(b) 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).

(c) 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.

(d) 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.

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. 7:14 Appendix A, together with all amendments and supplements, are incorporated by reference into this chapter.

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
CN 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).

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.

"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.

"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, for Acute Toxicity Testing, 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, Acute 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, for acute toxicity testing, "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 for daphnid culturing and testing techniques used in N.J.A.C. 7:18–7, Acute Toxicity Testing.

"ASTM E 724–80" means, for acute toxicity testing, "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 subchapter 7, Acute Toxicity Testing.

"ASTM E 729–80" means, for acute toxicity testing, "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 subchapter 7, Acute 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–86–0l4.

"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, for acute toxicity testing, 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 bioassays.

"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, for acute toxicity testing, "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 subchapter 7, Acute 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 = Diluted sample volume/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. DSMs 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.

"EC_{50}" 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 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 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/600/287/082, 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 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.

"New Jersey Pollutant Discharge Elimination System rules" or "NJPDES rules" means the rules promulgated by the Department at N.J.A.C. 7:l4A, together with all amendments and supplements. The NJPDES rules govern the Department's system for issuing, modifying, suspending, revoking 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."

"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 performance 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 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.

"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 x (volume of effluent)/(volume of effluent + 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).

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.

(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.

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 0.45μm 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, mouthpiece 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;

Material	Time (Minutes)
Membrane filters and pads	10
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

iii. If glassware is sterilized in a hot air oven, the temperature shall be held at 170 degrees Celsius for a minimum of two hours.

2. The laboratory shall use only laboratory pure water that:

i. Has been tested by a certified environmental laboratory certified to perform the required chemical analysis for testing of the laboratory pure water; and

ii. Meets the requirements in Table 4.1 at N.J.A.C. 7:18–4.5(c)4.

3. The laboratory shall use only rinse water and dilution water that meets the following requirements:

i. Stock buffer solution shall be prepared in accordance with the DSAM or EPA Microbiological Methods, using laboratory pure water;

ii. Stock buffer shall be either autoclaved or filter-sterilized, and must be labeled, dated, and stored at one to five degrees Celsius;

iii. The stored buffer solution shall be free of turbidity; and

iv. Rinse and dilution water shall be prepared by adding 1.25 milliliters of stock buffer solution and five milliliters of magnesium chloride solution per liter of laboratory pure water, and the final pH shall be 7.2 ±0.1.

4. The laboratory shall use only media that is prepared and stored in accordance with the following requirements:

i. All media shall be prepared according to the procedures for media preparation set out in the DSAM. However, lactose broth shall not be used;

ii. Dehydrated media containers shall be kept tightly closed and stored in a cool, dry location, to prevent discoloration and caking. Laboratories shall not use discolored or caked dehydrated media;

iii. Dissolution of the media using laboratory pure water shall be completed before dispensing to culture tubes or bottles;

iv. The membrane filter broth and agar media shall be heated in a boiling water bath or they may be heated on a hot plate if constantly agitated until completely dissolved;

v. MF broths shall be stored and refrigerated no longer than 96 hours and poured MF agar plates shall be stored, refrigerated and used within two weeks;

vi. MPN media prepared in tubes with loose-fitting caps shall be used within one week, but if MPN media are refrigerated after sterilization, they shall be incubated overnight at 35 degrees Celsius to confirm usability, and tubes showing growth or gas bubbles shall be discarded;

vii. Media in screw cap containers may be held up to three months, provided that the media are stored in an enclosed area so that no light may enter and evaporation does not exceed 10 percent of the original volume; in addition, commercially prepared liquid and agar media supplies may be used; and

viii. Ampule media shall be stored at one to five degrees Celsius (34 to 41 degrees Fahrenheit), and storage time shall be limited to the manufacturer's expiration date.

7:18–4.5 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 chapter 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 Microbiological 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.

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 may not be used in lieu thereof.

(c) A laboratory performing microbiological analyses shall conduct the quality control checks specified in the applicable DSAMs, and the following additional checks:

1. When the laboratory finds no positive samples for a certified method within a calendar quarter, the laboratory shall run a positive control sample for that method;

2. For each sample filtration series, the laboratory shall conduct a start and finish MF sterile control test of

rinse water, media and supplies, using sterile rinse water as the sample. If the MF sterile control tests indicate contamination, then all data from the affected samples shall be rejected and the laboratory shall request immediate resampling of those waters involved in the laboratory error;

3. The laboratory shall complete the MPN test for drinking water samples on 10 percent of positive confirmed total coliform samples, except that gram staining need not be performed. However, if no positive tubes result from the tested drinking water samples, the laboratory shall complete the MPN test (and need not perform gram staining) quarterly on at least one water source for which results have been positive;

4. The laboratory shall cause its laboratory pure water to be tested, using approved methods, in accordance with (c)4i through v below.

i. The testing may be performed by the laboratory preparing the water, by another certified environmental laboratory, or by the manufacturer of the water if the laboratory purchases its laboratory pure water. If the laboratory purchases its laboratory pure water, it shall have each lot or batch of the water tested. Otherwise, the laboratory shall have its laboratory pure water tested at the frequency specified in Table 4.1 below;

ii. If the source water is chlorinated, the laboratory shall test the water for total residual chlorine using the DPD method. If the source water is not chlorinated, the laboratory need not test it for residual chlorine;

iii. The pour plate method (Method 9215B in SM18) shall be used to determine the heterotrophic plate count;

iv. In testing the bacteriological quality of the water, the laboratory shall use the methods described in SM18 or in EPA Microbiological Methods, p.200. The control water for testing bacteriological quality is double distilled water using a glass still; and

v. If the laboratory pure water does not meet the criteria set forth in Table 4.1 below, then the laboratory shall take action immediately to correct all failures to meet the criteria, and shall continue taking corrective action until a retest of the water shows that it meets the criteria.

Table 4.1
Requirements for Laboratory Pure Water

Parameter	Limits	Frequency
Conductivity	>0.5 megohms resistance or <2 micromhos/cm at 25°C	Monthly
Lead, Cadmium, Chromium, Copper, Nickel, Zinc	Not greater than 0.05 mg/L per parameter. Collectively, no greater than 0.1 mg/L	Annually
Total Chlorine, Residual	Nondetectable	Monthly
Heterotrophic Plate Count	<500/milliliter	Monthly
Bacteriological Water Quality	Ratio 0.8–3.0	Annually

5. Each certified environmental laboratory shall satisfactorily analyze one unknown PE sample per year, when available from the Department, for the parameters within the Categories for which the environmental laboratory has received certification;

6. Any certified environmental laboratory analyzing samples for a public water facility shall examine a minimum of one positive control sample per month in addition to analyzing the required number of distribution samples and records maintained;

7. The laboratory shall record the temperature of air or water-jacketed incubators and water baths at least twice daily, with at least four hours between readings;

8. The laboratory shall record the contents, date, time, and temperature for each sterilization cycle of the autoclave;

9. The laboratory shall maintain records of hot air ovens showing the contents, date, time and temperature of each sterilization cycle;

10. The laboratory shall use only membrane filters that have been recommended or approved by the manufacturer for use in the analysis of water;

11. When the laboratory first uses a detergent or washing product, or changes the brand or type of washing product it uses, the rinsing process shall demonstrate that the detergent or washing product provides glassware free of toxic material by the inhibitory residue test as set forth in SM18 or in EPA Microbiological Methods, p. 199;

12. The laboratory shall check each batch of rinse water for sterility. The laboratory shall add 50 milliliters of water to a 50 milliliter volume of a double-strength non-selective broth (for example, tryptic soy, trypticase soy or tryptone broth) and then incubating the preparation at 35 degrees ±0.5 degrees Celsius for 24 hours. At the end of the incubation period, the laboratory shall check the preparation for growth, and record the results. If bacterial growth is observed, the batch shall be discarded and a new batch prepared;

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 ±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;

7:18–6.7 Requirements for records and data reporting

(a) The laboratory shall retain records concerning radiochemical 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. 7:18–6.6(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).

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 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, specific place, and time of the sampling;

3. The name and signature of the person who collected the sample;

4. Identification of sample as a routine distribution sample, check sample, raw or process water sample, or other special purpose sample;

5. The date that the laboratory received the sample;

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

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

8. For radon/radon progeny-in-air samples taken by a certified radon measurement specialist or certified radon measurement technician, a chain-of-custody form indicating the sampling device/technique that was used and whether the authorized measurement protocols were followed;

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

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

(e) The laboratory may transfer all information described in (d) above to tabular summaries, except for:

1. Information regarding compliance check samples as detailed in 40 CFR 141.33(b); and

2. The chain-of-custody forms described in (d)8 above.

(f) Upon completion of the analysis, the laboratory shall supply the original or a true duplicate of the results of the tests or analyses to the client. The laboratory shall include the following information in reporting the results:

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

2. The date, time, and location of sample analysis;

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

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

5. The results of the analysis; and

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

(g) 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.

(h) 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.

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

SUBCHAPTER 7. ACUTE TOXICITY TESTING

7:18–7.1 Scope

This subchapter applies to certified environmental laboratories when performing acute toxicity testing on regulatory samples, and to other laboratories performing acute toxicity testing on PE samples to become certified.

7:18–7.2 Laboratory facilities and safety

(a) A laboratory performing acute toxicity tests shall meet the following minimum requirements:

1. The laboratory shall meet all applicable requirements of N.J.A.C. 7:18–3, including, without limitation, N.J.A.C. 7:18–3.2;

2. The laboratory shall allocate floor space and bench top space as follows:

i. For bioassay-toxicity testing, the laboratory shall allocate at least 50 square feet of floor space with at least 20 square feet of bench top space. For each additional toxicity test to be performed concurrently, the laboratory shall allocate at least 15 additional square feet of bench top space;

ii. For rearing-holding of invertebrate test organisms, the laboratory shall allocate at least 50 square feet of floor space with at least 10 square feet of bench top space. For rearing-holding of vertebrate test organisms, the laboratory shall allocate at least 75 square feet of floor space with at least 15 square feet of bench top space; and

iii. The laboratory may either combine the water chemistry area with the equipment cleaning area, or separate the areas. The laboratory shall allocate a total of 60 square feet of floor space for water chemistry and equipment cleaning, with at least 20 square feet of bench top space. If the water chemistry and the equipment cleaning areas are separated, then the equipment cleaning area shall be no less than 15 percent (in square feet) of the floor and bench top space allocated to the water chemistry area. The water chemistry area is used for preparation and standardization of reagents and media, and for working with hazardous or noxious materials such as acids and solvents. The laboratory should separate this area from the area used for test organism culturing-holding and from the area used for toxicity testing. The equipment cleaning area is used for the decontamination of equipment used for sampling and/or testing and shall be separate from the test organism culturing-holding area and from the toxicity test testing area;

3. For bioassay-toxicity testing areas, the laboratory shall have a temperature-controlled room or water bath capable of maintaining the temperature of test solutions within ±two degrees Celsius of the test temperature;

4. For test organism rearing-holding areas, the laboratory shall have:

i. A temperature-controlled room or chamber capable of maintaining the temperature of solutions within ±two degrees Celsius of the selected temperature;

ii. A supply of distilled or deionized water adequate for making up reagents and media. The water shall satisfy the requirements of N.J.A.C. 7:18–7.4(a) for laboratory pure water; and

iii. A supply of high quality fresh and/or saltwater adequate for use in the rearing/holding tanks or vessels. The water shall satisfy the requirements of N.J.A.C. 7:18–7.4(b) for laboratory grade water; and

5. For water chemistry and equipment cleaning areas, the laboratory shall have:

i. Access to a well-ventilated area or fume hood for the safe use of noxious chemicals; and

ii. A supply of laboratory pure water satisfying the requirements of N.J.A.C. 7:18–7.4(a).

7:18–7.3 Laboratory equipment, instruments and materials

(a) A laboratory performing toxicity tests shall have, on the premises and under the control of the laboratory supervisor, equipment and instruments that satisfy the requirements of (a)1 through 14 below and N.J.A.C. 7:18–3.3.

1. For materials used in the construction of toxicity testing systems, test organism culturing systems, and sample collection, handling, and transport systems:

i. The laboratory shall use only materials listed as "Approved" in Table 7.3 below for the type of test organism in question.

