 months
Arsenic	Conc HNO ₃ to pH < 2	P or G	6 months
Asbestos	Cool 4°C	P or G	Filter within 48 hours
Barium	Conc HNO ₃ to pH < 2	P or G	0:00
Beryllium	Conc HNO ₃ to pH < 2	P or G	0:00
Cadmium	Conc HNO ₃ to pH < 2	P or G	6 months
Calcium	Conc HNO ₃ to pH < 2	P or G	6 months
Chloride	None	P or G	28 days
Chlorinated Hydrocarbons	Refrigerate at 4°C after collection, Ascorbic acid	Glass with foil or Teflon®-lined cap	14 days until extraction; 40 days after extraction
Chlorinated Pesticides	80mg/L Na ₂ S ₂ O ₃ (if residual chlorine (Cl ₂) is present) Cool 4°C	Glass with Teflon®- lined septum	7 days until extraction; 14 days after extraction
Chlorinated phenoxy Acids	80mg/L Na ₂ S ₂ O ₃ (if residual Cl ₂) Cool 4°C	Glass with Teflon®- lined septum	14 days until extraction; 28 days after extraction
Chlorine dioxide	None	P or G	Analyze Immediately
Chlorinated Acids	Refrigerate at 4°C after collection, Ascorbic acid	Glass with foil or Teflon®-lined cap	7 days until extraction; 30 days after extraction
Chromium	Conc HNO ₃ to pH < 2	P or G	6 months
Copper	Conc HNO ₃ to pH < 2	P or G	6 months
Cyanide	NaOH to pH > 12, Cool 4°C, 0.6 g ascorbic acid	P or G	14 days
EDB/DBCP	Cool 4°C 0.08% Na ₂ S ₂ O ₃ (if residual Cl ₂) 1:1 HCl to pH < 2	Glass with Teflon®- lined septum	28 days
Fluoride	None	P	28 days
Free Chlorine Residual	None	P or G	Analyze Immediately
Lead	Conc HNO ₃ to pH < 2	P or G	6 months
Mercury	Conc HNO ₃ to pH < 2	P or G	28 days
N-Methyl- Carbamoyloximes N- Methyl-Carbamates	Monochloroacetic acid to pH 3 80mg/L Na ₂ S ₂ O ₃ , Cool 4°C until storage, Store at -10°C	Glass with Teflon®- lined septum	28 days at -10°C
Nickel	Conc HNO ₃ to pH < 2	P or G	6 months
Nitrate Chlorinated	Cool 4°C	P or G	28 days
Nitrate Non-chlorinated	Conc H ₂ SO ₄ to pH < 2	P or G	14 days
Nitrite	Cool 4°C	P or G	48 hours
Nitrogen- and Phosphorus- Containing Pesticides	80mg/L Na ₂ S ₂ O ₃ (if residual Cl ₂) Cool 4°C	Glass (dark) with Teflon®-lined septum	14 days until extraction; 14 days after extraction
o-Phosphate	Filter immediately, Cool 4°C	P or G	48 hours
Organic Compounds	If residual Cl ₂ 40-50 mg sodium arsenite or sodium thiosulfate; if unchlorinated 6 N HCl to pH < 2	Glass with Teflon®- lined septum	7 days until extraction; 30 days after extraction
Organohalide Pesticides and Commercial PCB Products (Arochlors)	3mg Na ₂ S ₂ O ₃ or 7uL Na ₂ S ₂ O ₃ (0.04g/mL), Cool 4°C until analyzed	Glass with Teflon®- lined septum	If Heptachlor, 7 days until extraction; 40 days after extraction. If no extraction analysis 14 days
Ozone	None	G	Analyze Immediately
pH	None	P or G	Analyze Immediately
Selenium	Conc HNO ₃ to pH < 2	P or G	6 months
Silver	Conc HNO ₃ to pH < 2	P or G	6 months
Sodium	Conc HNO ₃ to pH < 2	P or G	6 months
Sulfate	Cool 4°C	P or G	28 days

<u>Parameter</u>	<u>Preservation</u>	<u>Container</u> ("P" means plastic, hard or soft; "G" means glass, hard or soft.)	<u>Maximum Holding</u> <u>Time</u>
Temperature	None	P or G	Analyze <u>Immediately</u>
Thallium	Conc HNO ₃ to pH < 2	P or G	6 months
TTHMs	Na ₂ S ₂ O ₃ if residual Cl ₂ and 6N HCl	Glass with Teflon®- lined septum	14 days
Total Dissolved Solids	Cool 4°C	P or G	7 days
Turbidity	Cool 4°C	P or G	48 hours
Volatile Aromatic and Unsaturated Organic Compounds	1:1 HCl to pH < 2 Cool, 4°C until analysis, Ascorbic acid	Glass with Teflon®- lined septum	14 days
Volatile Halogenated Organic Compounds	1:1 HCl to pH < 2 Cool, 4°C until analysis, Ascorbic acid	Glass with Teflon®- lined septum	14 days
Volatile Organic Compounds	1:1 HCl to pH < 2 Cool, 4°C until analysis, Ascorbic acid	Glass with Teflon®- lined septum	14 days

(c) Wastewater samples and solid/hazardous waste samples (aqueous matrices) shall be handled and preserved in accordance with the requirements of Table 9.2 and the requirements of (c)1 through 3 below. Table 9.2 includes applicable requirements from 40 CFR 136.3 and the USEPA's Test Methods for Evaluating Solid Waste—Physical and Chemical Methods, Third Edition 1986, as updated (referred to below as "SW-846"). If there is any conflict between Table 9.2 and the USEPA rule or publication (including any amendments or supplements) on which any part of Table 9.2 is based, the USEPA rule or publication shall control.

1. The laboratory shall perform sample preservation immediately after collecting each sample. For composite chemical samples, each aliquot shall be preserved at the time of collection, unless the use of an automated sampler makes it impossible to preserve each aliquot. In that case, chemical samples may be preserved by maintaining at four degrees Celsius until compositing and sample splitting is completed.

2. Shipping of any sample by common carrier or through the United States Mail shall be in accordance with the United States Department of Transportation's hazardous materials regulations at 49 CFR Part 172 (as such regulations are amended and supplemented). These regulations do not apply to the following materials required to be used for sample preservation: Hydrochloric acid (HCl) in water solutions at concentrations of 0.04 percent by weight or less (pH about 1.96 or greater); Nitric acid (HNO₃) in water solutions at concentrations of 0.15 percent by weight (pH of about 1.62 or greater); Sulfuric acid (H₂SO₄) in water solutions at concentrations of 0.35 percent by weight (pH of about 1.15 or greater); and Sodium Hydroxide (NaOH) in water solutions at concentrations of 0.080 percent by weight (pH of about 12.30 or less).

3. The laboratory shall analyze each sample as soon after collection as possible. Except as provided in (c)3i or ii below, the laboratory shall not analyze a sample after the maximum holding time listed in Table 9.2 has elapsed since collection.

i. If the laboratory has reason to believe that a sample will not be stable for the applicable maximum holding time, it shall analyze the sample within a shorter time during which the sample will remain stable;

ii. If the laboratory or the permittee has received a variance from the USEPA Regional Administrator authorizing a holding time that is longer than the applicable maximum in Table 9.2, and the laboratory or the permittee has data on file showing that the type of sample in question is stable for such a longer time, the laboratory shall analyze the sample within such longer time; or

iii. If SW-846 or the USEPA rules at 40 CFR 136.3 specifies a maximum holding time that differs from the time specified in Table 9.2, the laboratory shall not analyze a sample after the maximum holding time specified in SW-846 or 40 CFR 136.3, as applicable.

