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ENVIRONMENTAL PROTECTION

WATER RESOURCE MANAGEMENT

WATER MONITORING AND STANDARDS

WATER QUALITY

Surface Water Quality Standards; New Jersey Pollutant Discharge Elimination System

Proposed Amendments: N.J.A.C. 7:9B-1.1, 1.4, 1.5 and 1.14; and 7:14A-11.7

Proposed New Rule: N.J.A.C. 7:9B-1.16

Authorized By: Shawn M. LaTourette, Commissioner, Department of Environmental Protection.

Authority: N.J.S.A. 13:1D-1 et seq., 58:10A-1 et seq., and 58:11A-1 et seq.

Calendar Reference: See Summary below for explanation of exception to calendar requirement.

DEP Docket Number: 5-22-5.

Proposal Number: PRN 2022-088.

A public hearing concerning this notice of proposal will be held on August 3, 2022, at 10:00 A.M. The hearing will be conducted virtually through the Department of Environmental Protection (Department's) video conferencing software, Microsoft Teams. A link to the virtual public hearing will be provided on the Surface Water Quality Standards website.

Submit comments by September 3, 2022, electronically at www.nj.gov/dep/rules/comments. Each comment should be identified by the applicable N.J.A.C. citation, with the commenter's name and affiliation following the comment.

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The Department encourages electronic submittal of comments. In the alternative, comments may be submitted on paper to:

Melissa P. Abatemarco, Esq.

Attn.: DEP Docket No. 5-22-5

Office of Legal Affairs

Department of Environmental Protection

401 East State Street, 7th Floor

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PO Box 402

Trenton, New Jersey 08625-0402

If you are interested in providing oral testimony or submitting written comments at the virtual public hearing, please email the Department at swqs@dep.nj.gov no later than 5:00 P.M. on August 1, 2022, with your contact information (name, organization, telephone number, and email address). You must provide a valid email address, so the Department can send you an email confirming receipt of your interest to testify orally at the hearing and provide you with a separate option for a telephone call-in line if you do not have access to a computer that can connect to Microsoft Teams. Please note that the Department will take oral testimony at the hearing in alphabetical order of the testifying person's last name. Further, this hearing will be recorded. It is requested (but not required) that anyone providing oral testimony at the public hearing provide a copy of any prepared remarks to the Department through email.

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The rule proposal may be viewed or downloaded from the Department's website at <http://www.nj.gov/dep/rules>.

The agency proposal follows:

Summary

As the Department has provided a 60-day comment period on this notice of proposal, this notice is excepted from the rulemaking calendar requirement pursuant to N.J.A.C. 1:30-3.3(a)5.

The Department is proposing amendments to the Surface Water Quality Standards (SWQS) at N.J.A.C. 7:9B to revise the bacterial quality criteria for primary contact recreation at N.J.A.C. 7:9B-1.14(d)1 and the freshwater ammonia criteria at N.J.A.C. 7:9B-1.14(e) based on the recommendations of the U.S. Environmental Protection Agency (USEPA). The Department is also adding new N.J.A.C. 7:9B-1.16 to establish provisions for the development, adoption, and implementation of water quality standards (WQS) variances. In addition, the Department is proposing changes to the total phosphorus criteria at N.J.A.C. 7:9B-1.14(d)4 to be consistent with the Department's nutrient policies at N.J.A.C. 7:9B-1.5(g)2.

The Department's SWQS at N.J.A.C. 7:9B include policies, surface water classifications, and surface water quality criteria necessary to protect the quality of New Jersey's surface waters. New Jersey's surface waters are classified based on the type of waterbody and the designated use of the waterbody. The two types of surface waters in the State are fresh and saline waters. Freshwaters are classified as FW1 and FW2. FW1 waters are waters maintained in their natural

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water quality state because of their clarity, color, scenic setting, other characteristic of aesthetic value, unique ecological significance, exceptional recreational significance, or exceptional water supply significance, and they are not subject to any man-made wastewater discharges.

FW2 waters are all other freshwaters except for waters within the Pinelands Protection and Preservation areas that are classified as Pinelands waters “PL.” FW2 waters are further classified based on their ability to support trout, which thrive in cooler stream temperatures. These classifications include trout production (FW2-TP), trout maintenance (FW2-TM), and nontrout (FW2-NT).

Saline waters are classified as saline estuarine “SE” and saline coastal “SC.” SE waters are further classified as “SE1,” “SE2,” and “SE3” waters based on their ability to support recreation, shellfish harvesting, and warm water fish species.

Designated uses include public potable water supply after conventional treatment; recreation; fish consumption; shellfish harvesting; maintenance, migration, and propagation of fish; agricultural and industrial water supplies; and any other reasonable uses.

The SWQS at N.J.A.C. 7:9B-1.14 establish the water quality criteria that must be attained to support the existing and designated uses applicable to each surface water classification. Surface water quality criteria are numeric or narrative descriptions of the quality of water that will support existing and designated uses for each surface water classification. Numeric criteria establish concentration thresholds of chemicals, such as toxic pollutants and other parameters, such as pH and temperature.

The Department utilizes the SWQS to develop water quality-based effluent limitations (WQBELs) in its New Jersey Pollutant Discharge Elimination System (NJPDDES) rules, N.J.A.C.

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7:14A, to protect or improve the existing water quality and designated uses. The Department also utilizes the SWQS to establish certain permit requirements in its Freshwater Wetlands rules, N.J.A.C. 7:7A, Coastal Permitting rules, N.J.A.C. 7:7E, and Flood Hazard Area Control Act rules, N.J.A.C. 7:13.

In preparation for this rulemaking, the Department held several stakeholder meetings starting in 2015 through 2019. Stakeholders represented all sectors, including environmental, professional and trade groups, industry, permittees, local, regional, State and Federal government organizations, and consulting groups. The Department posted invitations, agendas, presentations, and supporting documents for the stakeholder meetings at <https://www.nj.gov/dep/workgroups/>.

Bacterial Quality Criteria

The Department proposes to amend the bacterial quality criteria at N.J.A.C. 7:9B-1.14(d)1ii, based on the USEPA's 2012 Recreational Water Quality Criteria (RWQC) (USEPA, 2012). Pursuant to the proposed amendments, the Department would use a geometric mean and Statistical Threshold Value (STV) for fresh and saline waters designated for primary contact recreation. Additionally, the Department is revising the duration for sample collection and analysis from 30 to 90 days, over which the geometric mean and STV are calculated. As discussed further below, the STV approximates the 90th percentile of the water quality distribution and is intended to be a value that should not be exceeded by more than 10 percent of the samples taken.

Scientific Basis of Criteria Development

The Department is retaining the bacterial indicators for fresh waters as *Escherichia coli* (*E. coli*) and enterococci for saline waters. In 1986, the USEPA determined that the agent most

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responsible for causing gastrointestinal illnesses is human fecal waste. Based on epidemiological studies conducted at the time, the 1986 and the 2012 USEPA recommendations specified that *E. coli* and enterococcus are equally valid as indicators of health risk in fresh bathing waters, and enterococci are valid indicators of health risk in saline waters (USEPA, 1986; USEPA, 2012). In 2006, the Department adopted the *E. coli* criteria for fresh waters and retained the criteria for enterococcus in saline waters at N.J.A.C. 7:9B-1.14(d)ii (see 38 N.J.R. 4449(a)).

The USEPA's revised RWQC for *E. coli* and enterococcus are based on the National Epidemiological and Environmental Assessment of Recreational Water (NEEAR) studies (NEEAR, 2009), which define gastrointestinal illness as "any of the following [within 10 to 12 days after swimming]: (a) diarrhea (three or more loose stools in a 24-hour period), (b) vomiting, (c) nausea and stomachache, or (d) nausea or stomachache and impact on daily activity." The definition of illness is a critical factor in determining the number of illnesses that are used to derive the criteria. The Department's current bacteria criteria at N.J.A.C. 7:9B-1.14 are based on the USEPA's 1986 criteria recommendations (USEPA, 1986). The definition of illness in NEEAR (2009) is different from the definition in the 1986 criteria recommendations, which correspond to a level of water quality associated with an estimated illness rate that is expressed in terms of the number of highly credible gastrointestinal illnesses (HCGI). The HCGI was defined as "any one of the following unmistakable or combinations of symptoms within eight to ten days of swimming: (1) vomiting, (2) diarrhea with fever or a disabling condition (remained home, remained in bed or sought medical advice because of symptoms), (3) stomachache or nausea accompanied by a fever" (USEPA, 1986). In the 2012 USEPA recommendation, the definition of gastrointestinal illness omitted fever as a symptom in order to account for viral gastrointestinal illnesses, which do

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not always present with a fever. Thus, because the Department's current illness rate of 19 illnesses per 1,000 individuals (see Table 1 and 2 below) is based on the USEPA's 1986 definition, the current illness rate cannot be compared against the 2012 USEPA recommended illness rate of 32 and 36 illnesses per 1,000 individuals, which is based on a new definition of gastrointestinal illness. The proposed use of the 2012 criteria is more protective..