Table 7.3
Materials for constructing toxicity testing systems, test organism culturing systems, and sample collection, handling and transport systems

Material	Test Organisms: Vertebrate	Test Organisms: Invertebrate
Glass, borosilicate, tempered, or soda lime	Approved	Approved
Stainless steel, # 304 or 316	Approved	Approved
Medical grade or food contact silicone, sealant, tubing, and stoppers	Approved	Approved

Material	Test Organisms: Vertebrate	Test Organisms: Invertebrate
Perfluorocarbon plastics	Approved	Approved
Polyethylene, white or clear	Approved	Approved
Polypropylene	Approved	Approved
Polycarbonate	Approved	Approved
Polystyrene	Approved	Approved
Acrylic	Approved	Approved
Tygon ®, clear or black	Approved	Not Approved (except for Mysids)
Nylon	Approved	Approved
Fiberglass	Approved	Approved
Potable water or food contact grade polyvinyl chloride	Approved	Approved
Rubber, Neoprene and Gum Latex	Not Approved	Not Approved
Ceramic (Aluminum Oxide)	Approved	Approved

ii. The laboratory shall use glass, stainless steel, ceramic and perfluorocarbon plastics whenever possible for components that come in contact with wastewater samples;

iii. If the laboratory uses silicone, polyethylene, polypropylene, nylon, Tygon®, polycarbonate and polystyrene plastics for a component that comes in contact with wastewater samples, it shall either discard the component after a single use, or demonstrate that the component can be decontaminated, without significant degradation, by one or more cleaning procedures listed in N.J.A.C. 7:18–7.4(c). To demonstrate that the component can be decontaminated, the laboratory shall:

(1) Clean the component in accordance with the applicable procedures under N.J.A.C. 7:18–7.4(c) after using the component to conduct a compliance toxicity test;

(2) Remove the component, taking an adequate sample of each type of material being used;

(3) Segregate each type of material into a separate container, just large enough to completely immerse the materials in laboratory pure water. The laboratory shall have cleaned the container using the procedure under N.J.A.C. 7:18–7.4(c) appropriate to the test organism used;

(4) Soak the component in laboratory pure water for 24 hours;

(5) Decant a sufficient volume of water from each container (or groups of containers of like materials) to analyze for the organic compounds, metals and trace elements listed in N.J.A.C. 7:18–7.4(b)1;

(6) Perform an analysis for each type of material for which the laboratory seeks approval; and

(7) Forward the analytical results to the Department. The Department shall approve the use of the material only if the analytical results show that there is no significant degradation of the material, or cross-over of contamination.

iv. The use of polyvinylchloride, fiberglass, and acrylics shall only be for holding, acclimating, and rearing system components and for dilution water storage and delivery system components. Before use, the laboratory shall test every batch of these materials for toxicity to the pertinent test organisms. The laboratory shall retain the documentation of such tests;

v. The laboratory shall not use Tygon® for components used in an invertebrate testing, holding, acclimating or rearing system except for Mysids. If the laboratory uses bakelite components in an invertebrate testing, holding, acclimating or rearing system, and if that bakelite is heated to sterilization temperatures, the laboratory shall not allow any other system components to come in contact with either the bakelite or the fumes arising from the bakelite;

vi. The laboratory shall not use in toxicity testing any material that is not listed in Table 7.3, without first obtaining the Department's written approval. To obtain the Department's approval, the laboratory shall test the material's toxicity to the pertinent test organisms and submit documentation of the testing to the Department. The Department shall approve the material only if the documentation demonstrates that the material does not exhibit toxic or subtoxic effects (that is, decreased brood size in invertebrate test organisms) to the test organisms; and

vii. Except for materials labeled and sold as either "medical grade" or "food grade," the laboratory shall clean all new materials before using them. The laboratory shall follow the following cleaning procedure:

(1) Wash the materials with a hot solution of a detergent leaving no toxic residue and tap water that is prepared in accordance with the detergent manufacturer's instructions;

(2) Rinse the materials well with hot tap water to remove all traces of detergent;

(3) If the material is all-glass laboratory ware or perfluorocarbon plastic material, and has a capacity less than or equal to four liters, then soak glassware in 10 percent hydrochloric acid (HCl) for at least one hour to remove heavy metal contamination. If the material is all-glass laboratory ware or perfluorocar-

bon plastic material, and has a capacity greater than four liters, then rinse it at least twice with 10 percent HCl. After soaking or rinsing with acid, rinse twice or more with laboratory pure water to remove all traces of acid; and

(4) If the material is perfluorocarbon plastic, rinse it twice with full strength acetone, then rinse it at least twice with laboratory pure water and air or oven dry it.

2. For flow through toxicity tests, the laboratory shall use a dilutor system for the accurate measuring, mixing, and delivery of sample and dilution water to the exposure chambers. Detailed descriptions of dilutor systems allowable are found in Standard Methods, 16th edition, and in EPA Acute Methods #027F–1993. The laboratory shall use a dilutor system that:

i. Provides an adequate supply of dilution water to maintain 24 hours of continuous operation. The system shall obtain the supply from a dilution water reservoir, or by direct continuous pumping from the source of the water;

ii. Is capable of metering the flow of dilution water and sample into a mixing chamber for the determination of concentrations. The system shall use a constant head box or metering pumps to meter the flow of dilution water and sample;

iii. Uses mixing chambers to ensure complete mixing of dilution water and sample before dispensing solutions into the exposure chambers;

iv. Uses separate delivery tubes to transmit the dilution water and sample from the flow splitters, after the mixing chambers, to each of the replicate exposure chambers;

v. Provides a flow rate through the exposure chambers that results in at least five 90 percent water volume changes every 24 hours, and that is sufficient to maintain dissolved oxygen in the exposure chambers in accordance with N.J.A.C. 7:18–7.5(h);

vi. Provides a flow rate through the exposure chambers that does not vary by more than ±10 percent among all exposure chambers or ±five percent within any given exposure chamber throughout the duration of the test;

vii. Maintains the test concentration in each exposure chamber within ±five percent of the starting concentration for the duration of the test;

viii. Should be designed to maintain a constant temperature in the exposure chambers within ±two degrees Celsius of the specified test temperature;

ix. Is designed to curtail automatically the delivery of the sample to the mixing chambers if the supply of dilution water to the mixing chamber is interrupted;

x. Is designed to prevent the test organisms from entering the overflow outlets in the exposure chambers;

xi. Is capable of maintaining at least five separate effluent dilutions and a control containing dilution water with replicate exposure chambers; and

xii. Has had its exposure chamber flow rate, exposure chamber effluent concentration accuracy, and test solution temperatures checked and calibrated initially and at least once per day for the duration of the test, including the last day of the test. The laboratory shall keep records of these calibrations in accordance with N.J.A.C. 7:18–7.7(i), and make them available to the Department during an inspection of the laboratory.

3. The laboratory shall use holding, acclimating and culturing chambers that:

i. Are constructed of non-toxic materials that satisfy the requirements of (a)1 above;

ii. Include devices for temperature control, or are located in a temperature-controlled room;

iii. Are constructed for ease of cleaning and the prevention of waste material build-up; and

iv. If used for vertebrate species, are shielded from outside disturbances. The laboratory may shield the chamber either by isolating it in a low-traffic area, or by shielding it individually. If the materials used to shield a chamber individually will contact the culture media, the laboratory shall use materials that satisfy the requirements of (a)1 above.

4. The laboratory shall use test chambers that:

i. Can accommodate the testing of fish species in containers with a test solution at least five centimeters (cm) deep;

ii. If fabricated from non-seamless stainless steel, have welded seams rather than soldered seams;

iii. If fabricated from lead-free glass, are made in one piece or made with the use of clear silicone adhesive, of the type approved by the manufacturer for use in aquaria, to bond the seams. The laboratory shall expose as little of the silicone adhesive to the test solution as possible. Extra beads of adhesive shall be placed only on the outside of containers; and

iv. Are designed to keep the surface areas as small as possible in relation to their volume, in order to limit sorption to the vessel walls. Containers to be used with flow-through tests shall be designed to keep the liquid surface area/volume ratio as small as possible in order to reduce loss of volatile substances.

5. A laboratory shall have and use a balance that:

i. Satisfies the requirements of N.J.A.C. 7:18–3.3(a)2;

ii. Has a range of at least 0 to 40 grams;

iii. Is readable within 0.1 grams;

iv. Provides reproducibility of at least ±0.05 grams.

6. Laboratories performing acute toxicity testing shall have and use one or more pH meters that satisfy the requirements of N.J.A.C. 7:18–3.3(a)3.

7. Laboratories performing acute toxicity testing shall have and use one or more conductivity instruments that satisfy the requirements of N.J.A.C. 7:18–3.3(a)6.

8. Laboratories performing acute toxicity testing shall have and use one or more dissolved oxygen meters that satisfy the requirements of N.J.A.C. 7:18–5.2(a)17.

9. Laboratories performing tests with *Daphnia sp.,* and Cladoceran, shall have the following equipment:

i. A light meter capable of measuring in Lux or footcandles in the range of at least 0 to 200 footcandles;

ii. Medicine droppers or pipettes with 1.0 to 3.0 mm bores;

iii. Borosilicate glass beakers with covers, or test chambers made of another approved material under (a)1 above; and

iv. All testing equipment to be constructed with materials as approved for invertebrates in (a)1 above.

10. A laboratory shall have a refrigerator that is capable of storing the required sample volumes and that satisfies the requirements of N.J.A.C. 7:18–3.3(a)7.

11. Laboratories performing zooplankton or macrocrustacean toxicity tests shall have and use a low-power magnification device, for working with invertebrate species.

12. A laboratory shall use only glassware, plasticware and metal utensils that satisfy the requirements of N.J.A.C. 7:18–3.3(a)8. The laboratory shall use plasticware only if it is made of inert, nontoxic materials approved under (a)1 above. When manually establishing test solutions, the laboratory shall use Class "A" volumetric flasks or graduated cylinders, calibrated "to deliver."

13. Dilution water sample containers used by the laboratory for discrete samples shall meet the following requirements:

i. The laboratory shall use only wide-mouthed containers equipped either with stoppers, screw caps or an equivalent closure;

ii. The laboratory shall use only containers and cap liners constructed of materials approved under (a)1 above; and

iii. The laboratory shall clean each container after each use, in accordance with N.J.A.C. 7:18–7.4(c).

14. A laboratory performing discrete effluent sampling shall use containers meeting the following requirements:

i. The laboratory shall use either wide-mouthed glass containers, disposable unplasticized plastic containers, or disposable unplasticized plastic liners for containers that are leakproof and constructed of materials meeting the requirements of (a)1;

ii. The laboratory shall not reuse containers made of materials listed in (a)1ii above unless they have been cleaned in accordance with N.J.A.C. 7:18–7.4(c);

iii. The laboratory shall discard after one use any containers made of materials specified in (a)1iii above, and not cleaned and reused unless the laboratory has demonstrated pursuant to (a)1iii above that the container can be decontaminated without significant degradation;

iv. Container closures shall be leakproof and constructed of materials meeting the requirements of (a)1 above; and

v. The laboratory shall store containers in a manner that prevents contamination.

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

7:18–7.4 General laboratory procedures

(a) A laboratory performing acute toxicity tests shall have available and use glass-distilled or deionized water, referred to in this chapter as laboratory pure water, that satisfies the following requirements:

1. The laboratory pure water shall have conductivity of less than 1.0 micromho/cm at 25 degrees Celsius, and shall not contain any of the constituents listed in Table 7.4(a) in a concentration greater than or equal to the limit specified in Table 7.4(a).

Table 7.4(a)
Constituents in Laboratory Pure Water

Constituent	Limit
Arsenic, Chromium(VI) and Nickel	10.0 μg/L each
Total Organic Carbon (TOC)	2.0mg/L
Fluoride	100 μg/L
Un-ionized Ammonia	12.5 μg/L
Lead and Copper	5.0 μg/L each
Silver	2.0 μg/L
Mercury	0.30 μg/L
Total Residual Chlorine	0.5mg/L
Cadmium	1.0 μg/L
Aldrin	0.03 μg/L
Chlordane	0.5 μg/L
DDT and DDE pesticides	0.13 μg/L each
Dieldrin	0.05 μg/L
Endosulfan I & II	0.06 μg/L each
Endrin	0.10 μg/L

Constituent	Limit
Heptachlor	0.09 μg/L
Lindane	0.08 μg/L
PCBs (as PCB 1242)	0.07 μg/L
Toxaphene	1.00 μg/L
Standard (Heterotrophic) Plate Count	100 colony forming units (CFU)/100 mL
Bacteriological Water Suitability Test	0.8-3.0 Ratio
Total Solids	10 mg/L

2. The laboratory shall have the laboratory pure water analyzed at least monthly for conductivity or resistivity, and for total residual chlorine. The laboratory shall document the results.

3. The laboratory shall have the laboratory pure water analyzed at least semi-annually for standard plate count, and at least annually for TOC, total solids, fluoride, un-ionized ammonia, arsenic, hexavalent chromium, copper, lead, nickel, cadmium, mercury, silver, bacteriological water suitability test, all listed pesticides, and PCBs. The laboratory shall document the results.

(b) A laboratory performing acute toxicity tests shall have available and use a supply of water of constant quality for the holding, spawning, and rearing of aquatic organisms, referred to in this subchapter as laboratory grade water. The laboratory may reconstitute the laboratory grade water from laboratory pure water or obtain it from a natural source. The laboratory shall use only laboratory grade water that satisfies the following requirements:

1. The laboratory grade freshwater supplies shall be constant in quality and shall not contain any of the constituents listed in Table 7.4(b)1 in a concentration greater than the limit specified in Table 7.4(b)1.