Table 9.2

Required Containers, Preservation Techniques, and Holding Times for Wastewater Samples and Solid/Hazardous Waste Samples (Aqueous Matrices), Except Radiochemical Parameters

<u>Parameter</u>	Container ("P" means plastic, hard or soft; "G" means glass, hard or soft.)	<u>Preservation</u>	<u>Maximum Holding Time</u>
Bacterial Tests:			
Coliform (fecal)	P, G	Cool 4°C, 0.008% Na ₂ S ₂ O ₃	6 hours
Coliform (total)	P, G	Cool 4°C, 0.008% Na ₂ S ₂ O ₃	6 hours
Fecal streptococci	P, G	Cool 4°C, 0.008% Na ₂ S ₂ O ₃	6 hours
Inorganic Tests			
Acidity, as CaCO ₃	P, G	Cool 4°C	14 days
Alkalinity as CaCO ₃	P, G	Cool 4°C	14 days
Aluminum-total ³	P, G	HNO ₃ to pH < 2	6 months
Ammonia (as N)	P, G	Cool 4°C H ₂ SO ₄ to pH < 2	28 days
Antimony-total ³	P, G	HNO ₃ to pH < 2	6 months
Arsenic-total ³	P, G	HNO ₃ to pH < 2	6 months
Barium-total ³	P, G	HNO ₃ to pH < 2	6 months
Beryllium-total ³	P, G	HNO ₃ to pH < 2	6 months
Biochemical Oxygen Oxygen Demand	P, G	Cool 4°C	48 hours
Boron-total ³	P, G	HNO ₃ to pH < 2	6 months
Bromide ³	P, G	None required	28 days
Cadmium-total ³	P, G	HNO ₃ to pH < 2	6 months
Calcium-total ³	P, G	HNO ₃ to pH < 2	6 months
Carbonaceous Biochemical Oxygen Demand	P, G	Cool 4°C	48 hours
Chemical Oxygen Demand (COD)	P, G	Cool 4°C H ₂ SO ₄ to pH < 2	28 days
Chloride	P, G	None required	28 days
Chlorine total residual (TRC)	P, G	None required	Analyze Immediately
Chromium VI (dissolved)	P, G	Cool 4°C	24 hours
Chromium-total ³	P, G	HNO ₃ to pH < 2	6 months
Cobalt-total ³	P, G	HNO ₃ to pH < 2	6 months
Color	P, G	Cool 4°C	48 hours
Copper-total ³	P, G	HNO ₃ to pH < 2	6 months
Cyanide-total ³	P, G	Cool 4°C, NaOH to pH > 12 0.6g ascorbic acid	14 days (24 hours when sulfide is present) ²
Cyanide amenable to chlorination ³	P, G	Cool 4°C, NaOH to pH > 12 0.6g ascorbic acid	14 days (24 hours when sulfide is present) ²
Fluoride	P	None required	28 days
Gold-total ³	P, G	HNO ₃ to pH < 2	6 months
Hardness-total as CaCO ₃	P, G	HNO ₃ to pH < 2, H ₂ SO ₄ to pH < 2	6 months
Hydrogen ion (pH)	P, G	None required	Analyze Immediately
Iridium-total ³	P, G	HNO ₃ to pH < 2	6 months
Iron-total ³	P, G	HNO ₃ to pH < 2	6 months
Kjeldahl & Organic Nitrogen	P, G	Cool, 4°C, H ₂ SO ₄ to pH < 2	28 days
Lead-total ³	P, G	HNO ₃ to pH < 2	6 months
Magnesium-total ³	P, G	HNO ₃ to pH < 2	6 months
Manganese-total ³	P, G	HNO ₃ to pH < 2	6 months
Mercury-total ³	P, G	HNO ₃ to pH < 2	28 days
Molybdenum-total ³	P, G	HNO ₃ to pH < 2	6 months
Nickel-total ³	P, G	HNO ₃ to pH < 2	6 months
Nitrate (as N)	P, G	Cool 4°C	48 hours

<u>Parameter</u>	<u>Container</u> ("P" means plastic, hard or soft; "G" means glass, hard or soft.)	<u>Preservation</u>	<u>Maximum Holding</u> <u>Time</u>
Nitrate-Nitrite (as N)	P, G	Cool 4°C, H ₂ SO ₄ to pH < 2	28 days
Nitrite (as N)	P, G	Cool 4°C	48 hours
Oil and grease	G	Cool 4°C, HCl or H ₂ SO ₄ to pH < 2	28 days
Organic carbon-total (TOC)	P, G	Cool 4°C, HCl or H ₂ SO ₄ to pH < 2 or phosphoric acid	28 days
Orthophosphate (as P)	P, G	Filter Immediately, Cool 4°C	48 hours
Osmium-total ³	P, G	HNO ₃ to pH < 2	6 months
Oxygen dissolved (probe)	Glass bottle and top	None Required	Analyze Immediately
Oxygen dissolved (Winkler)	Glass bottle and top	Fix on site and store in dark	8 hours
Palladium-total ³	P, G	HNO ₃ to pH < 2	6 months
Petroleum Hydrocarbons	G	HCl to pH 2	7 days
Phenols	G only	Cool 4°C, H ₂ SO ₄ to pH < 2	28 days
Phosphorus (elemental)	G	Cool 4°C	48 hours
Phosphorus-total	P, G	Cool 4°C, H ₂ SO ₄ to pH < 2	28 days
Platinum-total ³	P, G	HNO ₃ to pH < 2	6 months
Potassium-total ³	P, G	HNO ₃ to pH < 2	6 months
Residue-total	P, G	Cool 4°C	7 days
Residue-filterable (TDS)	P, G	Cool 4°C	7 days
Residue-nonfilterable (TSS)	P, G	Cool 4°C	7 days
Residue-settleable	P, G	Cool 4°C	48 hours
Residue-volatile	P, G	Cool 4°C	7 days
Rhodium-total ³	P, G	HNO ₃ to pH < 2	6 months
Ruthenium-total ³	P, G	HNO ₃ to pH < 2	6 months
Salinity	G	Cool 4°C	28 days
Selenium-total ³	P, G	HNO ₃ to pH < 2	6 months
Silica-dissolved	P	Cool 4°C	28 days
Silver-total ³	P, G	HNO ₃ to pH < 2	6 months
Sodium-total ³	P, G	HNO ₃ to pH < 2	6 months
Specific conductance	P, G	Cool 4°C	28 days
Sulfate	P, G	Cool 4°C	28 days
Sulfide	P, G	Cool 4°C, add zinc acetate & NaOH to pH > 9	7 days
Sulfite	P, G	None required	Analyze Immediately
Surfactants	P, G	Cool 4°C	48 hours
Temperature	P, G	None required	Analyze Immediately
Thallium-total ³	P, G	HNO ₃ to pH < 2	6 months
Tin-total ³	P, G	HNO ₃ to pH < 2	6 months
Titanium-total ³	P, G	HNO ₃ to pH < 2	6 months
Turbidity	P, G	Cool 4°C	48 hours
Vanadium-total ³	P, G	HNO ₃ to pH < 2	6 months
Zinc-total ³	P, G	HNO ₃ to pH < 2	6 months
Organic Tests ⁴ Acenaphthene ⁷	Glass, Teflon®- lined cap	Cool 4° C, 0.008% Na ₂ S ₂ O ₃ Store in dark	7 days until extraction; 40 days after extraction
Acenaphthylene ⁷	Glass, Teflon®- lined cap	Cool 4°C, 0.008% Na ₂ S ₂ O ₃ Store in dark	7 days until extraction; 40 days after extraction
Acrolein	Glass, Teflon®- lined septum	Cool 4°C, 0.008% Na ₂ S ₂ O ₃ Adjust pH to 4-5 ⁶	14 days
Acrylonitrile	Glass, Teflon®- lined septum	Cool 4°C, 0.008% Na ₂ S ₂ O ₃ Adjust pH to 4-5 ⁶	14 days ⁶