USEPA 2012 RWQC Recommendations

The USEPA 2012 RWQC recommends that states make a risk management decision regarding illness rate to protect human health based on one of two options. The first option provides criteria thresholds calculated based on 36 illnesses per 1,000 people. The second option provides criteria thresholds calculated based on 32 illnesses per 1,000 people (see Table 1 and 2 below). The USEPA recommends that states adopt the option that is appropriate for the state, and that states select a geometric mean and statistical threshold value consistent with the chosen option for both fecal indicator bacteria (FIB), enterococcus for saline waters, and *E. coli* for freshwaters. FIB in surface waters are used as indicators of fecal contamination. They are commonly found in human and animal feces, and although they are not generally harmful themselves, they indicate a possible presence of disease-causing bacteria, potential contamination from sewage, and an increased health risk of encountering human pathogens (see <https://archive.epa.gov/water/archive/web/html/vms511.html>).

The USEPA recommends that states establish magnitude, duration, and frequency when developing a water quality criterion and requires all three components to be included upon promulgation.

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Magnitude is the numeric expression of the maximum amount of the pollutant that may be present in a waterbody while supporting the designated use. In the 2012 RWQC, the USEPA expresses the magnitude of the FIB as both a geometric mean and a statistical threshold value for the bacteria samples. The statistical threshold value is a new measure, which the USEPA defines as “the value that approximates the 90th percentile of the water quality distribution and is intended to be a value that should not be exceeded by more than 10 percent of the samples used to calculate the geometric mean for the purposes of bacterial quality criteria specified.”

Duration is the length of time over which the magnitude is calculated. The USEPA recommends a duration of either 30 or 90 days in a communication from the USEPA’s Standards and Health Protection Division to the Water Quality Standards Coordinators: Narrative Justification for Longer Duration Period for Recreational Water Quality Criteria (distributed to states by USEPA, October 30, 2015).

Frequency of excursion describes the maximum number of times the pollutant may be present above the magnitude during the specified duration. The excursion frequency recommended by the USEPA in the 2012 RWQC is not to be greater than 10 percent of the statistical threshold value magnitude in the same 30- or 90-day interval.

Existing Criteria and Proposed Amendments (N.J.A.C. 7:9B-1.14(d)1ii)

The bacterial quality criteria in the Department’s SWQS are applicable to three different uses: shellfish harvesting (Shellfish Waters), primary contact recreation waters (fresh water two [FW2], saline estuarine one [SE1], and saline coastal [SC] water classifications), and secondary contact recreation saline waters (SE2 and SE3 water classifications). The SE2 and SE3 water

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classifications are not designated for primary contact recreation, which is defined in the SWQS at N.J.A.C. 7:9B-1.4 as water-related recreational activities that involve significant ingestion risks and includes, but is not limited to, wading, swimming, diving, surfing, and water skiing. The USEPA does not have criteria recommendations for waters designated for secondary contact recreation, which is defined in the SWQS as recreational activities where the probability of water ingestion is minimal and includes, but is not limited to, boating and fishing. In New Jersey, most of the waters designated as SE2 and SE3 are located in the New York-New Jersey Harbor Estuary. The Department is retaining the fecal coliform criteria for secondary contact recreation in these waters until bacteria criteria recommendations for secondary contact recreation based on the latest science are available, and the highest attainable use of the downgraded water are determined. However, the Department continues to monitor the NY-NJ Harbor estuary waters to determine the highest attainable use in these waters.

The Department is proposing amendments to the existing bacteria quality criteria at N.J.A.C. 7:9B-1.14(d)1ii for primary contact recreation using the USEPA's second option, as described above, which bases criteria on 32 illnesses per 1,000 people and is more protective of human health. The USEPA options, New Jersey's existing criteria, and proposed amendments to enterococci (SE1 and SC waters) and *E. coli* (FW2 waters) criteria are summarized in Table 1 and 2 below.

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Table 1. Comparison of NJ and USEPA Recreational Criteria for Enterococcus
Saline Waters (Estuarine and Coastal Waters)

| <i>Enterococcus</i> | NJ Current 19 illness/1,000 individuals | USEPA Option 1 36 illness/1,000 individuals | USEPA Option 2 32 illness/1,000 individuals | NJ Proposed (SE1 & SC) |
|--------------------------------|--|--|--|---|
| Geometric mean | 35 cfu*/100 ml | 35 cfu/100 ml | 30 cfu/100 ml | 30 cfu/100 ml |
| Single sample maximum | 104 cfu/100 ml | N/A | N/A | N/A |
| Statistical threshold value | N/A | 130 cfu/100 ml | 110 cfu/100 ml | 110 cfu/100 ml |
| No. of Samples | Minimum 5 in 30 days | Not specified | Not specified | Not specified |
| Averaging period | 30 days | 30 or 90 days | 30 or 90 days | 90 days |
| Applicability | Annual | Annual | Annual | Annual |

*cfu – colony-forming units

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Table 2. Comparison of NJ and USEPA Recreational Criteria for *E. coli*
Freshwaters (Rivers, Streams, and Lakes)

| <i>E. coli</i> | NJ Current 8 illness/1,000 individuals | USEPA Option 1 36 illness/1,000 individuals | USEPA Option 2 32 illness/1,000 individuals | NJ Proposed (All FW2) |
|--------------------------------|---|--|--|--------------------------------------|
| Geometric mean | 126 cfu*/100 ml | 126 cfu/100 ml | 100 cfu/100 ml | 100 cfu/100 ml |
| Single sample maximum | 235 cfu/100 ml | N/A | N/A | N/A |
| Statistical threshold value | N/A | 410 cfu/100 ml | 320 cfu/100 ml | 320 cfu/100 ml |
| Sampling frequency | Minimum 5 in 30 days | Not specified | Not specified | Not specified |
| Averaging period | 30 days | 30 or 90 days | 30 or 90 days | 90 days |
| Applicability | Annual | Annual | Annual | Annual |

*cfu – colony-forming units

As presented in Table 1 and 2 above, for the enterococci criteria under primary contact recreation in SE1 and SC waters, the Department is proposing to replace the geometric mean of 35 colony-forming units (cfu)/100 milliliters (ml) with 30 cfu/100 ml, and the single sample maximum of 104 cfu/100 ml with the statistical threshold value of 110 cfu/100 ml, which shall not be greater than the 10 percent excursion frequency over a 90-day period, in accordance with the

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USEPA's second option. For the *E. coli* criteria under primary contact recreation for FW2 waters, the Department is proposing to replace the geometric mean of 126 cfu/100 ml with 100 cfu/100 ml, and the single sample maximum of 235 cfu/100 ml with the statistical threshold value of 320 cfu/100 ml, which shall not be greater than the 10 percent excursion frequency over a 90-day period.

The Department is proposing to change the current duration of 30 days to 90 days, which it has determined to be an acceptable critical exposure period to protect recreational uses for the following reasons. First, the epidemiological studies conducted by NEEAR to develop the 2012 illness rates for *E. coli* and enterococcus utilized an exposure period of 90 days. Second, an analysis of data from waters that experience short-term variability, or "transient fluctuations," from periodic high concentration releases exhibit very similar criteria attainment assessment outcomes using either a 30-day or 90-day assessment period, when both the geometric mean and statistical threshold value criteria components are evaluated. Third, the Department would be able to collect data from more waterbodies in 90 days, which will increase the confidence in the assessment results. Thus, the Department is proposing a 90-day averaging period for both fresh and saline waters. The Department would apply the 90-day duration in developing the biennial Integrated Water Quality Assessment Report (Integrated Report) that describes the health of New Jersey's waters, as required at Sections 303(d) and 305(b) of the Federal Water Pollution Control Act, also known as the Clean Water Act (Federal Act).

The Department is proposing to delete the existing policy of requiring at least five samples in 30 days at N.J.A.C. 7:9B-1.5(c)7 for waters designated for primary contact recreation. If the proposed primary contact recreational criteria are adopted, the Department would update sampling

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frequency and assessment methods in the Department's Integrated Monitoring and Assessment Methods (Methods Document) at https://www.nj.gov/dep/wms/bears/assessment.htm#.