Table 7.4(b)1
Constituents in Laboratory Grade Freshwater

Constituent	Limit
Salinity	3.5 parts per thousand (ppt)
Suspended solids	80 mg/L
TOC	10 mg/L
Un-ionized ammonia	12.5 μg/L
Total residual chlorine	0.5 μg/L
Aldrin	3.0 μg/L
Chlordane	0.5 μg/L
DDT & DDE	0.13 μg/L each
Dieldrin	0.05 μg/L
Endosulfan I & II	0.06 μg/L each
Endrin	0.10 μg/L
Heptachlor	0.09 μg/L
Lindane	0.08 μg/L
PCBs (as PCB 1242)	0.5 μg/L
Toxaphene	1.00 μg/L
Fluoride	100 μg/L
Antimony	146 μg/L
Arsenic	40.0 μg/L
Cadmium	e(0.7852 [In (Hardness)] – 3.49) μg/L
Hexavalent chromium	11 μg/L
Copper	e(0.8545 [In (Hardness)] – 1.465) μg/L
Lead	e(1.273 [In (Hardness)] – 1.460) μg/L
Mercury	0.30 μg/L
Nickel	e(0.84 [In (Hardness)]-1.1645) μg/L
Selenium (recoverable inorganic selenite)	35 μg/L
Silver	e(1.72 [In (Hardness)] – 6.52) μg/L
Zinc	e(0.8473 [In (Hardness)] + 0.7614) μg/L

2. The laboratory grade saltwater supplies shall be constant in quality, have a salinity greater than 3.5 ppt with a range favorable to the test organisms, and shall not contain any of the constituents listed in Table 7.4(b)2 in a concentration greater than the limit specified in Table 7.4(b)2.

Table 7.4(b)2
Constituents in Laboratory Grade Saltwater

Constituent	Limit
Suspended solids	80 mg/L
TOC	10 mg/L
Un-ionized ammonia	12.5 μg/L
Aldrin	1.3 μg/L
Chlordane	0.5 μg/L
DDT & DDE	0.13 μg/L each
Dieldrin	0.05 μg/L
Endosulfan I & II	0.05 μg/L each
Endrin	0.10 μg/L
Heptachlor	0.09 μg/L
Lindane	0.08 μg/L
PCBs (as PCB 1242)	0.5 μg/L
Toxaphene	1.0 μg/L
Fluoride	1400 μg/L
Antimony	146 μg/L
Arsenic	136 μg/L
Cadmium	2.0 μg/L
Hexavalent chromium	50 μg/L
Copper (dissolved)	2.9 μg/L
Lead	5.6 μg/L
Mercury	0.2 μg/L
Nickel	8.3 μg/L
Selenium (recoverable inorganic selenite)	54 μg/L
Silver	5.0 μg/L
Zinc	86 μg/L

3. The laboratory shall have the laboratory grade freshwater and saltwater analyzed at least monthly for pH, salinity, alkalinity, and un-ionized ammonia. Suspended solids should be analyzed monthly.

4. The laboratory shall have the laboratory grade freshwater analyzed at least monthly for total residual chlorine and total hardness.

5. The laboratory shall have the laboratory grade waters analyzed at least semi-annually for TOC, all listed pesticides, PCBs, fluoride, and all trace elements and metals specified in N.J.A.C. 7:18–7.4(b)1 for freshwater and 2 for saltwater.

6. The laboratory shall document the analyses performed under (b)3, 4 and 5 above.

7. A source of laboratory grade fresh water shall be considered to be of constant quality if the monthly ranges of total hardness, alkalinity, conductivity, and salinity are less than 10 percent of the average values, and the pH range is less than 0.4 standard units.

8. No adjustment to the salinity of a natural saltwater shall be made except, when necessary, as follows:

i. To reduce the salinity of the water, the laboratory may add either laboratory pure water or laboratory grade freshwater; or

ii. To increase the salinity, the laboratory may add hypersaline brine prepared in accordance with the procedure specified in the NJDEPE, "Standardized Culturing Method for the Sheepshead Minnow, Cyprinodon variegatus," #CM004, commercial dry sea salts, or a strong solution of artificial laboratory grade saltwater.

9. Before using laboratory grade saltwater obtained from natural sources to culture invertebrate species, the laboratory shall filter the water through a filter no larger than 20 microns.

(c) A laboratory performing acute toxicity tests shall clean the equipment and containers used in the tests, pursuant to the procedures listed in (c)1 through 3 below.

1. The laboratory shall clean all new materials and containers, except for approved materials marked and sold as "Medical Grade" or "Food Grade," using the procedures in N.J.A.C. 7:18–7.3(a)1vii.

2. The laboratory shall clean all reusable test vessels, sample containers, toxicant delivery systems, and any other equipment used in testing that has come in contact with a toxicant or effluent. To clean the equipment, the laboratory shall:

i. Scrub in a one percent solution, preferably 50 degrees Celsius or warmer, of a non-toxic, phosphate free, synthetic laboratory detergent, such as Linbro 7X® tissue cleaning agent, and tap water;

ii. Rinse three times in hot tap water;

iii. For organic contamination or stains that are not removed after using the procedures in (c)2i and ii above, rinse or soak in a 200 mg/L solution of sodium hypochlorite. Do not use acid and hypochlorite together;

iv. Rinse the equipment three times with laboratory pure water;

v. To remove heavy metal contamination, soak smaller equipment or containers in freshly prepared five percent by volume or stronger HCl for at least one hour. Rinse equipment or containers too large to soak twice with fresh five percent by volume or stronger HCl;

vi. Rinse at least three times in laboratory pure water;

vii. Rinse twice with fresh 100 percent acetone followed by two rinses with 100 percent methanol;

viii. Rinse three times with laboratory pure water; and

ix. Either air or oven dry.

3. After each use, the laboratory shall clean all reusable glassware, tanks, containers, and equipment used for culturing and for dilution water sampling and delivery for testing. To clean the equipment, the laboratory shall:

i. Scrub in a one percent solution, preferably 50 degrees Celsius or warmer, of non-toxic, phosphate free, laboratory detergent, such as Linbro 7X® tissue culture cleaning agent, and either laboratory grade freshwater or tap water;

ii. If contamination with disease or parasites is suspected, disinfect the tanks, equipment and containers by either of the following:

(1) Soak for at least one hour with either a 200 mg/L solution of sodium hypochlorite or a 0.5 percent solution of commercial chlorine bleach; or

(2) Rinse with either a 200 mg/L solution of sodium hypochlorite or a 0.5 percent solution of commercial chlorine bleach; or;

(3) Autoclave at a temperature of 121 degrees Celsius and a pressure of 1.1 lb. per cm^2 (15 psi) for 15 minutes;

iii. If not autoclaving, rinse at least three times with either hot laboratory grade fresh water or tap water; and

iv. Rinse at least three times with laboratory pure water;

(d) A laboratory performing acute toxicity tests shall use only organisms approved by the Department and identified to species using systematic keys appropriate for the test organism. The approved test organisms for acute toxicity testing are as follows:

1. If the receiving water immediately downstream of the discharge being tested has a natural salinity of less than or equal to 3.5 parts per thousand (ppt) at mean high tide, the laboratory shall use the following freshwater organisms as specified in the applicable NJPDES permit:

i. The following species of cold-water fishes:

(1) Rainbow trout—*Oncorhynchus mykiss*

(2) Brown trout—Salmo trutta;

(3) Brook trout—Salvelinus fontinalis.

ii. The following species of warmwater fishes:

(1) Fathead minnow—*Pimephales promelas*

(2) Bluegill—*Lepomis macrochirus*

iii. The following invertebrate species of freshwater zooplankton:

(1) Daphnid—Daphnia magna;

(2) Daphnid—Daphnia pulex;

(3) Cladoceran—Ceriodaphnia dubia.

2. If the receiving water immediately downstream of the discharge being tested has a natural salinity, at mean high tide, of greater than 3.5 ppt, or if the receiving water is a marine water (that is, a tidal saltwater), the laboratory shall use the following saltwater organisms as specified in the applicable NJPDES permit:

i. The following estuarine and marine species of saltwater fishes:

(1) Sheepshead minnow—*Cyprinodon variegatus*;

(2) Tidewater silverside—Menidia peninsulae;

(3) Atlantic silverside—Menidia menidia;

(4) Inland silverside—Menidia beryllina.

ii. The following marine and estuarine invertebrate species of saltwater macrocrustaceans:

(1) Grass shrimp—*Palaemonetes pugio*

(2) Mysid—*Mysidopsis bahia*

(e) A laboratory performing acute toxicity tests shall prepare test organisms in accordance with the following requirements:

1. All organisms used in a test shall be from the same source, the same age group or life stage, and the same species.

i. All fish shall be from the same year class and the total length of the longest fish shall not be more than twice that of the shortest fish. The laboratory shall make the total length measurements either upon a 10 percent sample of each group of organisms used for a test, or upon all of the surviving control test organisms after a test.

ii. The laboratory shall use test organisms collected from the sources listed in (e)1ii(1) through (4) below.

(1) Daphnids and Cladoceran used for toxicity tests shall be reared in the testing facility from laboratory cultures;

(2) Warm-water, estuarine and marine fishes and macrocrustaceans shall be obtained from commercial suppliers, hatcheries, or laboratory cultures. If such fishes or macrocrustaceans are not available from any such sources, they may be obtained from the wild;

(3) Cold-water fishes shall be obtained from commercial suppliers or hatcheries, certified disease-free (free of infections, pancreatic necrosis, furunculosis, kidney disease, and whirling disease);

(4) The laboratory shall not use organisms captured by the use of electroshocking, chemical treatment, and gill nets for either toxicity testing or culture brood.

iii. The laboratory shall determine the age of test organisms at the beginning of a toxicity test. The age of the test organisms shall satisfy the following requirements:

(1) Daphnia magna or D. pulex shall be neonates between one and 24 hours old;

(2) *Ceriodaphnia dubia* shall be less than 24 hours old;

(3) Mysidopsis sp shall be between one and five days old, and no more than a 24 hour range in age;

(4) Pimephales promelas and Lepomis macrochirus shall be one to 14 days old, and no more than a 24 hour range in age;

(5) The coldwater fishes shall be:

(A) Oncorhynchus mykiss—15 to 30 days (after yolk sac absorption to 30 days)

(B) Salvelinus fontinalis—30 to 60 days

(C) Salmo trutta—30 to 60 days

(6) Cyprinodon variegatus shall be one to 14 days old, and no more than a 24 hour range in age;

(7) Menidia menidia, M. peninsulae, and M. beryllina shall be nine to 14 days old, and no more than a 24 hour range in age; and

(8) Palaemonetes pugio shall be one to 60 days old.

2. The laboratory shall satisfy the following requirements in collecting test organisms for use in toxicity testing:

i. If using laboratory-reared specimens, report the original source and strain;

ii. If collecting organisms from the wild, or obtaining organisms from a commercial supplier or hatchery, report the time, place and method of collection, transportation, and handling;

iii. Do not collect organisms from areas known to be polluted;

iv. Do not collect organisms in poor condition, such as organisms that are diseased, parasitized, or exhibit deformities;

v. Collect macrocrustaceans and smaller fishes (with a total length of less than 30 mm) near shore using dip nets or coarse plankton nets, or by hand. Collect larger specimens in seines. If the specimens are located offshore then trawls shall be used.

(1) To prevent organisms from being damaged during collection, short hauls with a duration of 10 minutes or less shall be made with seines or trawls. The nets shall not collect debris that will injure the organisms;

(2) The seine bag shall be left in the water at the end of a haul. Organisms shall be dipped with a container from the bag and transferred directly to prepared holding tanks. Do not collect allow overcrowding of the animals. When trawling, bring the trawl up to the boat and over the side quickly without letting the catch hit the side of the boat. Immerse the portion of the net with the catch in it in a tank of water. Open the trawl, dip out organisms with a container or a small mesh hand net, and transfer to a holding tank;

(3) The water temperature, salinity, dissolved oxygen, and pH shall be determined at the collection site and recorded in a log. During transport to and acclimation in the laboratory, the organism holding tanks shall be aerated to ensure dissolved oxygen levels at or near saturation. Dissolved oxygen levels in the holding tanks shall not fall below 60 percent saturation. The holding tank water temperature shall be maintained within ±three degrees Celsius of the temperature of the water at the collection site at the time of collection for at least 24 hours;

(4) When collecting freshwater fish, between 0.1 and 0.3 percent table salt (NaCl) should be added to the holding tank water prior to the introduction of the collected specimens;

(5) Prophylactic treatments with antibiotics shall not be used; and

(6) Collected organisms shall be observed for injury. Injured organisms shall be discarded.