<u>Parameter</u>	Container ("P" means plastic, hard or soft; "G" means glass, hard or soft.)	<u>Preservation</u>	<u>Maximum Holding Time</u>
Anthracene ⁷	Glass, Teflon®-lined cap	Cool 4°C, 0.008% Na ₂ S ₂ O ₃	7 days until extraction; 40 days after extraction
Benzene	Glass, Teflon®-lined septum	Cool 4°C, 0.008% Na ₂ S ₂ O ₃	14 days
Benzidine ⁷	Glass, Teflon®-lined cap	HCl to pH 2 Cool 4°C, 0.008% Na ₂ S ₂ O ₃	7 days until extraction ⁸
Benzo(a)anthracene ⁷	Glass, Teflon®-lined cap	Cool 4°C, 0.008% Na ₂ S ₂ O ₃	7 days until extraction; 40 days after extraction
Benzo(a)pyrene ⁷	Glass, Teflon®-lined cap	Store in dark Cool 4°C, 0.008% Na ₂ S ₂ O ₃ ¹	7 days until extraction; 40 days after extraction
Benzo(b)fluoranthene ⁷	Glass, Teflon®-lined cap	Store in dark Cool 4°C, 0.008% Na ₂ S ₂ O ₃ ¹	7 days until extraction; 40 days after extraction
Benzo(g,h,i)perylene ⁷	Glass, Teflon®-lined cap	Store in dark Cool 4°C, 0.008% Na ₂ S ₂ O ₃ ¹	7 days until extraction; 40 days after extraction
Benzo(k)fluoranthene ⁷	Glass, Teflon®-lined cap	Store in dark Cool 4°C, 0.008% Na ₂ S ₂ O ₃ ¹	7 days until extraction; 40 days after extraction
Benzyl chloride	Glass, Teflon®-lined septum	Cool 4°C, 0.008% Na ₂ S ₂ O ₃ ¹	14 days
Benzyl butyl phthalate ⁷	Glass, Teflon®-lined cap	Cool 4°C	7 days until extraction; 40 days after extraction
Bis(2-chloroethoxy) methane ⁷	Glass, Teflon®-lined cap	Cool 4°C, 0.008% Na ₂ S ₂ O ₃ ¹	7 days until extraction; 40 days after extraction
Bis(2-chloroethyl) ether ⁷	Glass, Teflon®-lined cap	Cool 4°C, 0.008% Na ₂ S ₂ O ₃ ¹	7 days until extraction; 40 days after extraction
Bis(2-ethylhexyl) phthalate ⁷	Glass, Teflon®-lined cap	Cool 4°C,	7 days until extraction; 40 days after extraction
Bromodichloromethane	Glass, Teflon®-lined septum	Cool 4°C, 0.008% Na ₂ S ₂ O ₃ ¹	14 days
Bromoform	Glass, Teflon®-lined septum	HCl to pH 2 ⁵ Cool 4°C, 0.008% Na ₂ S ₂ O ₃ ¹	14 days
Bromomethane	Glass, Teflon®-lined septum	HCl to pH 2 ⁵ Cool 4°C, 0.008% Na ₂ S ₂ O ₃ ¹	14 days
4-Bromophenylphenyl ether ⁷	Glass, Teflon®-lined cap	HCl to pH 2 ⁵ Cool 4°C, 0.008% Na ₂ S ₂ O ₃ ¹	7 days until extraction; 40 days after extraction
Carbon tetrachloride	Glass, Teflon®-lined septum	Cool 4°C, 0.008% Na ₂ S ₂ O ₃ ¹	14 days
4-Chloro-3-methylphenol ⁷	Glass, Teflon®-lined cap	HCl to pH 2 ⁵ Cool 4°C, 0.008% Na ₂ S ₂ O ₃ ¹	7 days until extraction; 40 days after extraction
Chlorobenzene	Glass, Teflon®-lined septum	Cool 4°C, 0.008% Na ₂ S ₂ O ₃ ¹	14 days
Chloroethane	Glass, Teflon®-lined septum	HCl to pH 2 ⁵ Cool 4°C, 0.008% Na ₂ S ₂ O ₃ ¹	14 days
2-Chloroethylvinyl ether	Glass, Teflon®-lined septum	HCl to pH 2 ⁵ Cool 4°C, 0.008% Na ₂ S ₂ O ₃ ¹	14 days
Chloroform	Glass, Teflon®-lined septum	HCl to pH 2 ⁵ Cool 4°C, 0.008% Na ₂ S ₂ O ₃ ¹	14 days
Chloromethane	Glass, Teflon®-	HCl to pH 2 ⁵ Cool 4°C,	14 days

<u>Parameter</u>	Container ("P" means plastic, hard or soft; "G" means glass, hard or soft.)	<u>Preservation</u>	<u>Maximum Holding Time</u>
	lined septum	0.008% Na ₂ S ₂ O ₃ ¹ HCl to pH 2 ⁵ Cool 4°C	
2-Chloronaphthalene ⁷	Glass, Teflon®-lined cap	Cool 4°C, 0.008% Na ₂ S ₂ O ₃ ¹	7 days until extraction; 40 days after extraction
2-Chlorophenol ⁷	Glass, Teflon®-lined cap	Cool 4°C, 0.008% Na ₂ S ₂ O ₃ ¹	7 days until extraction; 40 days after extraction
4-Chlorophenylphenyl ether ⁷	Glass, Teflon®-lined cap	Cool 4°C, 0.008% Na ₂ S ₂ O ₃ ¹	7 days until extraction; 40 days after extraction
Chrysene ⁷	Glass, Teflon®-lined cap	Cool 4°C, 0.008% Na ₂ S ₂ O ₃ ¹ Store in dark	7 days until extraction; 40 days after extraction
Dibenzo(a,h)anthracene ⁷	Glass, Teflon®-lined cap	Cool 4°C, 0.008% Na ₂ S ₂ O ₃ ¹ Store in dark	7 days until extraction; 40 days after extraction
Dibromochloromethane	Glass, Teflon®-lined septum	Cool 4°C, 0.008% Na ₂ S ₂ O ₃ ¹ HCl to pH 2 ⁵	14 days
1,2-Dichloro-benzene ⁷	Glass, Teflon®-lined septum	Cool 4°C, 0.008% Na ₂ S ₂ O ₃ ¹ HCl to pH 2 ⁵	14 days
1,3-Dichloro-benzene ⁷	Glass, Teflon®-lined septum	Cool 4°C, 0.008% Na ₂ S ₂ O ₃ ¹ HCl to pH 2 ⁵	14 days
1,4-Dichloro-benzene ⁷	Glass, Teflon®-lined septum	Cool 4°C, 0.008% Na ₂ S ₂ O ₃ ¹ HCl to pH 2 ⁵	14 days
3,3'-Dichlorobenzidine ⁷	Glass, Teflon®-lined septum	Cool 4°C, 0.008% Na ₂ S ₂ O ₃ ¹	14 days
Dichlorodifluoromethane	Glass, Teflon®-lined septum	Cool 4°C, 0.008% Na ₂ S ₂ O ₃ ¹	14 days
1,1-Dichloroethane	Glass, Teflon®-lined septum	Cool 4°C, 0.008% Na ₂ S ₂ O ₃ ¹ HCl to pH 2 ⁵	14 days
1,2-Dichloroethane	Glass, Teflon®-lined septum	Cool 4°C, 0.008% Na ₂ S ₂ O ₃ ¹ HCl to pH 2 ⁵	14 days
1,1-Dichloroethene	Glass, Teflon®-lined septum	Cool 4°C, 0.008% Na ₂ S ₂ O ₃ ¹ HCl to pH 2 ⁵	14 days
trans-1,2-Dichloroethene	Glass, Teflon®-lined septum	Cool 4°C, 0.008% Na ₂ S ₂ O ₃ ¹ HCl to pH 2 ⁵	14 days
2,4-Dichlorophenol ⁷	Glass, Teflon®-lined cap	Cool 4°C, 0.008% Na ₂ S ₂ O ₃ ¹	7 days until extraction; 40 days after extraction
1,2-Dichloropropane	Glass, Teflon®-lined septum	Cool 4°C, 0.008% Na ₂ S ₂ O ₃ ¹ HCl to pH 2 ⁵	14 days
cis-1,3-Dichloropropene	Glass, Teflon®-lined septum	Cool 4°C, 0.008% Na ₂ S ₂ O ₃ ¹ HCl to pH 2 ⁵	14 days
trans-1,3-Dichloropropene	Glass, Teflon®-lined septum	Cool 4°C, 0.008% Na ₂ S ₂ O ₃ ¹ HCl to pH 2 ⁵	14 days
Diethyl phthalate ⁷	Glass, Teflon®-lined cap	Cool 4°C	7 days until extraction; 40 days after extraction
2,4-Dimethylphenol ⁷	Glass, Teflon®-lined cap	Cool 4°C, 0.008% Na ₂ S ₂ O ₃ ¹	7 days until extraction; 40 days after extraction
Dimethyl phthalate	Glass, Teflon®-lined cap	Cool 4°C	7 days until extraction; 40 days after extraction
Di-n-butyl phthalate ⁷	Glass, Teflon®-lined cap	Cool 4°C	7 days until extraction; 40 days after extraction