Additionally, the Department is proposing to clarify the existing language at N.J.A.C. 7:9B-1.5(c)7 to indicate that beach notifications are issued in accordance with the New Jersey Department of Health's Public Recreational Bathing rules at N.J.A.C. 8:26.

As stated above, the Department is proposing geometric mean and STVs for fresh and saline waters and revising the duration from 30 to 90 days. These proposed changes are to be implemented through the NJPDES rules at N.J.A.C. 7:14A. While the Department is proposing a 90-day duration for bacterial quality criteria, the NJPDES rules require that NJPDES permit limits for pollutants discharged from a domestic treatment works shall be stated as average weekly and average monthly discharge limitations. This is consistent with the USEPA's implementation approach. Also, the USEPA's Permit Compliance System and Integrated Compliance Information System databases are currently designed to accept weekly and monthly average data values where only one weekly average and monthly average value can be specified for each month in the Discharge Monitoring Report (DMR). In contrast, the STV and geometric mean will be calculated for each reporting period using daily data points from the preceding 30 days, and not from a weekly or monthly average value, and the number of samples will vary depending upon the dataset submitted as an attachment. As a result, the only feasible way to report data generated on a 90-day basis will be as an attachment to the monitoring report form. The Department will require the permittees to begin reporting the data as an attachment to the DMRs upon permit renewal and new applications will automatically include this requirement.

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Accordingly, the Department is proposing a new provision to incorporate these changes, at N.J.A.C. 7:9B-1.5(c)8, that the geometric mean (for waters designated for both primary and secondary contact recreation) and statistical threshold value (for waters designated for primary contact recreation), specified at N.J.A.C. 7:9B-1.14(d)1ii and iii, respectively, would be implemented over a 90-day period in the NJPDES permits in accordance with N.J.A.C. 7:14A-13.15(a)2. The NJPDES program currently applies the bacterial criteria utilizing a 30-day geometric mean consistent with the current SWQS, which is also consistent with N.J.A.C. 7:14A-12.5, which specifies use of a 30-day geometric mean, as well as a weekly average. However, if adopted, the NJPDES program would incorporate into affected NJPDES permits, a geometric mean over a 90-day duration, which would be calculated as a rolling geometric mean over three months. As stated previously, the STV approximates the 90th percentile of the water quality distribution and is intended to be a value that should not be exceeded by more than 10 percent of the samples. Permit limits that will be applied as a 90-day duration consistent with this rule will be in addition to the existing permit requirements as applied as a 30-day geometric mean that are consistent with the current SWQS at N.J.A.C. 7:9B-1.14(d)1ii and 1.5(h)5i. The Department will be retaining pathogen limits as a 30-day geometric mean as an added measure since use of a monthly geometric mean is consistent with the statistical basis as included in the NJPDES regulations at N.J.A.C. 7:14A-12.5 and also because the mandatory penalties at N.J.A.C. 7:14 are based on monthly average reported values.

To implement statistical threshold values, the Department will evaluate the 90-day maximum contained in NJPDES permittees' Discharge Monitoring Reports (DMR) for exceedances of the statistical threshold value during the reporting period. If any exceedances are

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present, permittees will have to provide individual sampling data to the Department, so that it can be determined if 10 percent of effluent quality samples exceeded the applicable statistical threshold value. The Department may take appropriate enforcement action if this additional information confirms that the statistical threshold value was exceeded. Enforcement of the geometric mean for bacterial quality criteria is unchanged from the existing protocol. The proposed statistical threshold value provisions require that no more than 10 percent of effluent quality samples from a permittee's reporting period may exceed the applicable statistical threshold value. As an example, for permittees with 10 or fewer samples within a 90-day reporting period, this means the statistical threshold value will essentially act as a single sample maximum threshold. Therefore, one sample exceeding the statistical threshold value would constitute a violation of the statistical threshold value for that reporting period.

Freshwater Ammonia Criteria

The Department is proposing to update the freshwater ammonia criteria at N.J.A.C. 7:9B-1.14(e) based on the USEPA's 2013 Aquatic Life Ambient Water Quality Criteria for Ammonia – Freshwater (USEPA, 2013).

In USEPA (2013), the USEPA recommends acute and chronic ammonia criteria, of which each criterion must include a magnitude, duration, and frequency. The recommended duration for the acute criterion is expressed as a one-hour average, and the chronic criterion's duration is expressed as a 30-day averaging period. In addition, the recommended frequency that is the highest four-day average within the 30-day period should not exceed 2.5 times the chronic criterion magnitude more than once in three years, on average. As explained further below, the acute

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ammonia criteria represent a one-hour average value that should not be exceeded more than once every three years in order to prevent doses that incur immediate detrimental effects on aquatic life. Chronic criteria values represent a 30-day average value not to be exceeded more than once every three years in order to prevent long-term detrimental effects to aquatic life. Accordingly, the Department is proposing to amend the existing freshwater ammonia criteria magnitude and duration, as presented in Table 3 below.

Background

Ammonia is one of several forms of nitrogen that exists in aquatic environments and causes direct toxic effects on aquatic life. Ammonia can enter the aquatic environment through direct means, such as treated wastewater effluent discharges, and the excretion of nitrogenous wastes from animals, as well as indirect means, such as nitrogen fixation, air deposition, and runoff from agricultural lands. High levels of ammonia in ambient water could make it difficult for aquatic organisms to sufficiently excrete the toxicant, leading to toxic build-up in internal tissues and blood, and potentially death. Environmental factors, such as pH and temperature, can affect ammonia toxicity to aquatic animals because ammonia toxicity increases in warmer and more acidic (lower pH) waters.

In addition, toxicity varies based on the duration (short-term or long-term) that the aquatic animals are exposed to ammonia. The effects of ammonia toxicity can be acute or chronic. Acute toxicity means a lethal or severe adverse sublethal effect (for example, immobilization of daphnids) to an organism exposed to a toxic substance for a relatively short period of time. Acute toxicity is measured by short-term bioassays, generally of a 48- or 96-hour duration. Chronic toxicity refers to death or other adverse impacts that affect the growth, survival, or reproductive

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success of an organism, or its progeny, after a relatively long exposure period to toxic substances.

Chronic toxicity is measured using intermediate-term (one to two hours after exposure) or long-term (48 or more hours after exposure) bioassays.

2013 USEPA Recommendations

The USEPA 2013 freshwater ammonia criteria are expressed in three components: magnitude, duration, and frequency.

The magnitudes of the ammonia criteria are determined using temperature and pH dependent formulas. The USEPA 2013 acute and chronic freshwater ammonia criteria were derived using the USEPA's 1985 Guidelines for Deriving Numeric National Water Quality Criteria for the Protection of Aquatic Organisms and their Uses (1985 Guidelines) (USEPA, 1985A). The 1985 Guidelines require toxicological data from a minimum of eight different families or genera, such that toxicity data from both invertebrates and vertebrates are used in the development of acute and chronic criteria.

The USEPA 2013 ammonia criteria were developed using the latest freshwater ammonia toxicity information, including toxicity studies for sensitive unionid mussels and gill-breathing snails. The 2013 ammonia criteria are based on acute toxicity data for 69 genera, and chronic toxicity data for 16 genera. The acute criteria dataset includes 12 species that are Federally listed as threatened, endangered, or species of concern. In the chronic criteria dataset, three salmonid fish species are Federally listed, including sockeye salmon, rainbow trout, and cutthroat trout. The USEPA 2013 ammonia criteria are year-round criteria and the same criteria apply to both trout and non-trout waters.

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The 2013 USEPA recommendations include duration and frequency for both acute and chronic criteria. For acute and chronic criteria, the USEPA recommends a duration of a one-hour average and 30-day rolling average of the magnitude, respectively. In addition, the USEPA recommends that the four-day highest average within the 30 days should not be greater than 2.5 times the chronic criterion for the 2013 ammonia criteria. The Department is proposing to include these USEPA recommendations for total ammonia criteria averaging durations as presented in Table 3 below. For frequency, the USEPA allows one exceedance in three years on an average.

In USEPA (2013), the USEPA indicates that many states have freshwater unionid mussel fauna in some of their waters. Approximately one-fourth of the 300 freshwater unionid mussel species in the United States are Federally listed as endangered or threatened species. Because freshwater mussels are broadly distributed across the United States, as are freshwater non-pulmonate snails, another sensitive invertebrate group, the USEPA used both groups in developing its ammonia criteria.