3. The laboratory shall use only test organisms that have been held, handled and conditioned in accordance with the following requirements:

i. All field collected organisms shall be quarantined for at least fourteen days to observe for parasites and diseases, and to recover from the stress of collection and transport. Test organisms obtained from a culture source with demonstrated ability to supply healthy, disease-free stock shall be quarantined for at least two days. Organisms in culture in the testing facility do not need to be quarantined before use in a toxicity test. A log shall be kept documenting the test organism quarantine procedures used, recording the observations (physical measurements and biological) made, and recording any mortality;

(1) If during quarantine more than 10 percent of the organisms either die within two days of their arrival in the laboratory or if they suffer from parasites or diseases that cannot be controlled, the entire batch of organisms shall be destroyed. All containers and equipment that came in contact with the organisms shall be cleaned and sterilized before reuse by the procedures specified in (e)3i(2) below.

(2) To sterilize tanks, containers or equipment, the laboratory shall use at least a one-hour soaking in either a 200 mg/L sodium hypochlorite solution or a 0.5 percent solution of commercial chlorine bleach. The residual chlorine shall be removed by rinsing at least three times with either laboratory grade or laboratory pure water. Disinfection by autoclaving shall also be acceptable as specified in (c)3ii(3) above.

ii. After the quarantine period, disease-free organisms shall be acclimated to laboratory grade water and temperature, or to test dilution water and test temperature.

(1) Acclimation of fish and grass shrimp to either laboratory grade water or test dilution water shall be done by gradually and incrementally making no more than a 50 percent tank volume exchange of water in each holding tank per 12 hours over a 24 hour period;

(2) Mysids are collected from gravid females held in culture water at a salinity within ±two ppt of the dilution water to be used in the test and Daphnids and Cladoceran are transferred from stock cultures held in laboratory grade water to the test dilution water. No other acclimation would be necessary for these organisms;

(3) Changes in water temperature shall not exceed three degrees Celsius within a 24–hour period.

(4) Changes in salinity during acclimation shall not exceed three ppt in a 12–hour period.

iii. Organisms used in range-finding toxicity tests do not have to be acclimated to the test dilution water and test temperature prior to use in a test; the organisms shall have been acclimated to laboratory grade water and laboratory temperature for at least two days, in accordance with the procedures in (e)3ii(1) through (4) above.

iv. Organisms to be used in N.M.A.T. definitive and definitive acute toxicity tests shall be acclimated to the test dilution water and the test temperature prior to their use in the toxicity test. Acclimation shall be performed in accordance with the criterion stated in (e)3ii(1) through (4) above. If the organisms were held in laboratory grade water, and the laboratory grade

water is to be used as test diluent water, and the holding temperature is identical to the test temperature, then acclimation is not necessary.

v. After the test organisms are acclimated to laboratory grade water and laboratory temperature, or to the test temperature and dilution water, the laboratory shall hold the test organisms under conditions of salinity and temperature that do not change more than specified in (e)3ii(3) and (4) above, for the following periods:

(1) Fish and grass shrimp shall be held for at least 24 hours prior to use in a test; and

(2) Daphnids, Cladoceran and Mysids do not have to be held any additional time prior to use in a test.

vi. If more than five percent of a group of test organisms dies during the acclimation and holding period, the laboratory shall take the following steps:

(1) For Daphnids, Cladoceran or Mysids, discard the group, and acclimate and hold a new group; and

(2) For fish or grass shrimp, either discard the group or hold it for an additional ten days in the test dilution water and at test temperature. If mortality for the group of organisms is more than three percent during the final 48 hours of the additional 10 days of holding, discard the entire group, and acclimate and hold a new group.

vii. The laboratory shall satisfy the following requirements in handling organisms:

(1) Follow culturing activities and procedures designed to minimize handling;

(2) Discard organisms that touch dry surfaces, are dropped, or are injured during handling;

(3) Do not use dip nets made of small mesh netting or cloth for organisms smaller than 0.01 grams each. Handle organisms smaller than 0.01 grams by a large-bore pipette;

(4) Use fire-polished smooth glass tubes or large-bore pipettes for transferring Daphnids, Cladoceran and Mysid;

(5) Clean and sanitize nets and other equipment used for handling organisms between uses;

(6) Analysts shall wash their hands with detergent leaving no toxic residue before handling or feeding organisms;

(7) Maintain dissolved oxygen concentrations in containers for holding fishes, mysids or grass shrimp between 60 percent and 100 percent of saturation. If there is danger of supersaturation with gases, keep the water in an open system, passed over baffles or otherwise aerated to bring it into equilibrium with the air;

(8) Thoroughly clean tanks and equipment regularly, removing or flushing out excessive growths and wastes;

(9) Remove all uneaten food from tanks and containers within 24 hours of feeding;

(10) Cover tanks and containers to prevent organisms from jumping out, unless the nature of the organism and the distance between the top of the water and the top of the container make it unlikely that the organisms can jump out;

(11) Shield tanks and containers to protect organisms from nearby movements and noise;

(12) In flow-through holding tanks without any form of biofiltration, maintain an exchange rate of at least two tank-volumes per 24 hours;

(13) In holding tanks with recirculation systems, maintain a flow of water through the biofiltration systems sufficient to ensure removal of excreted nitrogen compounds and excess suspended solids;

(14) Shrimp and bottom-dwelling fish may be provided with either a silica sand substrate or an oyster shell/crushed coral substrate in the holding tanks;

(15) Feed Daphnids, Cladoceran and coldwater freshwater fish until the beginning of a test but not during the test. Feed Mysids and grass shrimp before and during a test. Feed all warmwater freshwater and all saltwater fish before the beginning of the test and at two hours prior to the 48 hour renewal;

(16) Each day during holding and acclimation, observe organisms carefully for signs of disease, stress, damage, and mortality. Record observations in a log. Discard injured, dead and abnormal individuals; and

(17) Do not use organisms used in a test (including those used in a control treatment) in a subsequent test, or as culture stock.

4. The laboratory shall comply with the following procedures when culturing test organisms:

i. Maintain a daily log of organism feeding, behavioral observations, treatments, and mortalities;

ii. Feed all organisms, except for daphnids and Cladoceran at least once per day;

iii. Destroy zooplankton and saltwater macrocrustaceans that become diseased or infested. If fishes are treated to either prevent or cure diseases, fungal infections or parasitic infections, with any material other than table salt (NaCl), the laboratory shall:

(1) If contamination with disease or parasites is suspected, disinfect the tanks, equipment and containers by one of the following:

(A) Soak for at least one hour with either a 200 mg/L solution of sodium hypochlorite or a 0.5 percent solution of commercial chlorine bleach, and then rinse at least three times with laboratory grade or pure water; or

(B) Rinse with either a 200 mg/L solution of sodium hypochlorite or a 0.5 percent solution of commercial chlorine bleach and then rinse at least three times with laboratory grade or pure water; or

(C) Autoclave using the procedures specified in (c)3ii(3) above;

(2) The laboratory shall not use in toxicity tests fish from tanks contaminated with parasites or disease, until:

(A) Seven days since the contamination have elapsed, and there is no evidence of disease; and

(B) Ten days have elapsed after all treatments are stopped.

iv. The Department recommends that a laboratory culturing test organisms use the applicable method listed in (e)4iv(1) through (7) below.

(1) The Department recommends that a laboratory culturing Oncorhynchus mykiss, Salmo trutta, or Salvelinus fontinalis do so in accordance with "Standardized Culturing Methods for Cold-water Fishes," NJDEPE—#CM001.

(2) The Department recommends that a laboratory culturing Pimephales promelas do so in accordance with "Standardized Culturing Methods for the Fathead Minnow, Pimephales promelas" NJDEPE—#CM002.

(3) The Department recommends that a laboratory culturing Daphnia magna or D. pulex do so in accordance with "Standardized Culturing Methods for Daphnia magna and Daphnia pulex and Ceriodaphnia dubia," NJDEPE—#CM003.

(4) The Department recommends that a laboratory culturing Cyprinodon variegatus do so in accordance with "Standardized Culturing Methods for the Sheepshead Minnow," NJDEPE—#CM004.

(5) The Department recommends that a laboratory culturing Palaemonetes pugio shall do so in accordance with "Standardized Culturing Methods for Grass Shrimp," NJDEPE—#CM005.

(6) The Department recommends that a laboratory culturing Menidia menidia, M. beryllina, or M. peninsulae do so in accordance with "Standardized Culturing Methods for the Atlantic, Tidewater, and Inland Silversides," NJDEPE—#CM006.

(7) The Department recommends that a laboratory culturing Mysidopsis bahia do so in accordance with "Standardized Culturing Methods for Mysid Shrimp," NJDEPE—#CM007.

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

7:18–7.5 Acute toxicity testing methodology

(a) A laboratory shall not use an acute toxicity test experimental design unless it satisfies all applicable requirements of this section.

(b) When the purpose of a definitive acute toxicity test is to determine compliance with an LC_{50} or EC_{50} permit limitation, the test shall satisfy all of the following requirements:

1. The test shall include at least one control treatment, and a series of at least five effluent concentrations;

2. The laboratory shall perform each control treatment and each effluent concentration at least in duplicate, and shall conduct additional replicate series when necessary to achieve required test precision. The laboratory shall use only true replicates, with no water connections between test chambers;

3. If the toxicity of the effluent to the test organism is not known, the laboratory shall select concentrations that are evenly spaced on either a logarithmic scale or a geometric scale. The concentration of effluent in each treatment (except for the highest concentration and each control) shall be at least 50 percent of the next highest one;

4. If the toxicity of the effluent to the test organism is known approximately, the laboratory shall select concentrations of effluent that are evenly spaced (on either a logarithmic scale or geometric scale) around the expected LC_{50} or EC_{50}. Except for the highest concentration and each control(s), the test concentration shall be at least 60 percent of the next higher one. The use of a 100 percent effluent concentration is not required where the inclusion of such concentration is not within the expected range of the LC_{50};

5. Every toxicity test shall include a dilution water control treatment consisting of the same dilution water, conditions, procedures, type and number of organisms as used in the effluent treatments, except that the laboratory shall add none of the effluent being tested to the dilution water. Whenever the laboratory uses artificial sea salts to adjust the salinity of either the dilution water sample or effluent sample, an additional control treatment shall be included. This additional control treatment shall consist of replicate chambers containing only artificial saltwater, made with the same artificial sea salts used to adjust the samples. The artificial saltwater shall be made to the same standardized salinity and pH as the other test treatments; and

6. The laboratory shall expose at least 20 test organisms to each effluent concentration and each control treatment. For example, when the laboratory is conducting the test in duplicate, it shall expose at least 10 organisms per test chamber. The number of organisms used in each effluent concentration shall be equal to the number used in other effluent concentrations and to the number used in the control.

(c) When the effluent is known to generally have an LC_{50} of greater than or equal to 100 percent and the laboratory is conducting an N.M.A.T. definitive acute toxicity test for determining compliance with a "no measurable acute toxicity" permit limitation, the toxicity test design shall meet the following requirements:

1. The test series shall consist of one or more control treatments, a 100 percent effluent-by-volume concentration and a 50 percent effluent-by-volume concentration;

2. The test shall be conducted with at least four replicates. The laboratory shall conduct additional replicates when necessary to achieve the required test precision. The laboratory shall use only true replicates, with no water connections between test chambers;

3. The laboratory shall expose at least 10 test organisms per chamber to each effluent concentration;

4. Every toxicity test shall include a dilution water control treatment consisting of the same dilution water, conditions, procedures, type and number of organisms as used in the effluent treatments, except that the laboratory shall add none of the effluent being tested to the control treatment. Whenever the laboratory uses artificial sea salts to adjust the salinity of either the dilution water sample or the effluent sample, an additional control treatment shall be included. This additional control treatment shall consist of replicate chambers containing only artificial saltwater, made with the same artificial sea salts used to adjust the samples. The artificial saltwater shall be made to the same standardized salinity as the other test treatments; and

5. The laboratory shall expose at least 40 test organisms to each control treatment and each effluent treatment.

(d) When there is no historical aquatic toxicological data available on an effluent, the laboratory shall conduct a range-finding toxicity test to ascertain the range of effluent concentrations for subsequent definitive tests. The range-finding toxicity test shall satisfy the following requirements:

1. The range-finding toxicity test shall consist of one or more control treatments, and at least four treatments which shall include a 100 percent effluent-by-volume, 50 percent effluent-by-volume, and 12.5 percent effluent-by-volume. The laboratory shall use either a single test series or replicates;

2. Every range-finding test shall include a dilution water control treatment. This treatment shall consist of the same dilution water, conditions, procedures, type and number of organisms as used in the effluent treatment, except that none of the effluent being tested shall be added to the dilution water; and

3. Five or more test organisms shall be exposed to each control treatment and each effluent treatment.

(e) The laboratory shall conduct tests as either static, renewal or flow-through tests in accordance with the following:

1. The laboratory shall conduct the following as either a renewal test or a flow-through test:

i. Any definitive toxicity test with cold-water fishes, warm-water fishes, saltwater fishes or saltwater macrocrustaceans; and

ii. Any N.M.A.T. definitive toxicity test with cold-water fishes, warm-water fishes, saltwater fishes or saltwater macrocrustaceans;

2. The laboratory shall conduct as either a static test or a flow-through test any range-finding toxicity test with coldwater fishes, warmwater fishes, saltwater fishes or saltwater macrocrustaceans; and

3. The laboratory shall conduct the following as a static test:

i. Any definitive toxicity test with freshwater zooplankton;

ii. Any N.M.A.T. definitive toxicity test with freshwater zooplankton; and

iii. Any range-finding toxicity test with freshwater zooplankton.