<u>Parameter</u>	Container ("P" means plastic, hard or soft; "G" means glass, hard or soft.)	<u>Preservation</u>	<u>Maximum Holding Time</u>
Di-n-octyl phthalate ⁷	Glass, Teflon®-lined cap	Cool 4°C	7 days until extraction; 40 days after extraction
2,3-Dinitrophenol ⁷	Glass, Teflon®-lined cap	Cool 4°C, 0.008% Na ₂ S ₂ O ₃ ¹	7 days until extraction; 40 days after extraction
2,4-Dinitrotoluene ⁷	Glass, Teflon®-lined cap	Cool 4°C, 0.008% Na ₂ S ₂ O ₃ ¹ Store in dark	7 days until extraction; 40 days after extraction
2,6-Dinitrotoluene ⁷	Glass, Teflon®-lined cap	Cool 4°C, 0.008% Na ₂ S ₂ O ₃ ¹ Store in dark	7 days until extraction; 40 days after extraction
Epichlorohydrin	Glass, Teflon®-lined septum	Cool 4°C, 0.008% Na ₂ S ₂ O ₃ ¹	14 days
Ethylbenzene	Glass, Teflon®-lined septum	Cool 4°C, 0.008% Na ₂ S ₂ O ₃ ¹ HCl to pH 2 ⁵	14 days
Fluoranthene ⁷	Glass, Teflon®-lined cap	Cool 4°C, 0.008% Na ₂ S ₂ O ₃ ¹ Store in dark	7 days until extraction; 40 days after extraction
Fluorene ⁷	Glass, Teflon®-lined cap	Cool 4°C, 0.008% Na ₂ S ₂ O ₃ ¹ Store in dark	7 days until extraction; 40 days after extraction
Hexachlorobenzene ⁷	Glass, Teflon®-lined cap	Cool 4°C	7 days until extraction; 40 days after extraction
Hexachlorobutadiene ⁷	Glass, Teflon®-lined cap	Cool 4°C	7 days until extraction; 40 days after extraction
Hexachlorocyclopentadiene ⁷	Glass, Teflon®-lined cap	Cool 4°C	7 days until extraction; 40 days after extraction
Hexachloroethane ⁷	Glass, Teflon®-lined cap	Cool 4°C	7 days until extraction; 40 days after extraction
Ideno(1,2,3-cd)pyrene ⁷	Glass, Teflon®-lined cap	Cool 4°C, 0.008% Na ₂ S ₂ O ₃ ¹ Store in dark	7 days until extraction; 40 days after extraction
Isophorone ⁷	Glass, Teflon®-lined cap	Cool 4°C, 0.008% Na ₂ S ₂ O ₃ ¹ Store in dark	7 days until extraction; 40 days after extraction
Methylene chloride	Glass, Teflon®-lined septum	Cool 4°C, 0.008% Na ₂ S ₂ O ₃ ¹ HCl to pH 2 ⁵	14 days
2-Methyl-4,6-dinitrophenol ⁷	Glass, Teflon®-lined septum	Cool 4°C, 0.008% Na ₂ S ₂ O ₃ ¹	7 days until extraction; 40 days after extraction
Naphthalene ⁷	Glass, Teflon®-lined cap	Cool 4°C, 0.008% Na ₂ S ₂ O ₃ ¹ Store in dark	7 days until extraction; 40 days after extraction
Nitrobenzene ⁷	Glass, Teflon®-lined cap	Cool 4°C, 0.008% Na ₂ S ₂ O ₃ ¹ Store in dark	7 days until extraction; 40 days after extraction
2-Nitrophenol ⁷	Glass, Teflon®-lined cap	Cool 4°C, 0.008% Na ₂ S ₂ O ₃ ¹	7 days until extraction; 40 days after extraction
4-Nitrophenol ⁷	Glass, Teflon®-lined cap	Cool 4°C, 0.008% Na ₂ S ₂ O ₃ ¹	7 days until extraction; 40 days after extraction
N-Nitrosodimethylamine ^{7, 10}	Glass, Teflon®-lined cap	Cool 4°C, 0.008% Na ₂ S ₂ O ₃ ¹ Store in dark	7 days until extraction; 40 days after extraction
N-Nitrosodi-n-propylamine ^{7, 10}	Glass, Teflon®-lined cap	Cool 4°C, 0.008% Na ₂ S ₂ O ₃ ¹ Store in dark	7 days until extraction; 40 days after extraction
N-Nitrosodiphenylamine ^{7, 10}	Glass, Teflon®-lined cap	Cool 4°C, 0.008% Na ₂ S ₂ O ₃ ¹ Store in dark	7 days until extraction; 40 days after extraction
2,2'-Oxybis(1-chloropropane)	Glass, Teflon®-lined cap	Cool 4°C, 0.008% Na ₂ S ₂ O ₃ ¹	7 days until extraction; 40 days after extraction

<u>Parameter</u>	Container ("P" means plastic, hard or soft; "G" means glass, hard or soft.)	<u>Preservation</u>	<u>Maximum Holding Time</u>
PCB-1016 ⁷	Glass, Teflon®-lined cap	Cool 4°C	7 days until extraction; 40 days after extraction
PCB-1221 ⁷	Glass, Teflon®-lined cap	Cool 4°C	7 days until extraction; 40 days after extraction
PCB-1232 ⁷	Glass, Teflon®-lined cap	Cool 4°C	7 days until extraction; 40 days after extraction
PCB-1242 ⁷	Glass, Teflon®-lined cap	Cool 4°C	7 days until extraction; 40 days after extraction
PCB-1248 ⁷	Glass, Teflon®-lined cap	Cool 4°C	7 days until extraction; 40 days after extraction
PCB-1254 ⁷	Glass, Teflon®-lined cap	Cool 4°C	7 days until extraction; 40 days after extraction
PCB-1260 ⁷	Glass, Teflon®-lined cap	Cool 4°C	7 days until extraction; 40 days after extraction
Pentachlorophenol	Glass, Teflon®-lined cap	Cool 4°C, 0.008% Na ₂ S ₂ O ₃ ¹	7 days until extraction; 40 days after extraction
Phenanthrene ⁷	Glass, Teflon®-lined cap	Cool 4°C, 0.008% Na ₂ S ₂ O ₃ ¹ Store in dark	7 days until extraction; 40 days after extraction
Phenol ⁷	Glass, Teflon®-lined cap	Cool 4°C, 0.008% Na ₂ S ₂ O ₃ ¹ Store in dark	7 days until extraction; 40 days after extraction
Pyrene ⁷	Glass, Teflon®-lined cap	Cool 4°C, 0.008% Na ₂ S ₂ O ₃ ¹ Store in dark	
2,3,7,8-Tetra- chlorodibenzo-p-dioxin ⁷	Glass, Teflon®-lined cap	Cool 4°C, 0.008% Na ₂ S ₂ O ₃ ¹	7 days until extraction; 40 days after extraction
1,1,2,2-Tetrachloroethane	Glass, Teflon®-lined septum	Cool 4°C, 0.008% Na ₂ S ₂ O ₃ ¹ HCl to pH 2 ⁵	14 days
Tetrachloroethene	Glass, Teflon®-lined septum	Cool 4°C, 0.008% Na ₂ S ₂ O ₃ ¹ HCl to pH 2 ⁵	14 days
Toluene	Glass, Teflon®-lined septum	Cool 4°C, 0.008% Na ₂ S ₂ O ₃ ¹ HCl to pH 2 ⁵	14 days
1,2,4-Trichlorobenzene ⁷	Glass, Teflon®-lined cap	Cool 4°C	7 days until extraction; 40 days after extraction
1,1,1-Trichloroethane	Glass, Teflon®-lined septum	Cool 4°C, 0.008% Na ₂ S ₂ O ₃ ¹ HCl to pH 2 ⁵	14 days
1,1,2-Trichloroethane	Glass, Teflon®-lined septum	Cool 4°C, 0.008% Na ₂ S ₂ O ₃ ¹ HCl to pH 2 ⁵	14 days
Trichloroethene	Glass, Teflon®-lined septum	Cool 4°C, 0.008% Na ₂ S ₂ O ₃ ¹ HCl to pH 2 ⁵	14 days
Trichlorofluoromethane	Glass, Teflon®-lined septum	Cool 4°C, 0.008% Na ₂ S ₂ O ₃ ¹ HCl to pH 2 ⁵	14 days
2,4,6-Trichlorophenol ⁷	Glass, Teflon®-lined cap	Cool 4°C, 0.008% Na ₂ S ₂ O ₃ ¹	7 days until extraction; 40 days after extraction
Vinyl chloride	Glass, Teflon®-lined septum	Cool 4°C, 0.008% Na ₂ S ₂ O ₃ ¹ HCl to pH 2	14 days ⁵
Pesticides Tests ⁷			
Aldrin	Glass, Teflon®-lined cap	Cool 4°C, pH 5-9 ¹⁰	7 days until extraction; 40 days after extraction
Ametryn	Glass, Teflon®-lined cap	Cool 4°C, pH 5-9 ¹⁰	7 days until extraction; 40 days after extraction
Aminocarb	Glass, Teflon®-	Cool 4°C,	7 days until extraction;