Site-Specific Criteria Option

The 2013 USEPA ammonia criteria provide states with an option to set their criteria based on its recommendation or to adopt other scientifically defensible criteria (40 CFR 131.11(b)(1)). Where a state can demonstrate, on a site-specific basis, that unionid mussels are not present (and that there are no related species of similar sensitivity for which mussels serve as a surrogate), states can use the USEPA Appendix N: "Site-Specific Criteria for Ammonia, Recalculation Procedure for Site-Specific Criteria Derivation" to better reflect the extent of the species at the site (USEPA, 2013). Pursuant to Appendix N, the USEPA requires the protection of existing uses of the

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waterbody at a minimum; the Department's SWQS define existing uses as "those uses actually attained in the waterbody on or after November 28, 1975, whether or not they are included in the Surface Water Quality Standards." The use of historical data should, therefore, be considered for presence determinations if surveys found mussels on or after November 28, 1975. This position is similar to that previously expressed by the USEPA in 1999 for determination of the presence of early life stages (ELS) of fish (see 64 Fed. Reg. 71974).

However, it is difficult and resource-intensive to demonstrate the lack of mussel presence at any site, as freshwater mussels are capable of colonizing new territory when they are carried on their fish hosts in the larval stage. Because of the ease of mussel colonization, the USEPA requires unionid mussel surveys to be repeated every two to three years, at a minimum. In light of the USEPA's recommendations, the Department will advise that NJPDES surface water dischargers that request site-specific ammonia criteria utilize the Technical Support Document for Conducting and Reviewing Freshwater Mussel Occurrence Surveys for the Development of Site-Specific Water Quality Criteria for Ammonia (USEPA, 2013A). To accommodate the recalculation option within the SWQS, the Department is proposing new N.J.A.C. 7:9B-1.5(c)10, which indicates that if a permittee demonstrates, to the satisfaction of the Department, that an alternative criterion is applicable in place of the freshwater total ammonia criteria specified at N.J.A.C. 7:9B-1.14(e)2, the Department may adopt an alternative criterion for that permittee.

Existing Criteria and Proposed Amendments (N.J.A.C. 7:9B-1.14(e))

The Department's existing ammonia criteria at N.J.A.C. 7:9B-1.14(e) were adopted in 2002 (see 34 N.J.R. 537(a)). These criteria are expressed as un-ionized ammonia (mg NH₃-N/L)

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and were developed using State-specific aquatic invertebrates and fish for freshwater trout production and maintenance (FW2-TP and FW2-TM), freshwater nontrout (FW2-NT), Pinelands waters (PL), saline estuarine (SE), and saline coastal (SC) stream classifications. The criteria for FW2-TP, FW2-TM, FW2-NT, and PL are temperature and pH dependent. Winter and summer criteria were also established for FW2-TP, FW2-TM, and FW2-NT waters in 2002 (see 34 N.J.R. 537(a)).

The Department determined that the USEPA 2013 freshwater acute and chronic aquatic life criteria for ammonia more comprehensively protect New Jersey's freshwater aquatic communities than the existing criteria. These criteria are intended to be protective of the freshwater aquatic community as a whole, including sensitive freshwater mussel and gill-breathing snails that are pervasive throughout the State and had not been included in the 2002 New Jersey-specific ammonia criteria. Accordingly, the Department is proposing to replace its existing freshwater total ammonia acute and chronic criteria (expressed as formulas) for freshwater classifications, FW2-NT, FW2-TM, and FW2-TP, with the USEPA recommended criteria formulas. The 2013 ammonia criteria are recommended for pH values between 6.5 and 9.5. New Jersey's Pineland (PL) waters' established pH criteria range is between 3.5 and 5.5. As a result, the 2013 USEPA criteria are not applicable to the PL waters. Additionally, because the USEPA has only recommended updated criteria for fresh waters, the Department is not proposing any changes to the criteria applicable to the SC and SE waters.

Table 3 below shows the proposed criteria as formulas expressed as milligrams per liter (mg/L) of total ammonia nitrogen. Ammonia toxicity is dependent on temperature (T) and pH, and the proposed formulas, therefore, incorporate these variables when calculating the numeric

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total ammonia criteria. The proposed acute and chronic criteria values, calculated using the equations in Table 3, are presented at given temperatures and pH levels and are expressed as mg/L of total ammonia nitrogen in Tables 4, 5, and 6 below based on USEPA (2013). For example, where a temperature of 15 degrees Celsius, a pH of 8.5, and an ambient concentration of 2.2 mg/L of total ammonia is measured in a trout production or trout maintenance stream, the proposed acute criteria based on Table 4 is 2.1 mg/L of total ammonia. In this example, the measured ammonia of 2.2 mg/L is greater than the acute criteria, and, therefore, would result in a finding of non-attainment for the ammonia criteria. If the stream in this example is instead classified as a non-trout (FW2-NT) stream, the proposed acute criteria based on Table 5 is 2.3, which is greater than the measured ambient total ammonia of 2.2 mg/L and would result in attainment of the ammonia criteria.

Table 3. Proposed Total Ammonia acute and chronic criteria (mg/L total ammonia nitrogen)

| Criteria applicable in FW2 waters | Classification |
|--|----------------|
| i. $\text{MIN} \left(\left(\frac{0.275}{1+10^{7.204-pH}} + \frac{39.0}{1+10^{pH-7.204}} \right), \left(0.7249 \times \left(\frac{0.0114}{1+10^{7.204-pH}} + \frac{1.6181}{1+10^{pH-7.204}} \right) \times (23.12 \times 10^{0.036 \times (20-T)}) \right) \right)$ (acute) | FW2-TP, FW2-TM |
| ii. $0.7249 \times \left(\frac{0.0114}{1+10^{7.204-pH}} + \frac{1.6181}{1+10^{pH-7.204}} \right) \times \text{MIN}(51.93, 23.12 \times 10^{0.036 \times (20-T)})$ (acute) | FW2-NT |
| iii. $0.8876 \times \left(\frac{0.0278}{1+10^{7.688-pH}} + \frac{1.1994}{1+10^{pH-7.688}} \right) \times (2.126 \times 10^{0.028 \times (20-\text{MAX}(T,7))})$ (chronic)* | All FW2 |

* The highest four-day average within the 30-day rolling averaging period should not be more than 2.5 times of chronic criteria.

Table 4: Total Ammonia Nitrogen (mg/L TAN) Acute Criteria for FW2-TP and FW2-TM Waters at Different pH and Temperature Values