(f) The laboratory shall conduct toxicity tests for the durations described below:

1. Daphnid and Cladoceran range-finding toxicity test duration shall be at least 24 hours;

2. Daphnid and Cladoceran definitive toxicity test and N.M.A.T. definitive toxicity test durations shall be 48 hours;

3. Mysid range-finding toxicity test duration shall be at least 24 hours;

4. Mysid definite toxicity test and N.M.A.T. definitive toxicity test durations shall be at least 96 hours;

5. Grass shrimp range-finding toxicity test duration shall be at least 24 hours;

6. Grass shrimp definitive and N.M.A.T. definitive toxicity test durations shall be at least 96 hours;

7. The duration of any range-finding toxicity test done with fishes shall be at least 24 hours; and

8. The duration of any definitive toxicity test with fishes or any N.M.A.T. definitive toxicity test with fishes shall be at least 96 hours.

(g) Laboratories shall conduct toxicity tests with the test organisms randomly distributed to the test chambers by either of the two following methods:

1. Adding to each chamber no more than 20 percent of the total number to be assigned to each chamber, then repeating the process until each test chamber contains the total number of test organisms desired; or

2. Randomly assigning one test organism to each test chamber, then randomly assigning a second test organism to each test chamber, etc., continuing the random assignments until the total number of test organisms desired has been distributed to each test chamber.

(h) The laboratory shall maintain dissolved oxygen in the test chambers in accordance with the following requirements:

1. At all times during testing with cold-water fish species, the laboratory shall maintain dissolved oxygen at greater than 60 percent of saturation;

2. At all times during testing with other species, the laboratory shall maintain dissolved oxygen at greater than 40 percent of saturation;

3. In static and renewal acute toxicity tests, the laboratory shall gently aerate all test chambers if dissolved oxygen falls below 60 percent of saturation for the freshwater coldwater fishes or below 40 percent of saturation for the freshwater warmwater fishes and all saltwater species. If aeration is not going to be continuous, the laboratory shall stop aeration when dissolved oxygen reaches 100 percent of saturation for the freshwater coldwater fishes, or 60 percent of saturation for the freshwater warmwater fishes and all saltwater species;

4. In flow-through toxicity tests, the laboratory shall gently aerate all test chambers while maintaining the turnover rate if the dissolved oxygen falls below 70 percent of saturation for freshwater coldwater fishes, or below 50 percent of saturation for the freshwater warmwater fishes and all saltwater species. If aeration is not going to be continuous, the laboratory shall stop aeration when dissolved oxygen reaches 100 percent of saturation for the freshwater coldwater fishes or 60 percent of saturation for the freshwater warmwater fishes and for the saltwater species; and

5. In static testing with Daphnids and Cladoceran, the laboratory shall measure dissolved oxygen either on the test solutions that are used in the acute toxicity test, or on a duplicate series of test solutions not containing test organisms. The laboratory shall perform zero hour of exposure measurements either upon an aliquot of the solutions being dispensed to the test chambers, or upon a duplicate series of test solutions set up as another replicate without test organisms. The laboratory shall measure dissolved oxygen for all test concentrations and the control at zero (0) and 48 hours. The laboratory shall measure dissolved oxygen at 24 hours for those test concentrations where there is 100 percent mortality or immobilization. The laboratory shall not aerate Daphnid or Cladoceran test chambers under any circumstances, even if dissolved oxygen levels fall below 40 percent of saturation.

(i) The laboratory shall maintain test temperatures in accordance with the following requirements:

1. Freshwater organisms shall be tested at the following temperatures:

i. Cold-water fishes shall be tested at 12 degrees Celsius; and

ii. Warm-water fishes and freshwater zooplankton shall be tested at 20 degrees Celsius;

2. Saltwater organisms shall all be tested at 20 degrees Celsius.

3. The laboratory shall maintain the temperature of test solutions within ±2.0 degrees Celsius of the required test temperature.

(j) The laboratory shall test sheepshead minnow, inland silverside, grass shrimp, and Mysid at a salinity of five ppt to 32 ppt, ±10 percent. The laboratory shall test the tidewater silverside and Atlantic silverside at a salinity of 15 ppt to 32 ppt, ±10 percent. A standardized salinity should be 25 ppt, ±one ppt for all saltwater organisms.

(k) The laboratory shall provide test organisms with light during testing in accordance with the following requirements:

1. The laboratory shall provide Daphnids and Cladoceran with wide spectrum light at an intensity of 50 to 100 foot candles, measured at the surface of the test chamber solutions. The photoperiod shall be a steady 16 hours light and eight hours dark;

2. The laboratory shall provide Mysidopsis sp. and Palaemonetes pugio with wide spectrum light at an intensity of 50 to 100 foot candles measured at the surface of the test chamber solutions. The photoperiod shall be a steady 14 to 16 hours light and eight to 10 hours dark; and

3. The laboratory shall provide freshwater and saltwater fishes with wide spectrum light at an intensity of 50 to 100 foot candles, measured at the surface of the test chamber solutions. The photoperiod shall be a steady 14 to 16 hours light and eight to 10 hours dark.

(*l*) For static or renewal toxicity tests the test organism loading shall not exceed the following:

1. Loading of grass shrimp and coldwater, warmwater, and saltwater fishes shall not exceed 0.65 g/L of test solution;

2. Loading of Daphnids and Cladoceran shall not exceed one daphnid per 20 mL of test solution; and

3. Loading of Mysids shall not exceed one mysid per 40 mL of test solution.

(m) For flow-through toxicity tests the test organism loading shall not exceed the following:

1. Loading of grass shrimp and coldwater, warmwater, and saltwater fishes shall not exceed five g/L of test solution; and

2. Loading of Mysids shall not exceed one mysid per 20 mL of test solution.

(n) The laboratory shall take organisms for use in testing only from groups that meet the requirements in N.J.A.C. 7:18–7.4(e)3vi concerning mortality during acclimation and holding.

(*o*) When an effluent discharged to estuarine or marine waters consists of adulterated freshwater, the laboratory shall adjust the salinity of the effluent only in accordance with the following:

1. When using effluent concentrations greater than 75 percent effluent-by-volume, the laboratory shall adjust the salinity of the effluent test concentrations by using artificial sea salts. In the case of effluent/dilution water mixtures, the laboratory shall add the salts to the effluent either before or after the effluent and dilution water sample aliquots are mixed;

2. When using effluent concentrations less than or equal to 75 percent effluent-by-volume, the laboratory shall adjust the salinity of the effluent test concentrations by using either a hypersaline brine that is prepared in compliance with N.J.A.C. 7:18–7.4(b)8, or dry artificial sea salts. The laboratory shall make the adjustments either before or after the effluent and dilution water samples are mixed; and

3. When a laboratory is using artificial sea salts to adjust the freshwater effluent salinity, and the pH of the test concentration to which the artificial sea salts were added drifts more than 0.5 pH units from the initial pH, the laboratory shall also adjust the pH of the test concentration to within 0.5 pH units of the pH of the original test concentration by using NaOH or HCl. The laboratory shall document and report adjustments and treatments of the effluent along with the test results. The laboratory shall include in the documentation the name and amount of reagent used to adjust the pH, and the pH before and after pH adjustment.

(p) To initiate a static or renewal test, the laboratory shall place the test organisms in the test chambers within 30 minutes after the effluent is added to the dilution water.

(q) To initiate a flow-through test, the laboratory shall place the test organisms in test chambers after the dilutor system has been calibrated, with the dilution water and effluent, and the test solutions have been flowing through the test chambers for a period of 24 hours at a rate which ensures five 90 percent replacements of water volume in each test chamber. During this period, the laboratory shall make all necessary adjustment to flow rate, temperature, and aerations.

(r) The laboratory shall feed test organisms during toxicity testing in accordance with N.J.A.C. 7:18–7.4(e)3vii(15) and the following requirements:

1. The laboratory shall feed Daphnids, Cladoceran and freshwater coldwater fish up to but not during acute toxicity testing;

2. The laboratory shall feed Mysids and grass shrimp up to and during acute toxicity testing. During testing, the laboratory shall feed the Mysids and grass shrimp at a rate of 0.1 mL concentrated hatched Artemia per Mysid and grass shrimp twice daily, which is approximately 100 brine shrimp nauplii/Mysid/day; and

3. The laboratory shall feed warmwater freshwater and saltwater fish up to the beginning of the acute toxicity test. During testing, the laboratory shall feed the fish at a rate of 0.2 mL concentrated hatched Artemia two hours prior to the 48 hour test solution renewal.

(s) The laboratory shall collect biological data and make biological observations in accordance with the following requirements:

1. To determine the effluent's EC_{50} in acute toxicity tests with Daphnids and Cladoceran, the laboratory shall observe and record the organisms' immobilization, defined as the inability to move the appendages when gently prodded;

2. To determine the effluent's LC_{50} in acute toxicity tests with all fishes, mysids and grass shrimp, the laboratory shall measure death, defined as no movement of any kind, especially the absence of respiratory movements, and no reaction to gentle prodding;

3. The laboratory shall count the number of dead or affected organisms in each test chamber at each 24 hour exposure interval throughout the test and, to intercept potential problems, these observation should occur at least twice daily;

4. The laboratory shall remove dead organisms from test chambers at least each time dead or affected organisms are counted;

5. The laboratory shall observe the test organisms' appearance and behavior at least daily, and record the observations on the acute toxicity test bench sheet(s) using the applicable terms or codes in table 7.5(s).

Table 7.5(s)
Terms and Codes for Test Organisms' Appearance and Behavior

General Behavior
Observable responses of the test fish, individually or in groups, to their environment.

Term	Explanation	Code
Quiescent	Marked by a state of inactivity or abnormally low activity; motionless or nearly so.	1
Hyperexcitable	Reacting to stimuli with substantially greater intensity than control fish.	2
Irritated	Exhibiting more or less continuous hyperactivity	3
Surfacing	Rising and remaining unusually long at the surface	4
Sounding	Diving suddenly straight to the bottom; remaining unusually long at the bottom	5
Twitching	Moving the body or parts of the body with sudden jerky movements	6
Tetanous	In a state of tetany; marked by intermittent tonic spasms of the voluntary muscles	7
Flaccid	Lacking tone, resilience or environmental firmness; weak and enfeebled, flabby	8
Normal	Unaffected by or not exposed to a particular experimental treatment; conforming to the usual behavioral characteristics of the species.	9

Swimming
Progressive self-propulsion in water by coordinated movement of tail, body, and fins

Term	Explanation	Code
Ceased	Broken off or tapered off to a stop	10
Erratic	Characterized by lack of consistency, regularity, or uniformity; fluctuating, uneven; eccentric	11
Gyrating	Revolving around a central point; moving spirally about an axis	12
Skittering	Skimming hurriedly along the surface with rapid body movements	13
Inverted	Turned upside down, or approximately so	14
On side	Turned approximately 90 degrees laterally from the normal body orientation	15

Pigmentation
Color of skin due to deposition or distribution of pigment

Term	Explanation	Code
Light discolored	Color appearance lighter than usual for the species	16
Dark discolored	Color appearance darker than usual for the species	17
Varidiscolored	Color appearance abnormally varied; mottled	18

Integument
The skin

Term	Explanation	Code
Mucus shedding	Observably losing mucous skin coating to an abnormal degree	19
Mucus coagulations	Showing observable clumping or clotting of the mucous skin coating	20
Hemorrhagic	Visibly bleeding as from gills, eyes, anal opening	21

Respiration
Physical action of pumping water into mouth and out through gills, so as to absorb oxygen.

Term	Explanation	Code
Rapid	Observably faster than normal to a significant degree	22
Slower	Observably slower than normal to a significant degree	23
Irregular	Failing to occur at regular or normal intervals	24
Ceased	Broken off or tapered off to a stop	25
Gulping air	Swimming at surface with mouth open and laboriously pumping surface water and air through gills	26
Labored	Performed with apparent abnormally great difficulty and effort	27
Coughing	Periodic flexure of the operculum of fish as to reverse water flow	28

6. The laboratory shall not stress live organisms when determining whether test organisms are dead, immobilized, or otherwise affected, and when removing dead organisms. Any movement of test chambers and any prodding shall be done very gently; and

7. The laboratory shall determine the weights and lengths of test fish and grass shrimp by weighing, measuring and discarding at least a 10 percent sample of the batch of organisms to be used in the test, or by weighing and measuring the surviving control organisms after the test. For test fish, the laboratory shall determine the total length; for grass shrimp, the laboratory shall measure from rostrum to telson.