Parameter	Container ("P" means plastic, hard or soft; "G" means glass, hard or soft.)	Preservation	Maximum Holding Time
Atraton	lined cap Glass, Teflon®- lined cap	pH 5-9 ¹⁰ Cool 4°C, pH 5-9 ¹⁰	40 days after extraction 7 days until extraction; 40 days after extraction
Atrazine	Glass, Teflon®- lined cap	Cool 4°C, pH 5-9 ¹⁰	7 days until extraction; 40 days after extraction
Azinphos methyl	Glass, Teflon®- lined cap	Cool 4°C, pH 5-9 ¹⁰	7 days until extraction; 40 days after extraction
Barban	Glass, Teflon®- lined cap	Cool 4°C, pH 5-9 ¹⁰	7 days until extraction; 40 days after extraction
alpha-BHC	Glass, Teflon®- lined cap	Cool 4°C, pH 5-9 ¹⁰	7 days until extraction; 40 days after extraction
beta-BHC	Glass, Teflon®- lined cap	Cool 4°C, pH 5-9 ¹⁰	7 days until extraction; 40 days after extraction
delta-BHC	Glass, Teflon®- lined cap	Cool 4°C, pH 5-9 ¹⁰	7 days until extraction; 40 days after extraction
gamma-BHC (Lindane)	Glass, Teflon®- lined cap	Cool 4°C, pH 5-9 ¹⁰	7 days until extraction; 40 days after extraction
Captan	Glass, Teflon®- lined cap	Cool 4°C, pH 5-9 ¹⁰	7 days until extraction; 40 days after extraction
Carbaryl	Glass, Teflon®- lined cap	Cool 4°C, pH 5-9 ¹⁰	7 days until extraction; 40 days after extraction
Carbophenothion	Glass, Teflon®- lined cap	Cool 4°C, pH 5-9 ¹⁰	7 days until extraction; 40 days after extraction
Chlordane	Glass, Teflon®- lined cap	Cool 4°C, pH 5-9 ¹⁰	7 days until extraction; 40 days after extraction
Chloroprotham	Glass, Teflon®- lined cap	Cool 4°C, pH 5-9 ¹⁰	7 days until extraction; 40 days after extraction
2,4-D	Glass, Teflon®- lined cap	Cool 4°C, pH 5-9 ¹⁰	7 days until extraction; 40 days after extraction
4,4'-DDD	Glass, Teflon®- lined cap	Cool 4°C, pH 5-9 ¹⁰	7 days until extraction; 40 days after extraction
4,4'-DDE	Glass, Teflon®- lined cap	Cool 4°C, pH 5-9 ¹⁰	7 days until extraction; 40 days after extraction
4,4'-DDT	Glass, Teflon®- lined cap	Cool 4°C, pH 5-9 ¹⁰	7 days until extraction; 40 days after extraction
Demeton-O	Glass, Teflon®- lined cap	Cool 4°C, pH 5-9 ¹⁰	7 days until extraction; 40 days after extraction
Dementon-S	Glass, Teflon®- lined cap	Cool 4°C, pH 5-9 ¹⁰	7 days until extraction; 40 days after extraction
Diazinon	Glass, Teflon®- lined cap	Cool 4°C, pH 5-9 ¹⁰	7 days until extraction; 40 days after extraction
Dicamba	Glass, Teflon®- lined cap	Cool 4°C, pH 5-9 ¹⁰	7 days until extraction; 40 days after extraction
Dichlofenthion	Glass, Teflon®- lined cap	Cool 4°C, pH 5-9 ¹⁰	7 days until extraction; 40 days after extraction
Dichloran	Glass, Teflon®- lined cap	Cool 4°C, pH 5-9 ¹⁰	7 days until extraction; 40 days after extraction
Dicofol	Glass, Teflon®- lined cap	Cool 4°C, pH 5-9 ¹⁰	7 days until extraction; 40 days after extraction
Dieldrin	Glass, Teflon®- lined cap	Cool 4°C, pH 5-9 ¹⁰	7 days until extraction; 40 days after extraction
Dioxathion	Glass, Teflon®- lined cap	Cool 4°C, pH 5-9 ¹⁰	7 days until extraction; 40 days after extraction
Disulfoton	Glass, Teflon®- lined cap	Cool 4°C, pH 5-9 ¹⁰	7 days until extraction; 40 days after extraction
Diuron	Glass, Teflon®- lined cap	Cool 4°C, pH 5-9 ¹⁰	7 days until extraction; 40 days after extraction
Endosulfan I	Glass, Teflon®- lined cap	Cool 4°C, pH 5-9 ¹⁰	7 days until extraction; 40 days after extraction
Endosulfan II	Glass, Teflon®- lined cap	Cool 4°C, pH 5-9 ¹⁰	7 days until extraction; 40 days after extraction

<u>Parameter</u>	Container ("P" means plastic, hard or soft; "G" means glass, hard or soft.)	<u>Preservation</u>	<u>Maximum Holding Time</u>
Endosulfan Sulfate	Glass, Teflon®-lined cap	Cool 4°C, pH 5-9 ¹⁰	7 days until extraction; 40 days after extraction
Endrin	Glass, Teflon®-lined cap	Cool 4°C, pH 5-9 ¹⁰	7 days until extraction; 40 days after extraction
Endrin aldehyde	Glass, Teflon®-lined cap	Cool 4°C, pH 5-9 ¹⁰	7 days until extraction; 40 days after extraction
Ethion	Glass, Teflon®-lined cap	Cool 4°C, pH 5-9 ¹⁰	7 days until extraction; 40 days after extraction
Fenuron	Glass, Teflon®-lined cap	Cool 4°C, pH 5-9 ¹⁰	7 days until extraction; 40 days after extraction
Fenuron-TCA	Glass, Teflon®-lined cap	Cool 4°C, pH 5-9 ¹⁰	7 days until extraction; 40 days after extraction
Heptachlor	Glass, Teflon®-lined cap	Cool 4°C, pH 5-9 ¹⁰	7 days until extraction; 40 days after extraction
Heptachlor epoxide	Glass, Teflon®-lined cap	Cool 4°C, pH 5-9 ¹⁰	7 days until extraction; 40 days after extraction
Isodrin	Glass, Teflon®-lined cap	Cool 4°C, pH 5-9 ¹⁰	7 days until extraction; 40 days after extraction
Linuron	Glass, Teflon®-lined cap	Cool 4°C, pH 5-9 ¹⁰	7 days until extraction; 40 days after extraction
Malathion	Glass, Teflon®-lined cap	Cool 4°C, pH 5-9 ¹⁰	7 days until extraction; 40 days after extraction
Methiocarb	Glass, Teflon®-lined cap	Cool 4°C, pH 5-9 ¹⁰	7 days until extraction; 40 days after extraction
Methoxychlor	Glass, Teflon®-lined cap	Cool 4°C, pH 5-9 ¹⁰	7 days until extraction; 40 days after extraction
Mexacarbate	Glass, Teflon®-lined cap	Cool 4°C, pH 5-9 ¹⁰	7 days until extraction; 40 days after extraction
Mirex	Glass, Teflon®-lined cap	Cool 4°C, pH 5-9 ¹⁰	7 days until extraction; 40 days after extraction
Monuron	Glass, Teflon®-lined cap	Cool 4°C, pH 5-9 ¹⁰	7 days until extraction; 40 days after extraction
Monuron-TCA	Glass, Teflon®-lined cap	Cool 4°C, pH 5-9 ¹⁰	7 days until extraction; 40 days after extraction
Nuburon	Glass, Teflon®-lined cap	Cool 4°C, pH 5-9 ¹⁰	7 days until extraction; 40 days after extraction
Parathion methyl	Glass, Teflon®-lined cap	Cool 4°C, pH 5-9 ¹⁰	7 days until extraction; 40 days after extraction
Parathion ethyl	Glass, Teflon®-lined cap	Cool 4°C, pH 5-9 ¹⁰	7 days until extraction; 40 days after extraction
PCNB	Glass, Teflon®-lined cap	Cool 4°C, pH 5-9 ¹⁰	7 days until extraction; 40 days after extraction
Perthane	Glass, Teflon®-lined cap	Cool 4°C, pH 5-9 ¹⁰	7 days until extraction; 40 days after extraction
Prometron	Glass, Teflon®-lined cap	Cool 4°C, pH 5-9 ¹⁰	7 days until extraction; 40 days after extraction
Prometryn	Glass, Teflon®-lined cap	Cool 4°C, pH 5-9 ¹⁰	7 days until extraction; 40 days after extraction
Propazine	Glass, Teflon®-lined cap	Cool 4°C, pH 5-9 ¹⁰	7 days until extraction; 40 days after extraction
Propham	Glass, Teflon®-lined cap	Cool 4°C, pH 5-9 ¹⁰	7 days until extraction; 40 days after extraction
Propoxur	Glass, Teflon®-lined cap	Cool 4°C, pH 5-9 ¹⁰	7 days until extraction; 40 days after extraction
Sebumeton	Glass, Teflon®-lined cap	Cool 4°C, pH 5-9 ¹⁰	7 days until extraction; 40 days after extraction
Siduron	Glass, Teflon®-lined cap	Cool 4°C, pH 5-9 ¹⁰	7 days until extraction; 40 days after extraction
Simazine	Glass, Teflon®-	Cool 4°C,	7 days until extraction;