| pH | Temperature (°C) | | | | | | | | | | | | | | | | |
|-----|------------------|------|------|------|------|------|-----------|------|------|------|------|------|------|------|------|------|------|
| | 0-14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| 6.5 | 33 | 33 | 32 | 29 | 27 | 25 | 23 | 21 | 19 | 18 | 16 | 15 | 14 | 13 | 12 | 11 | 9.9 |
| 6.6 | 31 | 31 | 30 | 28 | 26 | 24 | 22 | 20 | 18 | 17 | 16 | 14 | 13 | 12 | 11 | 10 | 9.5 |
| 6.7 | 30 | 30 | 29 | 27 | 24 | 22 | 21 | 19 | 18 | 16 | 15 | 14 | 13 | 12 | 11 | 9.8 | 9.0 |
| 6.8 | 28 | 28 | 27 | 25 | 23 | 21 | 20 | 18 | 17 | 15 | 14 | 13 | 12 | 11 | 10 | 9.2 | 8.5 |
| 6.9 | 26 | 26 | 25 | 23 | 21 | 20 | 18 | 17 | 15 | 14 | 13 | 12 | 11 | 10 | 9.4 | 8.6 | 7.9 |
| 7.0 | 24 | 24 | 23 | 21 | 20 | 18 | <u>17</u> | 15 | 14 | 13 | 12 | 11 | 10 | 9.4 | 8.6 | 8.0 | 7.3 |
| 7.1 | 22 | 22 | 21 | 20 | 18 | 17 | 15 | 14 | 13 | 12 | 11 | 10 | 9.3 | 8.5 | 7.9 | 7.2 | 6.7 |
| 7.2 | 20 | 20 | 19 | 18 | 16 | 15 | 14 | 13 | 12 | 11 | 9.8 | 9.1 | 8.3 | 7.7 | 7.1 | 6.5 | 6.0 |
| 7.3 | 18 | 18 | 17 | 16 | 14 | 13 | 12 | 11 | 10 | 9.5 | 8.7 | 8.0 | 7.4 | 6.8 | 6.3 | 5.8 | 5.3 |
| 7.4 | 15 | 15 | 15 | 14 | 13 | 12 | 11 | 9.8 | 9.0 | 8.3 | 7.7 | 7.0 | 6.5 | 6.0 | 5.5 | 5.1 | 4.7 |
| 7.5 | 13 | 13 | 13 | 12 | 11 | 10 | 9.2 | 8.5 | 7.8 | 7.2 | 6.6 | 6.1 | 5.6 | 5.2 | 4.8 | 4.4 | 4.0 |
| 7.6 | 11 | 11 | 11 | 10 | 9.3 | 8.6 | 7.9 | 7.3 | 6.7 | 6.2 | 5.7 | 5.2 | 4.8 | 4.4 | 4.1 | 3.8 | 3.5 |
| 7.7 | 9.6 | 9.6 | 9.3 | 8.6 | 7.9 | 7.3 | 6.7 | 6.2 | 5.7 | 5.2 | 4.8 | 4.4 | 4.1 | 3.8 | 3.5 | 3.2 | 3.0 |
| 7.8 | 8.1 | 8.1 | 7.9 | 7.2 | 6.7 | 6.1 | 5.6 | 5.2 | 4.8 | 4.4 | 4.0 | 3.7 | 3.4 | 3.2 | 2.9 | 2.7 | 2.5 |
| 7.9 | 6.8 | 6.8 | 6.6 | 6.0 | 5.6 | 5.1 | 4.7 | 4.3 | 4.0 | 3.7 | 3.4 | 3.1 | 2.9 | 2.6 | 2.4 | 2.2 | 2.1 |
| 8.0 | 5.6 | 5.6 | 5.4 | 5.0 | 4.6 | 4.2 | 3.9 | 3.6 | 3.3 | 3.0 | 2.8 | 2.6 | 2.4 | 2.2 | 2.0 | 1.9 | 1.7 |
| 8.1 | 4.6 | 4.6 | 4.5 | 4.1 | 3.8 | 3.5 | 3.2 | 3.0 | 2.7 | 2.5 | 2.3 | 2.1 | 2.0 | 1.8 | 1.7 | 1.5 | 1.4 |
| 8.2 | 3.8 | 3.8 | 3.7 | 3.5 | 3.1 | 2.9 | 2.7 | 2.4 | 2.3 | 2.1 | 1.9 | 1.8 | 1.6 | 1.5 | 1.4 | 1.3 | 1.2 |
| 8.3 | 3.1 | 3.1 | 3.1 | 2.8 | 2.6 | 2.4 | 2.2 | 2.0 | 1.9 | 1.7 | 1.6 | 1.4 | 1.3 | 1.2 | 1.1 | 1.0 | 0.96 |
| 8.4 | 2.6 | 2.6 | 2.5 | 2.3 | 2.1 | 2.0 | 1.8 | 1.7 | 1.5 | 1.4 | 1.3 | 1.2 | 1.1 | 1.0 | 0.93 | 0.86 | 0.79 |
| 8.5 | 2.1 | 2.1 | 2.1 | 1.9 | 1.8 | 1.6 | 1.5 | 1.4 | 1.3 | 1.2 | 1.1 | 0.98 | 0.90 | 0.83 | 0.77 | 0.71 | 0.65 |
| 8.6 | 1.8 | 1.8 | 1.7 | 1.6 | 1.5 | 1.3 | 1.2 | 1.1 | 1.0 | 0.96 | 0.88 | 0.81 | 0.75 | 0.69 | 0.63 | 0.59 | 0.54 |
| 8.7 | 1.5 | 1.5 | 1.4 | 1.3 | 1.2 | 1.1 | 1.0 | 0.94 | 0.87 | 0.80 | 0.74 | 0.68 | 0.62 | 0.57 | 0.53 | 0.49 | 0.45 |
| 8.8 | 1.2 | 1.2 | 1.2 | 1.1 | 1.0 | 0.93 | 0.86 | 0.79 | 0.73 | 0.67 | 0.62 | 0.57 | 0.52 | 0.48 | 0.44 | 0.41 | 0.37 |
| 8.9 | 1.0 | 1.0 | 1.0 | 0.93 | 0.85 | 0.79 | 0.72 | 0.67 | 0.61 | 0.56 | 0.52 | 0.48 | 0.44 | 0.40 | 0.37 | 0.34 | 0.32 |
| 9.0 | 0.88 | 0.88 | 0.86 | 0.79 | 0.73 | 0.67 | 0.62 | 0.57 | 0.52 | 0.48 | 0.44 | 0.41 | 0.37 | 0.34 | 0.32 | 0.29 | 0.27 |

Table 5: Total Ammonia Nitrogen (mg/L TAN) Acute Criteria for FW2-NT Waters at Different pH and Temperature

| pH | Temperature (°C) | | | | | | | | | | | | | | | | | | | | |
|-----|------------------|-----|-----|-----|-----|------|------|------|------|------|-----------|------|------|------|------|------|------|------|------|------|------|