(t) The laboratory shall collect and analyze chemical and physical data in accordance with the following requirements:

1. The laboratory shall analyze all chemical and physical parameters (excluding salinity) under this subchapter in accordance with the requirements set forth in 40 C.F.R. 136 and N.J.A.C. 7:18–5.3;

2. The laboratory shall compute salinity based on chlorinity, electrical conductivity, or refractive index;

3. If an effluent has exhibited, or is known to exhibit, a high dissolved oxygen demand, the laboratory shall monitor dissolved oxygen at the following frequency except as provided in (t)5 below:

i. For the first four hours of testing, once every two hours in all of the control and effluent test chambers; and

ii. After the first four hours of testing, at least once daily in each test chamber in which there are living test organisms;

4. If the effluent has not exhibited, nor is known to exhibit, a high dissolved oxygen demand, the laboratory shall monitor dissolved oxygen at least once every 24 hours in all of the control and effluent test chambers, except as provided in (t)5 below;

5. When testing with Daphnids and Cladoceran, the laboratory shall monitor dissolved oxygen in accordance with N.J.A.C. 7:18–7.5(h)5 above;

6. When a laboratory conducts a toxicity test in either a constant temperature area or water bath:

i. The laboratory shall measure and record the temperature of the area or bath when the test is initiated, at least once every six hours during the test, and upon termination of the test;

ii. When testing with Daphnids and Cladoceran, the laboratory shall measure and record the temperature in a blank test chamber (a chamber without test organisms), at least daily;

iii. When testing with fish, grass shrimp or Mysids, the laboratory shall measure and record the temperature in each test chamber, including the control exposure;

7. When a toxicity test is not conducted in a constant temperature area or water bath, the laboratory shall measure and record the temperature in at least one control test chamber and one effluent concentration test chamber at least hourly throughout the test. The laboratory shall measure and record the other test chamber temperatures at least once daily throughout the test;

8. A laboratory performing a static acute toxicity test shall collect the following chemical and physical data, in addition to the data described in (t)1 through 7 above:

i. In toxicity tests using freshwater dilution water, just before initiating the test the laboratory shall measure and record hardness, pH, total residual chlorine (when detected initially in either the dilution water or effluent sample), and specific conductance. If the laboratory is performing definitive testing with Daphnids and Cladoceran, it shall also measure and record the above information upon the termination of the test. For all tests, the laboratory shall make these measurements on aliquots of the same test solutions used to set up the test initially; and

ii. In toxicity tests using saltwater dilution water, just before initiating the test the laboratory shall measure and record pH, salinity, and total residual chlorine (when detected initially in the effluent sample). For all tests, the laboratory shall make these measurements on aliquots of the same test solutions used to set up the test initially;

9. A laboratory performing a flow-through or renewal toxicity test shall collect the following chemical and physical data, in addition to the data described in (t)1 through 7 above:

i. In toxicity tests using a freshwater dilution water, the laboratory shall measure and record just before test initiation pH, hardness, total alkalinity, total residual chlorine (when detected initially in either the dilution water or effluent sample), and specific conductance. In addition, the laboratory shall measure and record the pH, and specific conductance once every 24 hours during the test, and upon termination of the test in at least one set of replicate chambers that includes the control and all effluent concentrations. Also once every 24 hours during the test, the laboratory shall measure and record the hardness, total alkalinity, and total residual chlorine (when detected initially in either the dilution water or effluent sample) once every 24 hours during the test, and upon termination of the test in at least one set of replicate chambers that includes the control and the highest effluent concentration. The laboratory shall take all the measurements either upon aliquots of the same test solutions or upon aliquots taken from the test chambers.

ii. In toxicity tests using saltwater dilution water, the laboratory shall measure and record just before test initiation pH, total alkalinity, total residual chlorine (when detected initially in either the dilution water or effluent sample), and salinity. In addition, the laboratory shall measure and record the pH and salinity once every 24 hours during the test, and upon termination of the test in at least one set of replicate chambers that includes the control and all effluent concentrations. Also once every 24 hours during the test, the laboratory shall measure and record the total alkalinity and total residual chlorine (when detected initially in either the dilution water or effluent sample) once every 24 hours during the test, and upon termination of the test in at least one set of replicate chambers that includes the control and the highest effluent concentration. The laboratory shall take all the measurements either upon aliquots of the same test solutions or upon aliquots taken from the test chambers.

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

7:18–7.6 Calculating, analyzing and reporting of quantal test results

(a) A toxicity test is invalid if any of the conditions listed in (a)1 through 5 below occurs. When a toxicity test is invalidated, the laboratory shall clearly mark the test results accordingly. The laboratory shall submit the results to the Department, along with a written explanation as to the reason for the invalidation and the expected date that the test will be repeated. If a toxicity test is invalidated, the laboratory shall repeat the test as soon as possible within the monitoring period specific in the permit. A toxicity test is invalid if:

1. In an N.M.A.T. test, mortality of the control test organisms exceeds 10 percent;

2. In tests determining either an EC_{50} or an LC_{50}, greater than 10 percent of the control test organisms either show the effect or exhibit mortality;

3. In definitive tests determining an LC_{50} or an EC_{50}, after pooling replicate test chamber responses two or more test concentrations deviate significantly from the expected trend of increasing effluent concentrations exhibiting increasing levels of toxicity. Deviation in response from the expected trend of greater than 10 percent (mortality for an LC_{50}, or effect for an EC_{50}) shall be considered to be significant;

4. The 95 percent confidence limits cannot be calculated for a test which results in an LC_{50} or EC_{50} that is either less than the highest effluent concentration tested, or greater than the lowest effluent concentration tested. However, the test need not be invalidated if the calculated LC_{50} or EC_{50} lower confidence limit is $\geq$30 percent of the highest effluent concentration tested and the upper confidence limit is a positive infinity; or

5. The laboratory is unable to calculate 95 percent confidence limits when required under (b)4ii below.

(b) A laboratory shall satisfy the requirements of (b)1 through 5 below when calculating toxicity test results.

1. The laboratory shall not use biological test results from N.M.A.T. definitive acute toxicity tests to calculate an LC_{50} or EC_{50}. For all effluent concentrations and the control, the laboratory shall report the number and percentage of dead test organisms or those showing the effect.

2. The laboratory shall express the biological test results from range-finding acute toxicity tests in terms of an LC_{50} or EC_{50} whenever the data support the estimation. The laboratory shall estimate the LC_{50} or EC_{50} by the graphical method described in EPA Acute Methods #027F–1993.

i. When the highest effluent concentration kills or affects less than 50 percent of the test organisms, the laboratory shall record the number of organisms showing the response in each treatment; and

ii. When the lowest concentration kills or affects more than 80 percent of the test organisms, the laboratory shall repeat the range-finding test with a lower set of effluent concentrations, before conducting the definitive toxicity test.

3. The laboratory shall express the biological test results from definitive acute toxicity tests in terms of an estimated LC_{50} or EC_{50}, except when no toxicity is observed. The laboratory shall report the numbers and percentages of test organisms dying (for LC_{50}) or showing the effect (for EC_{50}) for each test chamber.

i. When more than 50 percent of the test organisms die (for LC_{50}) or show the effect (for EC_{50}) in the lowest effluent concentration, the laboratory shall report an LC_{50} or EC_{50} of less than the lowest concentration;

ii. When less than 50 percent of the test organisms die (for LC_{50}) or show the effect (for EC_{50}) in the highest effluent concentration, the laboratory shall report an LC_{50} or EC_{50} of greater than the highest concentration;

4. When the results of a definitive acute toxicity test falls between the two extremes given in (b)3i and ii above, the laboratory shall calculate LC_{50} or EC_{50} values using the following methods and procedures.

i. The laboratory shall calculate LC_{50} or EC_{50} for at least the final exposure time and each 24 hour exposure time between the beginning and the end of the test. For example, in a test with a 96–hour duration, the laboratory would calculate LC_{50} or EC_{50} 24, 48, 72 and 96 hours after the beginning of the test;

ii. The laboratory shall calculate 95 percent confidence limits for each definitive acute toxicity test LC_{50} or EC_{50}. If the laboratory cannot do so, the test shall be invalid in accordance with (a)5 above. This requirement does not apply to any toxicity test that results in an LC_{50} or EC_{50} that has:

(1) Greater than or equal to the highest effluent concentration tested; or

(2) Less than or equal to the lowest effluent concentration tested; or

(3) No partial mortalities.

iii. If any acute toxicity test results in no partial mortalities, the LC_{50} or EC_{50} is determined using the Graphical Method as described in EPA Acute Methods #027F–1993;

iv. If any acute toxicity test results in two or more partial mortalities and a non-significant Chi Square Test, the LC_{50} or EC_{50} and corresponding 95% confidence intervals are determined using the Probit Method as described in EPA Acute Methods #027F–1993.

v. The Spearman-Karber Method, as described in EPA Acute Methods #027F–1993, is used to determine the LC_{50} or EC_{50} and corresponding 95 percent confidence intervals for any acute toxicity test if the following conditions apply:

(1) Zero mortality in the lowest effluent concentration and 100 percent mortality in the highest effluent concentration, and;

(2) One partial mortality, or;

(3) Two or more partial mortalities and a significant Chi Square Test;

vi. If the conditions in (b)4iii, iv, or v do not apply, the LC_{50} or EC_{50} and corresponding 95 percent confidence intervals for any acute toxicity test are determined using the Trimmed Spearman-Karber Method as described in EPA Acute Methods #027F–1993.

5. Upon completing a definitive acute toxicity test for which LC_{50} or EC_{50} can be calculated, the laboratory shall plot a toxicity curve. The laboratory shall plot the curve using the LC_{50} or EC_{50} for each observation time, following the methodology presented in "Standard Methods, 16th Edition" p. 717. The laboratory shall report any threshold or incipient LC_{50} that it can estimate from the curve. If the laboratory finds no threshold or incipient LC_{50}, the laboratory shall report this fact. In either case the laboratory shall include the toxicity curve graph in the report of results whenever the data permit it to be plotted.

(c) The laboratory shall follow the following requirements when reporting results of acute toxicity tests:

1. The laboratory shall complete a sample report immediately after collecting either dilution water or effluent samples. The laboratory shall make the report either as a separate form or as an entry in a bound logbook. The laboratory shall include the sample report data in its report of the toxicity test results to the Department. The laboratory shall include the following information in the sample report:

i. The sampling location;

ii. Date and time of collection;

iii. Total residual chlorine level in the sample;

iv. The type of sample (composite or grab);

v. The material sampled;

vi. The collector's name; and

vii. Any pertinent comments.

2. The laboratory shall include the following types of information when reporting results of an acute toxicity test:

i. The name of the test, the investigator(s), and the laboratory;

ii. The date on which the test began;

iii. The name of NJPDES permittee, its location, its NJPDES permit number, and the Discharge Serial Number;

iv. The name of the receiving water body;

v. A detailed description of the effluent, including the sampling point, date and time of collection, known physical and chemical properties, and variability;

vi. A detailed description of the dilution water source, the sample location, the date and time of sample collection, the tide stage (if applicable), the dilution water chemical characteristics, and any pretreatment;

vii. A description of acute toxicity test method(s) used, including:

(1) The test protocol, a definition of the adverse effect (death, immobility, etc.) used in the test, a description of the test chambers used (including the depth and volume of test solution), the number of test organisms per replicate treatment, the number of replicate treatments, and the loading rate of the test organisms. In flow-through toxicity tests the report shall also include the number of water volume exchanges per 24 hours in each test chamber;

(2) Detailed information about the test organisms, including the scientific name, mean and ranges of length and weight (where appropriate), age, life stage, source, previous history (if known), observed disease, treatments (if any), record of acclimation procedure, and observations on behavior during the test;

(3) A description of any aeration or salinity adjustments performed on test solutions before or during the test;

(4) The methods used for all chemical analyses;

(5) The mean and range of the acclimation temperature, test temperature, and salinity; and

(6) Any deviations from the test method(s);

viii. The test results, including the following:

(1) The results of all chemical analyses of the effluent and dilution water;

(2) A daily record of the number and percentages of organisms in each test chamber, including the control treatments, that died or showed the selected effect;

(3) A summary of general observations of other effects of symptoms of toxicity observed during the test;

(4) The LC_{50} or EC_{50} value with specified exposure time and the 95 percent confidence limits. If the highest effluent concentration did not kill or affect 50 percent or more of the test organisms, report the LC_{50} or EC_{50} as greater than the highest concentration and the percentage of test organisms killed or affected in each experimental treatment. If the lowest effluent concentration killed or affected more than 50 percent of the test organisms, report the LC_{50} or EC_{50} as less than the lowest concentration and the percentage of test organisms killed or affected in each experimental treatment. Report the method(s) used to calculate the LC_{50} or EC_{50}, and its 95 percent confidence limits. Include a graph of the toxicity curve;

(5) Any deviations from approved methodology, along with a summary of the reason(s) for the deviation(s); and

(6) Any other relevant information; and

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).