Parameter	Container ("P" means plastic, hard or soft; "G" means glass, hard or soft.)	Preservation	Maximum Holding Time
Strobane	lined cap Glass, Teflon®- lined cap	pH 5-9 ¹⁰ Cool 4°C, pH 5-9 ¹⁰	40 days after extraction 7 days until extraction; 40 days after extraction
Swep	Glass, Teflon®- lined cap	Cool 4°C, pH 5-9 ¹⁰	7 days until extraction; 40 days after extraction
2,4,5-T	Glass, Teflon®- lined cap	Cool 4°C, pH 5-9 ¹⁰	7 days until extraction; 40 days after extraction
2,4,5-TP (Silvex)	Glass, Teflon®- lined cap	Cool 4°C, pH 5-9 ¹⁰	7 days until extraction; 40 days after extraction
Terbutylazine	Glass, Teflon®- lined cap	Cool 4°C, pH 5-9 ¹⁰	7 days until extraction; 40 days after extraction
Toxaphene	Glass, Teflon®- lined cap	Cool 4°C, pH 5-9 ¹⁰	7 days until extraction; 40 days after extraction
Trifluralin	Glass, Teflon®- lined cap	Cool 4°C, pH 5-9 ¹⁰	7 days until extraction; 40 days after extraction

References for Table 9.2 Wastewater Samples and Solid/Hazardous Waste Samples (Aqueous Matrices)

¹ Use only in the presence of residual chlorine.

² Optionally, all samples may be tested with lead acetate paper before pH adjustment in order to determine if sulfide is present. If sulfide is present, it can be removed by the addition of cadmium nitrate powder until a negative spot test is obtained. The sample is filtered and then the NaOH is added to pH 12.

³ Filter samples immediately on-site before adding preservatives for dissolved metals.

⁴ Applies to samples to be analyzed by GC, LC, or GC/MS for specific compounds.

⁵ Sample receiving no pH adjustment shall be analyzed within seven days of sampling.

⁶ The pH adjustment is not required if acrolein will not be measured. Samples for acrolein receiving no pH adjustment shall be analyzed within three days of sampling.

⁷ When the extractable analytes of concern fall within a single chemical Category, the specified preservative and maximum holding times shall be observed for optimum safe guard of sample integrity. When the analyses of concern fall within two or more chemical Categories, the sample may be preserved by cooling to four degrees Celsius, reducing residual chlorine with 0.008 percent Na₂S₂O₃, storing in the dark and (for pesticides only) adjusting the pH to 6 to 9; samples preserved in this manner may be held for seven days before extraction and 40 days after extraction. Exceptions to this optional preservation and holding time procedure are noted in reference 1 (regarding the requirement for thiosulfate reduction of residual chlorine), and references 8 and 9 (regarding the analysis of benzidine).

⁸ Extracts may be stored up to seven days before analysis if storage is conducted under an inert (oxidant-free) atmosphere.

⁹ For the analysis of diphenylnitrosamine, add 0.008 percent Na₂S₂O₃ and adjust pH to 7 to 10 with NaOH within 24 hours of sampling.

¹⁰ The pH adjustment may be performed upon receipt at the environmental laboratory and may be omitted if the samples are extracted within 72 hours of collection. For the analysis of aldrin, add 0.008 percent Na₂S₂O₃.

(d) Drinking water samples that are to be subject to radiochemical measurements shall be handled and preserved in accordance with the requirements of Table 9.3 and the requirements of (d)1 below. Table 9.3 includes requirements from the USEPA's Manual for the Certification of Laboratories Analyzing Drinking Water, USEPA-814B-92-002. If there is any conflict between Table 9.3 and the USEPA publication (including any amendments or supplements) on which any part of Table 9.3 is based, the USEPA rule or publication shall control. The laboratory shall make radiochemical measurements using the instrumentation required under Table 9.3. In the list of required instrumentation in Table 9.3, "A" means a low background proportional system; "B" means an alpha scintillation system; "C" means a gamma spectrometer (NaI(Tl) or Ge (Li)); "D" means a scintillation cell (radon) system; "E" means a liquid scintillation system; and "F" means a fluorometer. The Department recommends a maximum hold-

ing time of six months for drinking water samples that are to be subject to radiochemical measurements for any parameter other than radon-222; for radon-222, the Department recommends a maximum holding time of four days.

1. Except as provided in (d)1i or ii below, the sample shall be acidified at the time of collection, in accordance with the requirements listed under "Preservation" in Table 9.3. A minimum of 16 hours shall elapse between acidification and analysis.

i. If suspended solids activity is to be measured, then a second unpreserved sample shall be taken for this measurement; and

ii. If the sample is shipped in its original container to a certified environmental laboratory or storage area, acidification of the sample (in its original container) may be delayed for a period not to exceed five days.

Table 9.3
Required Containers, Preservation Techniques, and Major Instrumentation for Radiochemical
Measurements in Drinking Water Samples

<u>Parameter</u>	<u>Preservation</u>	<u>Container</u> (“P” means plastic, hard or soft; “G” means glass, hard or soft.)	<u>Instrumentation</u>
Gross alpha	Conc HCl or HNO ₃ to pH 2 ¹	P or G	A or B
Gross beta	Conc HCl or HNO ₃ to pH 2 ¹	P or G	A
Strontium-89	Conc HCl or HNO ₃ to pH 2	P or G	A
Strontium-90	Conc HCl or HNO ₃ to pH 2	P or G	A
Radium-226	Conc HCl or HNO ₃ to pH 2	P or G	A, B or D
Radium-228	Conc HCl or HNO ₃ to pH 2	P or G	A
Cesium-134	Conc HCl or HNO ₃ to pH 2	P or G	A or C
Iodine-131	None	P or G	A
Tritium	None	G	E
Uranium	Conc HCl or HNO ₃ to pH 2	P or G	F
Photonemitters (including Cobalt-60, Ruthenium-106, and Zinc-65)	Conc HCl or HNO ₃ to pH 2	P or G	C
Radon-222	Cool 4°C	G	E

Reference for Table 9.3 (Drinking Water Samples)

¹ If HCl is used to acidify samples that are to be analyzed for gross alpha or gross beta activities the acid salts shall be converted to nitrate salts before transfer of the samples to planchets.