| | 0-10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| 6.5 | 51 | 48 | 44 | 41 | 37 | 34 | 32 | 29 | 27 | 25 | 23 | 21 | 19 | 18 | 16 | 15 | 14 | 13 | 12 | 11 | 9.9 |
| 6.6 | 49 | 46 | 42 | 39 | 36 | 33 | 30 | 28 | 26 | 24 | 22 | 20 | 18 | 17 | 16 | 14 | 13 | 12 | 11 | 10 | 9.5 |
| 6.7 | 46 | 44 | 40 | 37 | 34 | 31 | 29 | 27 | 24 | 22 | 21 | 19 | 18 | 16 | 15 | 14 | 13 | 12 | 11 | 9.8 | 9.0 |
| 6.8 | 44 | 41 | 38 | 35 | 32 | 30 | 27 | 25 | 23 | 21 | 20 | 18 | 17 | 15 | 14 | 13 | 12 | 11 | 10 | 9.2 | 8.5 |
| 6.9 | 41 | 38 | 35 | 32 | 30 | 28 | 25 | 23 | 21 | 20 | 18 | 17 | 15 | 14 | 13 | 12 | 11 | 10 | 9.4 | 8.6 | 7.9 |
| 7.0 | 38 | 35 | 33 | 30 | 28 | 25 | 23 | 21 | 20 | 18 | <u>17</u> | 15 | 14 | 13 | 12 | 11 | 10 | 9.4 | 8.6 | 7.9 | 7.3 |
| 7.1 | 34 | 32 | 30 | 27 | 25 | 23 | 21 | 20 | 18 | 17 | 15 | 14 | 13 | 12 | 11 | 10 | 9.3 | 8.5 | 7.9 | 7.2 | 6.7 |
| 7.2 | 31 | 29 | 27 | 25 | 23 | 21 | 19 | 18 | 16 | 15 | 14 | 13 | 12 | 11 | 9.8 | 9.1 | 8.3 | 7.7 | 7.1 | 6.5 | 6.0 |
| 7.3 | 27 | 26 | 24 | 22 | 20 | 18 | 17 | 16 | 14 | 13 | 12 | 11 | 10 | 9.5 | 8.7 | 8.0 | 7.4 | 6.8 | 6.3 | 5.8 | 5.3 |
| 7.4 | 24 | 22 | 21 | 19 | 18 | 16 | 15 | 14 | 13 | 12 | 11 | 9.8 | 9.0 | 8.3 | 7.7 | 7.0 | 6.5 | 6.0 | 5.5 | 5.1 | 4.7 |
| 7.5 | 21 | 19 | 18 | 17 | 15 | 14 | 13 | 12 | 11 | 10 | 9.2 | 8.5 | 7.8 | 7.2 | 6.6 | 6.1 | 5.6 | 5.2 | 4.8 | 4.4 | 4.0 |
| 7.6 | 18 | 17 | 15 | 14 | 13 | 12 | 11 | 10 | 9.3 | 8.6 | 7.9 | 7.3 | 6.7 | 6.2 | 5.7 | 5.2 | 4.8 | 4.4 | 4.1 | 3.8 | 3.5 |
| 7.7 | 15 | 14 | 13 | 12 | 11 | 10 | 9.3 | 8.6 | 7.9 | 7.3 | 6.7 | 6.2 | 5.7 | 5.2 | 4.8 | 4.4 | 4.1 | 3.8 | 3.5 | 3.2 | 2.9 |
| 7.8 | 13 | 12 | 11 | 10 | 9.3 | 8.5 | 7.9 | 7.2 | 6.7 | 6.1 | 5.6 | 5.2 | 4.8 | 4.4 | 4.0 | 3.7 | 3.4 | 3.2 | 2.9 | 2.7 | 2.5 |
| 7.9 | 11 | 9.9 | 9.1 | 8.4 | 7.7 | 7.1 | 6.6 | 3.0 | 5.6 | 5.1 | 4.7 | 4.3 | 4.0 | 3.7 | 3.4 | 3.1 | 2.9 | 2.6 | 2.4 | 2.2 | 2.1 |
| 8.0 | 8.8 | 8.2 | 7.6 | 7.0 | 6.4 | 5.9 | 5.4 | 5.0 | 4.6 | 4.2 | 3.9 | 3.6 | 3.3 | 3.0 | 2.8 | 2.6 | 2.4 | 2.2 | 2.0 | 1.9 | 1.7 |
| 8.1 | 7.2 | 6.8 | 6.3 | 5.8 | 5.3 | 4.9 | 4.5 | 4.1 | 3.8 | 3.5 | 3.2 | 3.0 | 2.7 | 2.5 | 2.3 | 2.1 | 2.0 | 1.8 | 1.7 | 1.5 | 1.4 |
| 8.2 | 6.0 | 5.6 | 5.2 | 4.8 | 4.4 | 4.0 | 3.7 | 3.4 | 3.1 | 2.9 | 2.7 | 2.4 | 2.3 | 2.1 | 1.9 | 1.8 | 1.6 | 1.5 | 1.4 | 1.3 | 1.2 |
| 8.3 | 4.9 | 4.6 | 4.3 | 3.9 | 3.6 | 3.3 | 3.1 | 2.8 | 2.6 | 2.4 | 2.2 | 2.0 | 1.9 | 1.7 | 1.6 | 1.4 | 1.3 | 1.2 | 1.1 | 1.0 | 0.96 |
| 8.4 | 4.1 | 3.8 | 3.5 | 3.2 | 3.0 | 2.7 | 2.5 | 2.3 | 2.1 | 2.0 | 1.8 | 1.7 | 1.5 | 1.4 | 1.3 | 1.2 | 1.1 | 1.0 | 0.93 | 0.86 | 0.79 |
| 8.5 | 3.3 | 3.1 | 2.9 | 2.7 | 2.4 | 2.3 | 2.1 | 1.9 | 1.8 | 1.6 | 1.5 | 1.4 | 1.3 | 1.2 | 1.1 | 0.98 | 0.90 | 0.83 | 0.77 | 0.71 | 0.65 |
| 8.6 | 2.8 | 2.6 | 2.4 | 2.2 | 2.0 | 1.9 | 1.7 | 1.6 | 1.5 | 1.3 | 1.2 | 1.1 | 1.0 | 0.96 | 0.88 | 0.81 | 0.75 | 0.69 | 0.63 | 0.58 | 0.54 |
| 8.7 | 2.3 | 2.2 | 2.0 | 1.8 | 1.7 | 1.6 | 1.4 | 1.3 | 1.2 | 1.1 | 1.0 | 0.94 | 0.87 | 0.80 | 0.74 | 0.68 | 0.62 | 0.57 | 0.53 | 0.49 | 0.45 |
| 8.8 | 1.9 | 1.8 | 1.7 | 1.5 | 1.4 | 1.3 | 1.2 | 1.1 | 1.0 | 0.93 | 0.86 | 0.79 | 0.73 | 0.67 | 0.62 | 0.57 | 0.52 | 0.48 | 0.44 | 0.41 | 0.37 |
| 8.9 | 1.6 | 1.5 | 1.4 | 1.3 | 1.2 | 1.1 | 1.0 | 0.93 | 0.85 | 0.79 | 0.72 | 0.67 | 0.61 | 0.56 | 0.52 | 0.48 | 0.44 | 0.40 | 0.37 | 0.34 | 0.32 |
| 9.0 | 1.4 | 1.3 | 1.2 | 1.1 | 1.0 | 0.93 | 0.86 | 0.79 | 0.73 | 0.67 | 0.62 | 0.57 | 0.52 | 0.48 | 0.44 | 0.41 | 0.37 | 0.34 | 0.32 | 0.29 | 0.27 |