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 incubator 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 substandard 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):

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/sec^2); 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:

$$R = \frac{Vd}{v}$$

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

v = kinematic viscosity, in feet^2 per second, using the applicable value for v listed below based on the temperature of the discharge.

Temperature	v
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 (HNO_3) for the preservation of samples to be analyzed for copper or lead. If HNO_3 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. HNO_3 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 ($Na_2S_2O_3$)	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 $Na_2S_2O_3$ (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 $Na_2S_2O_3$ (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% $Na_2S_2O_3$ (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 $Na_2S_2O_3$, 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_2SO_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 $Na_2S_2O_3$ (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

Parameter	Preservation	Container ("P" means plastic, hard or soft; "G" means glass, hard or soft.)	Maximum Holding Time
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 $Na_2S_2O_3$ or 7uL $Na_2S_2O_3$ (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
Temperature	None	P or G	Analyze Immediately
Thallium	Conc HNO_3 to pH < 2	P or G	6 months
TTHMs	$Na_2S_2O_3$ 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 (HNO_3) in water solutions at concentrations of 0.15 percent by weight (pH of about 1.62 or greater); Sulfuric acid (H_2SO_4) 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

Parameter	Container ("P" means plastic, hard or soft; "G" means glass, hard or soft.)	Preservation	Maximum Holding Time
Bacterial Tests:			
Coliform (fecal)	P, G	Cool 4°C, 0.008% $Na_2S_2O_3$	6 hours
Coliform (total)	P, G	Cool 4°C, 0.008% $Na_2S_2O_3$	6 hours
Fecal streptococci	P, G	Cool 4°C, 0.008% $Na_2S_2O_3$	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_2SO_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_2SO_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_2SO_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

Parameter	Container ("P" means plastic, hard or soft; "G" means glass, hard or soft.)	Preservation	Maximum Holding Time
Iron-total[3]	P, G	HNO_3 to pH < 2	6 months
Kjeldahl & Organic Nitrogen	P	Cool, 4°C, H_2SO_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
Nitrate-Nitrite (as N)	P, G	Cool 4°C, H_2SO_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_2SO_4 to pH < 2	28 days
Organic carbon-total (TOC)	P, G	Cool 4°C, HCl or H_2SO_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_2SO_4 to pH < 2	28 days
Phosphorus (elemental)	G	Cool 4°C	48 hours
Phosphorus-total	P, G	Cool 4°C, H_2SO_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% $Na_2S_2O_3$	7 days until extraction; 40 days after extraction

Parameter	Container ("P" means plastic, hard or soft; "G" means glass, hard or soft.)	Preservation	Maximum Holding Time
Acenaphthylene[7]	Glass,Teflon®-lined cap	Store in dark Cool 4°C, 0.008% $Na_2S_2O_3$	7 days until extraction; 40 days after extraction
Acrolein	Glass,Teflon®-lined septum	Store in dark Cool 4°C, 0.008% $Na_2S_2O_3$	14 days
Acrylonitrile	Glass,Teflon®-lined septum	Adjust pH to 4-5[6] Cool 4°C, 0.008% $Na_2S_2O_3$	14 days[6]
Anthracene[7]	Glass,Teflon®-lined cap	Adjust pH to 4-5[6] Cool 4°C, 0.008% $Na_2S_2O_3$	7 days until extraction; 40 days after extraction
Benzene	Glass,Teflon®-lined septum	Cool 4°C, 0.008% $Na_2S_2O_3$ HCl to pH 2	14 days
Benzidine[7]	Glass,Teflon®-lined cap	Cool 4°C, 0.008% $Na_2S_2O_3$	7 days until extraction[8]
Benzo(a) anthracene[7]	Glass,Teflon®-lined cap	Cool 4°C, 0.008% $Na_2S_2O_3$ Store in dark	7 days until extraction; 40 days after extraction
Benzo(a)pyrene[7]	Glass,Teflon®-lined cap	Cool 4°C, 0.008% $Na_2S_2O_3$[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% $Na_2S_2O_3$[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% $Na_2S_2O_3$[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% $Na_2S_2O_3$[1]	7 days until extraction; 40 days after extraction
Benzyl chloride	Glass,Teflon®-lined septum	Store in dark Cool 4°C, 0.008% $Na_2S_2O_3$[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% $Na_2S_2O_3$[1]	7 days until extraction; 40 days after extraction
Bis(2-chloroethyl) ether[7]	Glass,Teflon®-lined cap	Cool 4°C 0.008% $Na_2S_2O_3$[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% $Na_2S_2O_3$[1] HCl to pH 2[5]	14 days
Bromoform	Glass,Teflon®-lined septum	Cool 4°C, 0.008% $Na_2S_2O_3$[1] HCl to pH 2[5]	14 days
Bromomethane	Glass,Teflon®-lined septum	Cool 4°C, 0.008% $Na_2S_2O_3$[1] HCl to pH 2[5]	14 days
4-Bromophenylphenyl ether[7]	Glass,Teflon®-lined cap	Cool 4°C, 0.008% $Na_2S_2O_3$[1]	7 days until extraction; 40 days after extraction
Carbon tetrachloride	Glass,Teflon®-lined septum	Cool 4°C, 0.008% $Na_2S_2O_3$[1] HCl to pH 2[5]	14 days
4-Chloro-3-methylphenol[7]	Glass,Teflon®-lined cap	Cool 4°C, 0.008% $Na_2S_2O_3$[1]	7 days until extraction; 40 days after extraction
Chlorobenzene	Glass,Teflon®-lined septum	Cool 4°C, 0.008% $Na_2S_2O_3$[1] HCl to pH 2[5]	14 days

Parameter	Container ("P" means plastic, hard or soft; "G" means glass, hard or soft.)	Preservation	Maximum Holding Time
Chloroethane	Glass,Teflon®-lined septum	Cool 4°C, 0.008% $Na_2S_2O_3$[1] HCl to pH 2[5]	14 days
2-Chloroethylvinyl ether	Glass,Teflon®-lined septum	Cool 4°C, 0.008% $Na_2S_2O_3$[1] HCl to pH 2[5]	14 days
Chloroform	Glass,Teflon®-lined septum	Cool 4°C, 0.008% $Na_2S_2O_3$[1] HCl to pH 2[5]	14 days
Chloromethane	Glass,Teflon®-lined septum	Cool 4°C, 0.008% $Na_2S_2O_3$[1] HCl to pH 2[5]	14 days
2-Chloronaphthalene[7]	Glass,Teflon®-lined cap	Cool 4°C	7 days until extraction; 40 days after extraction
2-Chlorophenol[7]	Glass,Teflon®-lined cap	Cool 4°C, 0.008% $Na_2S_2O_3$[1]	7 days until extraction; 40 days after extraction
4-Chlorophenylphenyl ether[7]	Glass,Teflon®-lined cap	Cool 4°C, 0.008% $Na_2S_2O_3$[1]	7 days until extraction; 40 days after extraction
Chrysene[7]	Glass,Teflon®-lined cap	Cool 4°C, 0.008% $Na_2S_2O_3$[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% $Na_2S_2O_3$[1] Store in dark	7 days until extraction; 40 days after extraction
Dibromochloromethane	Glass,Teflon®-lined septum	Cool 4°C, 0.008% $Na_2S_2O_3$[1] HCl to pH 2[5]	14 days
1,2-Dichloro-benzene[7]	Glass,Teflon®-lined septum	Cool 4°C, 0.008% $Na_2S_2O_3$[1] HCl to pH 2[5]	14 days
1,3-Dichloro-benzene[7]	Glass,Teflon®-lined septum	Cool 4°C, 0.008% $Na_2S_2O_3$[1] HCl to pH 2[5]	14 days
1,4-Dichloro-benzene[7]	Glass,Teflon®-lined septum	Cool 4°C, 0.008% $Na_2S_2O_3$[1] HCl to pH 2[5]	14 days
3,3′-Dichlorobenzidine[7]	Glass,Teflon®-lined septum	Cool 4°C, 0.008% $Na_2S_2O_3$[1]	14 days
Dichlorodifluoromethane	Glass,Teflon®-lined septum	Cool 4°C, 0.008% $Na_2S_2O_3$[1]	14 days
1,1-Dichloroethane	Glass,Teflon®-lined septum	Cool 4°C, 0.008% $Na_2S_2O_3$[1] HCl to pH 2[5]	14 days
1,2-Dichloroethane	Glass,Teflon®-lined septum	Cool 4°C, 0.008% $Na_2S_2O_3$[1] HCl to pH 2[5]	14 days
1,1-Dichloroethene	Glass,Teflon®-lined septum	Cool 4°C, 0.008% $Na_2S_2O_3$[1] HCl to pH 2[5]	14 days
trans-1,2-Dichloroethene	Glass,Teflon®-lined septum	Cool 4°C, 0.008% $Na_2S_2O_3$[1] HCl to pH 2[5]	14 days
2,4-Dichlorophenol[7]	Glass,Teflon®-lined cap	Cool 4°C, 0.008% $Na_2S_2O_3$[1]	7 days until extraction; 40 days after extraction
1,2-Dichloropropane	Glass,Teflon®-lined septum	Cool 4°C, 0.008% $Na_2S_2O_3$[1] HCl to pH 2[5]	14 days
cis-1,3-Dichloropropene	Glass,Teflon®-lined septum	Cool 4°C, 0.008% $Na_2S_2O_3$[1] HCl to pH 2[5]	14 days
trans-1,3-Dichloropropene	Glass,Teflon®-	Cool 4°C,	14 days

Parameter	Container ("P" means plastic, hard or soft; "G" means glass, hard or soft.)	Preservation	Maximum Holding Time
	lined septum	0.008% $Na_2S_2O_3$[1] HCl to pH 2[5]	
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% $Na_2S_2O_3$[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
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% $Na_2S_2O_3$[1]	7 days until extraction; 40 days after extraction
2,4-Dinitrotoluene[7]	Glass,Teflon®-lined cap	Cool 4°C, 0.008% $Na_2S_2O_3$[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% $Na_2S_2O_3$[1] Store in dark	7 days until extraction; 40 days after extraction
Epichlorohydrin	Glass,Teflon®-lined septum	Cool 4°C, 0.008% $Na_2S_2O_3$[1]	14 days
Ethylbenzene	Glass,Teflon®-lined septum	Cool 4°C, 0.008% $Na_2S_2O_3$[1] HCl to pH 2[5]	14 days
Fluoranthene[7]	Glass,Teflon®-lined cap	Cool 4°C, 0.008% $Na_2S_2O_3$[1] Store in dark	7 days until extraction; 40 days after extraction
Fluorene[7]	Glass,Teflon®-lined cap	Cool 4°C, 0.008% $Na_2S_2O_3$[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% $Na_2S_2O_3$[1] Store in dark	7 days until extraction; 40 days after extraction
Isophorone[7]	Glass,Teflon®-lined cap	Cool 4°C, 0.008% $Na_2S_2O_3$[1] Store in dark	7 days until extraction; 40 days after extraction
Methylene chloride	Glass,Teflon®-lined septum	Cool 4°C, 0.008% $Na_2S_2O_3$[1] HCl to pH 2[5]	14 days
2-Methyl-4,6-dinitrophenol[7]	Glass,Teflon®-lined septum	Cool 4°C, 0.008% $Na_2S_2O_3$[1]	7 days until extraction; 40 days after extraction
Naphthalene[7]	Glass,Teflon®-lined cap	Cool 4°C, 0.008% $Na_2S_2O_3$[1] Store in dark	7 days until extraction; 40 days after extraction
Nitrobenzene[7]	Glass,Teflon®-lined cap	Cool 4°C, 0.008% $Na_2S_2O_3$[1] Store in dark	7 days until extraction; 40 days after extraction
2-Nitrophenol[7]	Glass,Teflon®-lined cap	Cool 4°C, 0.008% $Na_2S_2O_3$[1]	7 days until extraction; 40 days after extraction
4-Nitrophenol[7]	Glass,Teflon®-lined cap	Cool 4°C, 0.008% $Na_2S_2O_3$[1]	7 days until extraction; 40 days after extraction
N-Nitrosodimethylamine[7, 10]	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
	lined cap	0.008% $Na_2S_2O_3$[1] Store in dark	40 days after extraction
N-Nitrosodi-n-propylamine[7, 10]	Glass,Teflon®-lined cap	Cool 4°C, 0.008% $Na_2S_2O_3$[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% $Na_2S_2O_3$[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% $Na_2S_2O_3$[1]	7 days until extraction; 40 days after extraction
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% $Na_2S_2O_3$[1]	7 days until extraction; 40 days after extraction
Phenanthrene[7]	Glass,Teflon®-lined cap	Cool 4°C, 0.008% $Na_2S_2O_3$[1] Store in dark	7 days until extraction; 40 days after extraction
Phenol[7]	Glass,Teflon®-lined cap	Cool 4°C, 0.008% $Na_2S_2O_3$[1] Store in dark	7 days until extraction; 40 days after extraction
Pyrene[7]	Glass,Teflon®-lined cap	Cool 4°C, 0.008% $Na_2S_2O_3$[1] Store in dark	
2,3,7,8-Tetrachlorodibenzo-p-dioxin[7]	Glass,Teflon®-lined cap	Cool 4°C, 0.008% $Na_2S_2O_3$[1]	7 days until extraction; 40 days after extraction
1,1,2,2-Tetrachloroethane	Glass,Teflon®-lined septum	Cool 4°C, 0.008% $Na_2S_2O_3$[1] HCl to pH 2[5]	14 days
Tetrachloroethene	Glass,Teflon®-lined septum	Cool 4°C, 0.008% $Na_2S_2O_3$[1] HCl to pH 2[5]	14 days
Toluene	Glass,Teflon®-lined septum	Cool 4°C, 0.008% $Na_2S_2O_3$[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% $Na_2S_2O_3$[1] HCl to pH 2[5]	14 days
1,1,2-Trichloroethane	Glass,Teflon®-lined septum	Cool 4°C, 0.008% $Na_2S_2O_3$[1] HCl to pH 2[5]	14 days
Trichloroethene	Glass,Teflon®-lined septum	Cool 4°C, 0.008% $Na_2S_2O_3$[1] HCl to pH 2[5]	14 days
Trichlorofluoromethane	Glass,Teflon®-lined septum	Cool 4°C, 0.008% $Na_2S_2O_3$[1] HCl to pH 2[5]	14 days
2,4,6-Trichlorophenol[7]	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
	lined cap	0.008% $Na_2S_2O_3$[1]	40 days after extraction
Vinyl chloride	Glass,Teflon®-lined septum	Cool 4°C, 0.008% $Na_2S_2O_3$[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®-lined cap	Cool 4°C, pH 5-9[10]	7 days until extraction; 40 days after extraction
Atraton	Glass,Teflon®-lined cap	Cool 4°C, pH 5-9[10]	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
Chloropropham	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