(e) Wastewater samples that are to be subject to radiochemical measurements shall be handled and preserved in accordance with the requirements of Table 9.4 and the requirements of (e)1 below. Table 9.4 incorporates requirements from 40 CFR 136.3. If there is any conflict between Table 9.4 and 40 CFR 136.3 (including any amendments or supplements), 40 CFR 136.3 shall control.

1. Except as provided in (e)1i or ii below, the sample shall be acidified at the time of collection, in accordance with the requirements listed under “Preservation” in Table 9.3. A minimum of 16 hours shall elapse between acidification and analysis.

i. If suspended solids activity is to be measured, a second unpreserved sample must be taken for this measurement; and

ii. If the sample is shipped in its original container to a certified environmental laboratory or storage area, acidification of the sample (in its original container) may be delayed for a period not to exceed five days.

Table 9.4
Required Containers, Preservation Techniques, and Holding Times
for Radiochemical Measurements in Wastewater Samples

<u>Parameter</u>	<u>Preservation</u>	<u>Container</u> (“P” means plastic, hard or soft; “G” means glass, hard or soft.)	<u>Maximum Holding Time</u>
Radiochemical Tests			
Alpha-Total	HNO ₃ to pH < 2	P, G	6 months
Alpha-Counting error	HNO ₃ to pH < 2	P, G	6 months
Beta-Total	HNO ₃ to pH < 2	P, G	6 months
Beta-Counting	HNO ₃ to pH < 2	P, G	6 months

<u>Parameter</u>	<u>Preservation</u>	<u>Container</u> (“P” means plastic, hard or soft; “G” means glass, hard or soft.)	<u>Maximum Holding Time</u>
error			
Radium-Total	HNO ₃ to pH < 2	P, G	6 months
Radium-226	HNO ₃ to pH < 2	P, G	6 months
Radon-222	Cool 4°C	P, G	4 days (recommended)

(f) Solid/hazardous waste samples (non-aqueous) shall be handled and preserved in accordance with the requirements of Table 9.5. Table 9.5 incorporates requirements from SW-846. If there is any conflict between Table 9.5 and SW-846 (including any amendments or supplements), SW-846 shall control.

Table 9.5

Required Containers, Preservation Techniques, and Holding Times for Solid/Hazardous Waste Samples
(Soils, Liquids, Sediments, and Sludges)

<u>Parameter</u>	<u>Container</u>	<u>Preservation</u>	<u>Maximum Holding Time</u>
Volatile Organics for soils/sediments, and sludges	Glass, Teflon®-lined cap	Cool 4°C	14 days
Volatile organics for concentrated waste samples	Glass, Teflon®-lined cap	None	14 days
Volatile organics in liquid samples	Glass, Teflon®-lined cap	Cool 4°C, if residual Cl ₂ add Na ₂ S ₂ O ₃ and HCl to pH < 2	14 days
Acrolein and Acrylonitrile in liquid samples	Glass, Teflon®-lined cap	Cool 4°C Adjust to pH 4-5	14 days
Semivolatile organics/organochlorine pesticides/PCBs and herbicides for soils/sediments, and sludges	Glass, Teflon®-lined cap	Cool 4°C	14 days until extraction; 40 days after extraction
Semivolatile organics/organochlorine pesticides/PCBs and herbicides for concentrated waste samples	Glass, Teflon®-lined cap	Cool 4°C	14 days until extraction; 40 days after extraction
Metals except Cr VI and Hg (total) for liquid samples	P, G	Cool 4°C, HNO ₃ to pH < 2	6 months
Metals except Cr VI and Hg (dissolved) for liquid samples	P, G	Cool 4°C, Filter onsite	6 months
Metals except Cr VI and Hg (suspended) for liquid samples	P, G	HNO ₃ to pH < 2 Cool 4°C Filter onsite	6 months
Metals except Cr VI and Hg for solid samples	P, G	Cool 4°C	6 months
Chromium VI for solid samples	P, G	Cool 4°C	24 hours
Chromium VI for liquid samples	P, G	Cool 4°C	24 hours
Mercury (total) for liquid samples	P, G	HNO ₃ to pH < 2	28 days
Mercury (dissolved) for liquid samples	P, G	Filter onsite HNO ₃ to pH < 2	28 days
Mercury (total) for solid samples	P, G	Cool 4°C	28 days

(g) CERCLA-CLP aqueous and non-aqueous samples shall be handled and preserved in accordance with the requirements of Table 9.6. Table 9.6 incorporates requirements from the USEPA’s “Statement of Work for Organics Analysis,” USEPA Contract Laboratory Program, Revision OLM03.1, August 1994; and “Statement of Work for Inorganic Analysis,” USEPA Contract Laboratory Program, Document No. ILM04 (undated). If there is any conflict

between Table 9.6 and one of these USEPA publications (including any amendments or supplements), the USEPA publication shall control. The maximum holding times specified in Table 9.6 begin at the validated time of sample receipt (VTSR) at the laboratory. The VTSR is the time shown on the chain-of-custody form as the time at which the laboratory received the sample.

Table 9.6

Required Containers, Preservation Techniques, and Holding Times for CERCLA-CLP Aqueous and Non-Aqueous

Parameter	Sample Container	Preservation	Maximum Holding Time
Volatile Organics (Aqueous Sample)	Glass, white polypropylene or black phenolic plastic screw cap, Teflon®-lined septum	Cool, 4°C, dark 0.08% Na ₂ S ₂ O ₃ if residual Cl ₂	10 days
Volatile Organics (Non-Aqueous Sample)	Glass, polypropylene cap, white Teflon® liner	Cool, 4°C, dark	10 days
Base Neutral/Acid Extractable (Semivolatile) Organics	Amber Glass, white polypropylene or black phenolic, baked polyethylene cap	Cool, 4°C, dark	Extraction-Aqueous continuous liquid-liquid extraction must be started within 5 days Non-Aqueous-10 days Analysis-40 days from validated time of sample receipt (at the laboratory)
Pesticide/PCBs	Amber Glass, white polypropylene or black phenolic baked polyethylene cap	Cool, 4°C, dark	Extraction-Aqueous continuous liquid-liquid extraction must be started within 5 days Non-Aqueous-10 days Analysis-40 days from validated time of sample receipt (at the laboratory)
High Level Volatile Organic Waste Samples (Aqueous)	Glass, black phenolic plastic or white polyethylene screw cap, Teflon®-lined septum	Cool, 4°C, dark	Analysis completed within 40 days of validated time of sample receipt (at the laboratory)
High Level Volatile Organic Waste Samples (Non-Aqueous)	Glass, black phenolic plastic or polyethylene cap, white Teflon® liner	Cool, 4°C, dark	Analysis completed within 40 days of validated time of sample receipt (at the laboratory)
High Concentration Extractable Organic Waste Samples	Glass, white polypropylene or black phenolic, baked polyethylene cap	Cool, 4°C, dark	Analysis completed within 40 days of validated time of sample receipt (at the laboratory)
High Concentration Aroclors and Toxaphene Samples	Glass, white polypropylene or black phenolic, baked polyethylene cap	Cool, 4°C, dark	Analysis completed within 40 days of validated time of sample receipt (at the laboratory)
Polychlorinated Dibenzo-p-Dioxins (PCDDs) and Dibenzofurans (PCDFs)	Glass, polypropylene cap, white Teflon® liner	Cool, 4°C, dark	None
Low Level Metals Aqueous except Hg	Plastic bottle, plastic cap, plastic liner	HNO ₃ to pH<2	180 days
Hg (Aqueous)	Plastic bottle, plastic cap, plastic liner	HNO ₃ to pH<2	28 days
Cyanide, total amenable to chlorination	Plastic bottle, plastic cap, plastic liner	Aqueous—0.6g ascorbic acid if residual Cl ₂ NaOH to pH>12, cool, 4°C, CaCO ₃ in presence of sulfide	14 days
Total Nitrogen	Plastic bottle, plastic cap, plastic liner	H ₂ SO ₄ to pH<2	28 days
Fluoride	Plastic bottle, plastic cap, plastic liner	Cool, 4°C until analysis	28 days
Metals except Hg (Aqueous)	Plastic bottle, plastic cap, plastic liner	HNO ₃ to pH<2	180 days
Metals except Hg (Non-Aqueous)	Flint glass bottle, black phenolic cap, polyethylene liner	Cool, 4°C	180 days
Hg (Aqueous)	Plastic bottle, plastic cap, plastic liner	HNO ₃ to pH<2	28 days
Hg (Non-Aqueous)	Flint glass bottle, black phenolic cap, polyethylene liner	HNO ₃ to pH<2	28 days
Cyanide (Aqueous)	Plastic bottle, plastic cap, plastic liner	0.6g ascorbic acid if residual Cl ₂ NaOH to pH>12, cool, 4°C until analyzed, CaCO ₃ in presence of sulfide	14 days