Table 6: Total Ammonia Nitrogen (mg/L TAN) Chronic Criteria for all FW2 Waters at Different pH and Temperature Values

| pH | Temperature (°C) | | | | | | | | | | | | | | | | | | | | | | | |
|-----|------------------|------|------|------|------|------|------|------|------|------|------|------|------|------------|------|------|------|------|------|------|------|------|------|------|
| | 0-7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| 6.5 | 4.9 | 4.6 | 4.3 | 4.1 | 3.8 | 3.6 | 3.3 | 3.1 | 2.9 | 2.8 | 2.6 | 2.4 | 2.3 | 2.1 | 2.0 | 1.9 | 1.8 | 1.6 | 1.5 | 1.5 | 1.4 | 1.3 | 1.2 | 1.1 |
| 6.6 | 4.8 | 4.5 | 4.3 | 4.0 | 3.8 | 3.5 | 3.3 | 3.1 | 2.9 | 2.7 | 2.5 | 2.4 | 2.2 | 2.1 | 2.0 | 1.8 | 1.7 | 1.6 | 1.5 | 1.4 | 1.3 | 1.3 | 1.2 | 1.1 |
| 6.7 | 4.8 | 4.5 | 4.2 | 3.9 | 3.7 | 3.5 | 3.2 | 3.0 | 2.8 | 2.7 | 2.5 | 2.3 | 2.2 | 2.1 | 1.9 | 1.8 | 1.7 | 1.6 | 1.5 | 1.4 | 1.3 | 1.2 | 1.2 | 1.1 |
| 6.8 | 4.6 | 4.4 | 4.1 | 3.8 | 3.6 | 3.4 | 3.2 | 3.0 | 2.8 | 2.6 | 2.4 | 2.3 | 2.1 | 2.0 | 1.9 | 1.8 | 1.7 | 1.6 | 1.5 | 1.4 | 1.3 | 1.2 | 1.1 | 1.1 |
| 6.9 | 4.5 | 4.2 | 4.0 | 3.7 | 3.5 | 3.3 | 3.1 | 2.9 | 2.7 | 2.5 | 2.4 | 2.2 | 2.1 | 2.0 | 1.8 | 1.7 | 1.6 | 1.5 | 1.4 | 1.3 | 1.2 | 1.2 | 1.1 | 1.0 |
| 7.0 | 4.4 | 4.1 | 3.8 | 3.6 | 3.4 | 3.2 | 3.0 | 2.8 | 2.6 | 2.4 | 2.3 | 2.2 | 2.0 | <u>1.9</u> | 1.8 | 1.7 | 1.6 | 1.5 | 1.4 | 1.3 | 1.2 | 1.1 | 1.1 | 0.99 |
| 7.1 | 4.2 | 3.9 | 3.7 | 3.5 | 3.2 | 3.0 | 2.8 | 2.7 | 2.5 | 2.3 | 2.2 | 2.1 | 1.9 | 1.8 | 1.7 | 1.6 | 1.5 | 1.4 | 1.3 | 1.2 | 1.2 | 1.1 | 1.0 | 0.95 |
| 7.2 | 4.0 | 3.7 | 3.5 | 3.3 | 3.1 | 2.9 | 2.7 | 2.5 | 2.4 | 2.2 | 2.1 | 2.0 | 1.8 | 1.7 | 1.6 | 1.5 | 1.4 | 1.3 | 1.3 | 1.2 | 1.1 | 1.0 | 0.96 | 0.90 |
| 7.3 | 3.8 | 3.5 | 3.3 | 3.1 | 2.9 | 2.7 | 2.6 | 2.4 | 2.2 | 2.1 | 2.0 | 1.8 | 1.7 | 1.6 | 1.5 | 1.4 | 1.3 | 1.3 | 1.2 | 1.1 | 1.0 | 0.97 | 0.91 | 0.85 |
| 7.4 | 3.5 | 3.3 | 3.1 | 2.9 | 2.7 | 2.5 | 2.4 | 2.2 | 2.1 | 2.0 | 1.8 | 1.7 | 1.6 | 1.5 | 1.4 | 1.3 | 1.3 | 1.2 | 1.1 | 1.0 | 0.96 | 0.90 | 0.85 | 0.79 |
| 7.5 | 3.2 | 3.0 | 2.8 | 2.7 | 2.5 | 2.3 | 2.2 | 2.1 | 1.9 | 1.8 | 1.7 | 1.6 | 1.5 | 1.4 | 1.3 | 1.2 | 1.2 | 1.1 | 1.0 | 0.95 | 0.89 | 0.83 | 0.78 | 0.73 |
| 7.6 | 2.9 | 2.8 | 2.6 | 2.4 | 2.3 | 2.1 | 2.0 | 1.9 | 1.8 | 1.6 | 1.5 | 1.4 | 1.4 | 1.3 | 1.2 | 1.1 | 1.1 | 0.98 | 0.92 | 0.86 | 0.81 | 0.76 | 0.71 | 0.67 |
| 7.7 | 2.6 | 2.4 | 2.3 | 2.2 | 2.0 | 1.9 | 1.8 | 1.7 | 1.6 | 1.5 | 1.4 | 1.3 | 1.2 | 1.1 | 1.1 | 1.0 | 0.94 | 0.88 | 0.83 | 0.78 | 0.73 | 0.68 | 0.64 | 0.60 |
| 7.8 | 2.3 | 2.2 | 2.1 | 1.9 | 1.8 | 1.7 | 1.6 | 1.5 | 1.4 | 1.3 | 1.2 | 1.2 | 1.1 | 1.0 | 0.95 | 0.89 | 0.84 | 0.79 | 0.74 | 0.69 | 0.65 | 0.61 | 0.57 | 0.53 |
| 7.9 | 2.1 | 1.9 | 1.8 | 1.7 | 1.6 | 1.5 | 1.4 | 1.3 | 1.2 | 1.2 | 1.1 | 1.0 | 0.95 | 0.89 | 0.84 | 0.79 | 0.74 | 0.69 | 0.65 | 0.61 | 0.57 | 0.53 | 0.50 | 0.47 |
| 8.0 | 1.8 | 1.7 | 1.6 | 1.5 | 1.4 | 1.3 | 1.2 | 1.1 | 1.1 | 1.0 | 0.94 | 0.88 | 0.83 | 0.78 | 0.73 | 0.68 | 0.64 | 0.60 | 0.56 | 0.53 | 0.50 | 0.44 | 0.44 | 0.41 |
| 8.1 | 1.5 | 1.5 | 1.4 | 1.3 | 1.2 | 1.1 | 1.1 | 0.99 | 0.92 | 0.87 | 0.81 | 0.76 | 0.71 | 0.67 | 0.63 | 0.59 | 0.55 | 0.52 | 0.49 | 0.46 | 0.43 | 0.40 | 0.38 | 0.35 |
| 8.2 | 1.3 | 1.2 | 1.2 | 1.1 | 1.0 | 0.96 | 0.90 | 0.84 | 0.79 | 0.74 | 0.70 | 0.65 | 0.61 | 0.57 | 0.54 | 0.50 | 0.47 | 0.44 | 0.42 | 0.39 | 0.37 | 0.34 | 0.32 | 0.30 |
| 8.3 | 1.1 | 1.1 | 0.99 | 0.93 | 0.87 | 0.82 | 0.76 | 0.72 | 0.67 | 0.63 | 0.59 | 0.55 | 0.52 | 0.49 | 0.46 | 0.43 | 0.40 | 0.38 | 0.35 | 0.33 | 0.31 | 0.29 | 0.27 | 0.26 |
| 8.4 | 0.95 | 0.89 | 0.84 | 0.79 | 0.74 | 0.69 | 0.65 | 0.61 | 0.57 | 0.53 | 0.50 | 0.47 | 0.44 | 0.41 | 0.39 | 0.36 | 0.34 | 0.32 | 0.30 | 0.28 | 0.26 | 0.25 | 0.23 | 0.22 |
| 8.5 | 0.80 | 0.75 | 0.71 | 0.67 | 0.62 | 0.58 | 0.55 | 0.51 | 0.48 | 0.45 | 0.42 | 0.40 | 0.37 | 0.35 | 0.33 | 0.31 | 0.29 | 0.27 | 0.25 | 0.24 | 0.22 | 0.21 | 0.20 | 0.18 |
| 8.6 | 0.68 | 0.64 | 0.60 | 0.56 | 0.53 | 0.49 | 0.46 | 0.43 | 0.41 | 0.38 | 0.36 | 0.33 | 0.31 | 0.29 | 0.28 | 0.26 | 0.24 | 0.23 | 0.21 | 0.20 | 0.19 | 0.18 | 0.16 | 0.15 |
| 8.7 | 0.57 | 0.54 | 0.51 | 0.47 | 0.44 | 0.42 | 0.39 | 0.37 | 0.34 | 0.32 | 0.30 | 0.28 | 0.27 | 0.25 | 0.23 | 0.22 | 0.21 | 0.19 | 0.18 | 0.17 | 0.16 | 0.15 | 0.14 | 0.13 |
| 8.8 | 0.49 | 0.46 | 0.43 | 0.40 | 0.38 | 0.35 | 0.33 | 0.31 | 0.29 | 0.27 | 0.26 | 0.24 | 0.23 | 0.21 | 0.20 | 0.19 | 0.17 | 0.16 | 0.15 | 0.14 | 0.13 | 0.13 | 0.12 | 0.11 |
| 8.9 | 0.42 | 0.39 | 0.37 | 0.34 | 0.32 | 0.30 | 0.28 | 0.27 | 0.25 | 0.23 | 0.22 | 0.21 | 0.19 | 0.18 | 0.17 | 0.16 | 0.15 | 0.14 | 0.13 | 0.12 | 0.12 | 0.11 | 0.10 | 0.09 |
| 9.0 | 0.36 | 0.34 | 0.32 | 0.30 | 0.28 | 0.26 | 0.24 | 0.23 | 0.21 | 0.20 | 0.19 | 0.18 | 0.17 | 0.16 | 0.15 | 0.14 | 0.13 | 0.12 | 0.11 | 0.11 | 0.10 | 0.09 | 0.09 | 0.08 |

To incorporate these changes, the Department is proposing amendments to the existing ammonia criteria at N.J.A.C. 7:9B-1.14(e) to recodify un-ionized ammonia criteria at N.J.A.C. 7:9B-1.14(e)1; to delete un-ionized ammonia criteria for freshwater classifications FW2-TP, FW2-TM, and FW2-NT; to recodify the existing un-ionized ammonia criteria for waters classified as PL, SE, and SC from N.J.A.C. 7:9B-1.14(e)3, 4, and 5 to N.J.A.C. 7:9B-1.14(e)1i, ii, and iii; and to delete the footnotes at N.J.A.C. 7:9B-1.14(e), as they are no longer applicable. The Department is also proposing to replace the existing freshwater un-ionized ammonia criteria, which differ by season and trout classification, with the USEPA recommended total ammonia acute and chronic criteria at N.J.A.C. 7:9B-1.14(e)2 that apply year-round to all FW2 waters regardless of trout classification. Additionally, based on the 2013 USEPA recommendations, the Department is proposing to replace the existing three-hour averaging period for the ammonia acute criteria with a one-hour averaging period. The duration for chronic criteria, which is a 30-day averaging period, will remain the same.

The Department is proposing to retain the existing applicable design flows, which are the minimum average one consecutive day flow with a statistical recurrence interval of 10 years (MA1CD10) for acute criteria and the minimum average 30 consecutive day flow with a statistical recurrence interval of 10 years (MA30CD10) for chronic criteria at proposed N.J.A.C. 7:9B-1.14(e)2. The Department is proposing that the four-day highest average within the 30 days should not be greater than 2.5 times the chronic criteria, as recommended by the USEPA. The Department is proposing to retain the existing frequency policy that no exceedance of criteria shall be permitted at or above the design flows specified above.

Water Quality Standards Variance

Pursuant to the Federal Regulations at 40 CFR 131.3(o), a WQS variance is defined as a time-limited designated use and criterion for a specific pollutant(s) or water quality parameter(s) that reflect the highest attainable condition (HAC) during the term of the WQS variance. An HAC is the best water quality condition that can be feasibly attained during the term of the WQS variance and is closest to the underlying designated use and criteria. 40 CFR 131.14 requires that a WQS variance specifies the highest attainable interim use and numeric criterion, or an interim effluent condition that reflects the HAC for a specific permittee(s) during the term of the WQS variance.

Proposed Water Quality Standards Variance Policies (N.J.A.C. 7:9B-1.16)

The Department is proposing new N.J.A.C. 7:9B-1.16 to establish WQS variance policies in accordance with the provisions at 40 CFR 131.14. The Department is also proposing to include definitions of WQS variance and other relevant terms at N.J.A.C. 7:9B-1.4. Also, the Department is proposing to include definitions of WQS variance and other relevant terms at N.J.A.C. 7:9B-1.4. The policies are proposed at N.J.A.C. 7:9B-1.16(b); the regulatory conditions, documentation, and submission requirements that must be satisfied by a permittee requesting a WQS variance are proposed at N.J.A.C. 7:9B-1.16(c) and (d); and the reevaluation requirements for a WQS variance are proposed at N.J.A.C. 7:9B-1.16(e).