Parameter	Container ("P" means plastic, hard or soft; "G" means glass, hard or soft.)	Preservation	Maximum Holding Time
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
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®-	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
	lined cap	pH 5-9[10]	40 days after extraction
Propoxur	Glass,Teflon®-	Cool 4°C,	7 days until extraction;
	lined cap	pH 5-9[10]	40 days after extraction
Secbumeton	Glass,Teflon®-	Cool 4°C,	7 days until extraction;
	lined cap	pH 5-9[10]	40 days after extraction
Siduron	Glass,Teflon®-	Cool 4°C,	7 days until extraction;
	lined cap	pH 5-9[10]	40 days after extraction
Simazine	Glass,Teflon®-	Cool 4°C,	7 days until extraction;
	lined cap	pH 5-9[10]	40 days after extraction
Strobane	Glass,Teflon®-	Cool 4°C,	7 days until extraction;
	lined cap	pH 5-9[10]	40 days after extraction
Swep	Glass,Teflon®-	Cool 4°C,	7 days until extraction;
	lined cap	pH 5-9[10]	40 days after extraction
2,4,5-T	Glass,Teflon®-	Cool 4°C,	7 days until extraction;
	lined cap	pH 5-9[10]	40 days after extraction
2,4,5-TP (Silvex)	Glass,Teflon®-	Cool 4°C,	7 days until extraction;
	lined cap	pH 5-9[10]	40 days after extraction
Terbuthylazine	Glass,Teflon®-	Cool 4°C,	7 days until extraction;
	lined cap	pH 5-9[10]	40 days after extraction
Toxaphene	Glass,Teflon®-	Cool 4°C,	7 days until extraction;
	lined cap	pH 5-9[10]	40 days after extraction
Trifluralin	Glass,Teflon®-	Cool 4°C,	7 days until extraction;
	lined cap	pH 5-9[10]	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 $Na_2S_2O_3$, 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 $Na_2S_2O_3$ 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 $Na_2S_2O_3$.

(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 holding 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 l6 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

Parameter	Preservation	Container ("P" means plastic, hard or soft; "G" means glass, hard or soft.)	Instrumentation
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 l6 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

Parameter	Preservation	Container ("P" means plastic, hard or soft; "G" means glass, hard or soft.)	Maximum Holding Time
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

Parameter	Preservation	Container ("P" means plastic, hard or soft; "G" means glass, hard or soft.)	Maximum Holding Time
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)

Parameter	Container	Preservation	Maximum Holding Time
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 $Na_2S_2O_3$ 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 HNO_3 to pH < 2	6 months
Metals except Cr VI and Hg (suspended) for liquid samples	P, G	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% $Na_2S_2O_3$ 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_2SO_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

Parameter	Sample Container	Preservation	Maximum Holding Time
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% $Na_2S_2O_3$	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

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

ii. If the facility discharges continuously but the effluent cannot be pumped directly and continuously to the dilutor system, then the following procedures shall be used:

(1) Twenty-four hour composite samples consisting either of equal volumes taken once every hour, or flow-proportionate composite sampling shall be collected and transported to the dilutor daily for the duration of the test. Any surplus from the previous sample is to be discarded and the holding container refilled with fresh effluent sample.

iii. If the facility discharges intermittently, one of the following procedures shall be used:

(1) When the effluent is discharged continuously only during a single work shift, or two successive work shifts, at least one composite sample of sufficient volume to supply the dilutor for 24 hours shall be collected daily during a single discharge period for the duration of the test;

(2) When the facility retains the wastewater during a work shift, then treats and releases it in a batch discharge, a single grab sample of sufficient volume to supply the dilutor for the intervening hours shall be collected and stored in accordance with (b)10 below; and

(3) When the facility discharges wastewater to an estuary during an outgoing tide, a single grab sample or composite sample (as specified by the Department in the NJPDES permit), of sufficient volume to set up the toxicity test shall be collected on the outgoing tide. This procedure is repeated for the duration of flow-through toxicity tests.

4. In order to insure the collection of a representative effluent sample for a static or renewal toxicity test, the following sampling procedures shall be followed:

i. If a static toxicity test is to be conducted, effluent samples shall be collected only at the beginning of the test. If a renewal toxicity test is to be conducted, then effluent samples shall be collected at the beginning of the test and the test solutions renewed at least daily throughout the duration of the test. Sampling for these renewal solutions shall comply with the procedures specified in (b)4ii and iii below, and in (b)5 below;

ii. If the facility discharges wastewater continuously the following procedures shall be used:

(1) Twenty-four hour composite samples consisting of equal volumes collected at least once every hour or a flow proportionate 24 hour composite sample shall be collected and used to set up a single toxicity test. This procedure is repeated for the duration of renewal toxicity tests.

iii. If the facility discharges wastewater intermittently one of the following procedures shall be used:

(1) When the effluent is discharged continuously only during a single work shift, or two successive work shifts, at least one composite sample, of sufficient volume to set up the toxicity test, shall be collected. This procedure is repeated for the duration of renewal toxicity test;

(2) When a facility retains the wastewater during a work shift, then treats and releases it in a batch discharge, a grab sample shall be collected during the discharge period. Sufficient volume of sample shall be collected for the set up and renewal of the toxicity test during the hours intervening between effluent discharges. Effluent samples shall be collected and stored in accordance with (b)10 below; and

(3) When the facility discharges wastewater to an estuary only during an outgoing tide, a single grab sample or composite sample (as specified by the Department in the NJPDES permit), of sufficient volume to set up the toxicity test shall be collected on the outgoing tide. This procedure is repeated for the duration of renewal toxicity tests.

5. When the effluent to be sampled is a stormwater discharge, the following sampling procedures shall be used for static, renewal, and flow through toxicity tests:

i. The stormwater discharge shall be a grab or composite sample either directly from the discharge pipe during the precipitation event or from the retention pond during or immediately after the precipitation event unless otherwise specified by the Department in the NJPDES permit; and

ii. Sufficient sample shall be collected during runoff from a precipitation event on the first day of sampling to provide either for the set up and renewal, where applicable, or the static or renewal toxicity test over its duration, or for the uninterrupted operation of the dilutor system over the duration of the flow through toxicity test. Samples shall be collected in this manner for each day the discharge persists during the test period. Test sample renewal shall be conducted with the newest sample available during the test period. Stormwater samples not used immediately shall be stored in approved containers as specified in N.J.A.C. 7:18–7.3(a)14, and preserved at 1.0 to 4.4 degrees Celsius. Samples shall not be stored for longer than 120 hours prior to use.

6. Alteration of effluent samples shall be limited to:

i. Filtration through screening having a mesh of two mm or larger;

ii. Introduction of dry artificial sea salts or a hypersaline brine for the purpose of adjusting the effluent test concentration salinity according to the procedures specified in N.J.A.C. 7:18–7.5(*o*);

iii. A laboratory may adjust an effluent sample using a dechlorinating agent to reduce the level of chlorine in an effluent sample. Since anhydrous sodium thiosulfate and other dechlorinating agents may contribute to sample toxicity, the laboratory shall include

an additional control containing the dechlorinating agent in the acute toxicity test, in addition to the control chambers specified in N.J.A.C. 7:18–7.5(b)5. The amount of dechlorinating agent in the control shall be equal to that contained in the highest effluent concentration tested. The laboratory shall document and report adjustments and treatments of the effluent along with the test results. The laboratory shall include in the documentation the type and amount of dechlorinating agent which is added and the chlorine levels before and after dechlorination.

7. Composite or grab sample collection and handling containers shall meet the requirements listed in N.J.A.C. 7:18–7.3(a)14. Prior to sample collection, containers shall either be rinsed with the effluent or laboratory pure water, as specified in N.J.A.C. 7:18–7.4(a), and then filled so that there should be no air space in either the neck or the top of the container;

8. Effluent samples shall be stored in covered, sealed, containers constructed on non-toxic materials as specified in N.J.A.C. 7:18–7.3(a)14;

9. Unless the purpose of the toxicity test is to ascertain the persistence of the toxic materials in an effluent, testing shall begin within 24 hours of the collection of an effluent. For storm water discharge, the toxicity tests shall begin within 48 hours of collection conducted in accordance with (b)5 above; and

10. Samples that are collected for offsite testing, and the testing will be initiated two or more hours after collection, shall be iced after collection and kept chilled between 1.0 and 4.4 degrees Celsius in the laboratory until adjustment to the test temperature prior to initiating the test. Composite samples shall be kept chilled between 1.0 and 4.4 degrees Celsius for the duration of sampling.

(c) The following chain-of-custody procedures shall be followed for effluent and dilution water for all composite and grab samples in acute toxicity testing.

1. Only clean or new containers, as specified in N.J.A.C. 7:18–7.3(a)13 and 14, previously rinsed with either laboratory pure water or the material being sampled, shall be used for taking composite or grab samples;

2. Labels with an identification number shall be affixed to all samples;

3. After a sample has been collected, the appropriate information as to identity of the sample shall be written on the label and the label affixed. The label shall remain affixed until the test has begun and the surplus sample has been discarded;

4. Immediately upon delivery of a sample to the certified environmental laboratory, the sample collector shall complete the appropriate chain-of-custody section of the sample report form or chain-of-custody form;

5. The chain-of-custody form shall list at a minimum the following information:

i. The sample number;

ii. The description of samples;

iii. The specific location of sample collection;

iv. The identity of the person collecting the sample;

v. The date and time of sample collection;

vi. The date and time of custody transfer to laboratory (if the sample was collected by a person other than laboratory personnel);

vii. The identity of the person accepting custody (if the sample was collected by a person other than laboratory personnel);

viii. The date and time of initiation of analyses;

ix. The identity of the person performing analysis; and

x. The name and identification number of environmental laboratory performing the analyses; and

6. The laboratory personnel accepting responsibility for the sample, as well as all other laboratory personnel performing the analysis on that sample, shall sign the form containing the chain-of-custody information.

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

SUBCHAPTER 10. CIVIL ADMINISTRATIVE PENALTIES AND ADMINISTRATIVE ORDERS

7:18–10.1 Purpose

(a) This subchapter establishes procedures governing the following, in connection with violations of any provision of this chapter or any provision of an order issued pursuant to this chapter:

1. The assessment of civil administrative penalties; and

2. The issuance of civil administrative orders.

7:18–10.2 Administrative orders

(a) Except as provided in (c) below, the Department may issue an administrative order against any certified environmental laboratory or other person who has violated any provision of this chapter, or any provision of an order issued pursuant to this chapter, for one or more of the following purposes:

1. To direct the laboratory or other person to comply with a provision of this chapter or of an order issued pursuant to this chapter;