<u>Parameter</u>	<u>Sample Container</u>	<u>Preservation</u>	<u>Maximum Holding Time</u>
Cyanide (Non-Aqueous)	Plastic bottle, plastic cap, plastic liner	Cool, 4°C	14 days
High Level Metals except Hg (Aqueous)	Flint glass, white polypropylene or black phenolic, baked polyethylene cap	HNO ₃ to pH<2	180 days
High Level Metals except Hg (Non-Aqueous)	Flint glass, white polypropylene or black phenolic, baked polyethylene cap	Cool, 4°C	180 days
High Level Hg (Aqueous)	Flint glass, white polypropylene or black phenolic, baked polyethylene cap	HNO ₃ to pH<2	28 days
High Level Hg (Non-Aqueous)	Flint glass, white polypropylene or black phenolic, baked polyethylene cap	Cool, 4°C	28 days
Low Level Volatile Organics	Glass, black phenolic or white polypropylene screw cap, Teflon®-lined septum	Cool, 4°C, dark, 0.008% Na ₂ S ₂ O ₃	7 days
Low Level Semivolatile Organics	White polypropylene or black phenolic, baked polyethylene cap	Cool, 4°C, dark	Extraction—continuous extraction must be started within 5 days Analysis—40 days from start of extraction
Low Level Pesticides/PCBs Organics	Amber glass, white polypropylene or black phenolic, baked polyethylene cap	Cool, 4°C, dark	Extraction—continuous extraction must be started within 5 days Analysis—40 days from start of extraction

Amended by R.1997 d.192, effective May 19, 1997.

See: 28 N.J.R. 4149(a), 29 N.J.R. 2275(a).

In (c), in Table 9.2, in parameter Kjeldahl & Organic Nitrogen, added glass container as required container.

7:18-9.5 Requirements for acute toxicity testing samples

(a) Dilution water samples for acute toxicity testing shall be collected, handled and preserved in accordance with the following requirements:

1. Dilution water is acceptable for use in a toxicity test only if healthy test organisms survive in it through acclimation pursuant to N.J.A.C. 7:18-7.4(e)3ii, without showing any signs of stress, including but not limited to, abnormal behavior, discoloration, infection or disease;

2. Dilution water samples shall either be representative of the receiving water system that the effluent is discharged into, or, as designated by the Department in the NJPDES permit, be an alternate or reference water. Dilution water samples shall be collected in the following manner:

i. In non-tidal waters, dilution water samples shall be collected from a location outside of the influence, but upstream of, the effluent, except when the effluent is discharged into the headwaters of the water body. Under those conditions the dilution water sample shall be obtained in accordance with the procedures specified in (a)4 below;

ii. In estuarine waters, dilution water samples shall be collected from a location outside of the influence of the effluent, except when the effluent is discharged into the headwaters of the water body. Under those conditions the dilution water sample shall be obtained in accordance with the procedures specified in (a)4 below. Samples shall also be collected during the outgoing tide up to and during low slack tide;

iii. In marine waters (that is, tidal saltwaters), dilution water samples shall be collected from a location outside of the influence of the effluent being tested;

iv. The sampling location shall be such that the salinity of the sample shall be within the salinity range for the receiving water immediately outside of the effluent mixing zone;

v. When samples are collected from streams or rivers, an integrated sample shall be collected. This is a sample that is collected from bottom to the top of the water column so that the sample collected is proportional to the flow. If only a grab sample can be taken it should be collected at mid-depth in midstream;

vi. When samples are collected from reservoirs or lakes, the effects of seasonal stratification, runoff, and previous rain fall upon the chemical-physical characteristics of the water shall be considered; and

vii. If the receiving water has a natural pH below 5.0 units, then the dilution water samples shall be adjusted to pH of 5.0 prior to their use in test organism acclimation and/or toxicity testing.

3. If the receiving water is influenced by other point sources of pollution so as to disqualify its use as dilution water in accordance with the NJPDES permit, then the dilution water sample(s) shall be either obtained from a location just above the other point sources in the case of streams, or outside the zone of influence of other point sources in the case of other water bodies;

4. If acceptable dilution water cannot be obtained from the receiving water at any location because an effluent is discharged into the receiving water headwaters, then some other unpolluted water, meeting the following requirements, shall be used as an alternate in the following order of preference:

i. Another surface water or groundwater having a natural quality similar to that of the receiving water prior to its pollution may be used; or

ii. Reconstituted or artificial freshwater or saltwater having a natural quality similar to that of the receiving water prior to its pollution may be used; and

iii. An alternate dilution water shall have a total hardness, alkalinity, salinity, and specific conductance within 25 percent and a pH within 0.4 units of the receiving water prior to its pollution, but not less than a pH of 5.0 units;

5. The preparation of reconstituted freshwater or saltwater, as an alternate dilution water, shall comply with the following:

i. Preparation of reconstituted freshwater shall be by the addition of reagent grade chemicals to laboratory pure water as specified in SM16 p. 699-701, or EPA Acute Methods #027F-1993; and

ii. Preparation of a substitute or reconstituted saltwater dilution water shall either be through the use of a hypersaline brine as specified in N.J.A.C. 7:18-7.4(b)8ii, by using commercial sea salts, or by the addition of reagent grade chemicals to laboratory pure water as specified in SM16, p. 699-701 or EPA Acute Methods #027F-1993.

6. Alteration of dilution water samples shall be limited to the following:

i. Filtration through screening made of a non-toxic material as specified in N.J.A.C. 7:18-7.3(a)1. This screening shall have a mesh of two mm or larger for fishes or 0.45 microns or larger for zooplankton and macrocrustaceans; and

ii. Adjustment of the salinity of dilution water samples shall only be by either the addition of laboratory pure water to lower the salinity or by the addition of either a hypersaline brine or artificial sea salts to raise the salinity.

(1) Only a natural water source, meeting the requirements for laboratory grade salt waters, shall be used to produce a hypersaline brine; and

(2) A hypersaline brine shall not exceed a salinity of 100 ppt;

7. Sample collection and transport containers shall meet the requirements listed in N.J.A.C. 7:18-7.3(a)13. Prior to sample collection all containers shall be rinsed with the dilution water and then filled so that there should be little or no air in the container neck or cap;

8. Dilution water sample storage shall be in covered containers constructed of non-toxic materials as specified in N.J.A.C. 7:18-7.3(a)13; and

9. Except for samples of laboratory grade water being used as an alternate or reference dilution water as specified in (a)4 above, samples shall not be stored for more than 150 hours and shall be collected as close as possible to the time of use.

(b) Effluent samples for acute toxicity testing shall be collected, handled, and preserved in accordance with the following requirements:

1. The effluent sampling location shall be the same as that specified in the NJPDES permit as the toxicity test analysis sampling point unless otherwise specified by the Department. The Department may specify an alternative sampling location when either of the following conditions occur:

i. When there is better access to the effluent at a point located between the final treatment and the discharge outfall. That point shall be the sampling point; or

ii. When the chlorinated effluent is dechlorinated prior to discharge, and the purpose of the test is to determine the toxicity levels of the dechlorinated effluent. The sampling point shall be located after dechlorination.

2. Samples shall be representative of the discharge, taking into account the plant operating conditions and the retention time of the effluent in the wastewater treatment plant;

3. When performing flow-through toxicity tests the following sampling procedures shall be adhered to in order to insure a representative effluent sample:

i. If the facility discharges continuously, the effluent shall be pumped directly and continuously from the discharge line to the dilutor system for the duration of the test; or