Pursuant to 40 CFR 131.14, the Department must conduct additional rulemaking to adopt a specific WQS variance for the specific substance, permittee, or waterbody/waterbody segment. Additionally, a WQS variance adopted by the Department must be reviewed and approved by the USEPA prior to its implementation. Subsequent to the USEPA's review and approval, a WQS variance becomes the interim water quality standard for a specified duration of a WQS variance

when implementing NJPDES permitting requirements pursuant to N.J.A.C. 7:14A and certifications pursuant to Section 401 of the Federal Act. A WQS variance does not replace the water quality standards, or the designated use of a waterbody and applicable criterion of a substance as established at N.J.A.C. 7:9B. An approved WQS variance will not be considered in the analysis when developing the biennial Integrated Report that describes the health of New Jersey's waters, as required pursuant to Sections 303(d) and 305(b) of the Federal Act and the New Jersey Water Quality Planning Act. Similarly, an approved WQS variance will not be applicable for site remediation required pursuant to the Technical Requirements for Site Remediation, pursuant to N.J.A.C. 7:26E.

The Department is proposing to require a WQS variance to include a specific substance, permittee, and/or waterbody/waterbody segment, the time the WQS variance remains in effect, and a reevaluation schedule, if the duration is longer than five years. A permittee requesting a WQS variance must justify and demonstrate to the satisfaction of the Department that the SWQS cannot be met due to natural, physical, irretrievable human-caused conditions, or controls more stringent than those required at Sections 301(b) and 306 of the Federal Act, and would result in substantial and widespread economic and social impact, as proposed at N.J.A.C. 7:9B-1.16(b)4.

In addition to the justification requirements as proposed at N.J.A.C. 7:9B-1.16(b)4, a WQS variance may not be adopted under certain circumstances. A WQS variance will not be approved for an aquatic life protection criterion, as listed at N.J.A.C. 7:9B-1.14, if the Department determines that the WQS variance would likely jeopardize the existence of an endangered or threatened species, as listed at Section 7 of the Federal Endangered Species Act of 1973 as amended, or result in the destruction of its habitat. Any action that would likely jeopardize the continued existence of an endangered or threatened species, or result in the destruction or adverse

modification of such species' critical habitat, is prohibited. The Department evaluates the impacts to endangered or threatened species and their habitat as part of the initial evaluation before issuing a permit for any new or expanded permittee as part of the NJPDES antidegradation analysis. As specified at 40 CFR 131.14(a)(4), the Department will not adopt a WQS variance where the designated use and criterion can be achieved by implementing technology-based effluent limits required at Sections 301(b) and 306 of the Federal Act. In addition, the proposed WQS variance policies will not apply to thermal discharges. Any thermal discharges must be consistent with section 316(a) of the Federal Act and existing N.J.A.C. 7:9B-1.5(c)8, which is proposed to be relocated to N.J.A.C. 7:9B-1.5(c)9 and (h)2i(3).

A WQS variance may be requested by a permittee or initiated by the Department. For the Department to determine whether one or more of the conditions proposed at N.J.A.C. 7:9B-1.16(b)4 are satisfied, any permittee requesting a new WQS variance is required to submit ambient, influent, and effluent data, a description of existing treatment, additional associated technologies and costs/affordability associated, cost-effective and reasonable best management practices for nonpoint source controls, concentration levels achieved, anthropogenic sources, legacy contamination, influent sources, and documentation regarding the determination of the HAC. In the event that the Department initiates the process to adopt a WQS variance, the Department may require the permittees affected by the WQS variance to submit the above data. A WQS variance, which satisfied the above requirements, may be proposed to be adopted for a single permittee or multiple permittees. A WQS variance may also be proposed to be adopted for a waterbody segment or an entire watershed. Any WQS variance developed for a waterbody segment or a watershed applies only to those permittees listed in the adopted and USEPA-approved WQS variance.

If the designated use and criterion is unattainable, as it applies to multiple permittees because they are all experiencing challenges in meeting their WQBELs for the same substance for the same reason, regardless of whether or not they are located on the same waterbody, then one WQS variance may be developed and adopted that applies to all these permittees (a multiple permittee variance), so long as the variance is consistent with the Federal Act and implementing regulations. Where it can be demonstrated that the designated use and criterion currently in place for a specific substance is not attainable immediately (or for a limited period of time) for an entire waterbody, a waterbody WQS variance may be adopted as an alternative to a designated use change (waterbody variance), as long as the WQS variance is consistent with the Federal Act and implementing regulations. In such an instance, the WQS variance applies to the waterbody itself, rather than to any specific source(s).

When the Department adopts a waterbody WQS variance, the Department will work with permittees to determine and implement adaptive management approaches for a specific pollutant.

In addition, the waterbody itself can benefit from a waterbody WQS variance by achieving reduction of the polluting substance and striving towards attaining the waterbody's designated use and associated criteria.

The Department is proposing to require that the duration of a WQS variance be only as long as necessary to achieve the HAC. If a WQS variance has a duration longer than five years, a schedule for reevaluation must be included. The reevaluation of the WQS variance must satisfy the public participation requirement and submission of reevaluation results to the Department and the USEPA. According to the USEPA, an approved WQS variance for a substance or substances must either meet the water quality standard for the substance upon the expiration of the variance, or the state or tribe must adopt a new WQS variance, or justify and successfully readopt the current

WQS variance subject to the review and approval of the Department and the USEPA. Pursuant to 40 CFR 131.20(a), WQS variances must be included in the triennial review of the Department's water quality standards.

As discussed above, an HAC is the highest attainable interim use/criterion, or greatest pollutant reduction achievable with the pollutant control technologies installed at the time, where no additional feasible pollutant control technology can be identified for a permittee-specific, waterbody, or waterbody segment WQS variance. For a permittee-specific WQS variance, an HAC could also be an interim effluent condition that reflects the greatest pollutant reduction achievable along with the necessary pollutant minimization program (PMP).

A PMP must contain a structured set of activities, including identification and quantification of source(s) of substance(s) within the permittee's collection system, and an evaluation of strategies to minimize the discharge of substance or substances on-site and in the collection system to the maximum extent practicable. The permittee must submit, to the Department, an implementation schedule for the improvement of processes and installation of pollutant controls that will prevent and reduce pollutant loadings.

A numeric effluent condition that reflects the HAC is a reasonable option because the resulting instream concentration reflects the highest attainable interim use and interim criterion and, therefore, the interim numeric effluent condition is acting as a surrogate for the interim use and interim criterion. If current effluent quality represents the HAC for a specific permittee, then this would become the interim requirement during the term of the WQS variance. In situations where a variance addresses a pollutant, such as arsenic, for which no feasible wastewater treatment option can be identified, an interim numeric water quality-based effluent condition reflecting the

levels currently achievable and a requirement to develop and implement a PMP together would constitute the HAC.

The Department is proposing that, where a permittee is requesting a WQS variance for the water uses specified at section 101(a)(2) of the Federal Act (protection and propagation of fish, shellfish, and wildlife, and recreation in and on the water), the permittee must demonstrate that attaining the designated use and criterion is not feasible because of natural, physical, human-caused conditions, and/or substantial economic and/or social impacts. Additionally, in order to obtain a variance, a permittee must show that it would be unable to meet the stream designated use and criteria through any feasible stream restoration or stream reconfiguration activities within the variance duration. A permittee requesting a WQS variance for uses not specified at section 101(a)(2) of the Federal Act must provide documentation to justify how the permittee's consideration of the use and value of the water for those uses listed at section 131.10(a) of the Federal Act appropriately supports the WQS variance and term.

Pursuant to 40 CFR 131.14(b)(1)(v) and for a WQS variance with a term greater than five years, a state must specify a frequency to reevaluate the highest attainable condition using all existing and readily available information and a provision specifying how the state intends to obtain public input on the reevaluation. Such reevaluations must occur no less frequently than every five years after USEPA approval of the WQS variance and the results of such reevaluation must be submitted to the USEPA within 30 days of completion of the reevaluation. Accordingly, the Department is proposing that, as part of the reevaluation, a permittee must submit all the required data listed at N.J.A.C. 7:9B-1.16(c), identify whether any new pollutant control technologies are available, and submit an updated PMP for the subsequent five-year permit cycle. If the submission of the reevaluation is in accordance with the requirements at N.J.A.C. 7:9B-

1.16(c), the Department would approve and authorize a WQS variance for an additional five years, or until the term of the variance concludes, whichever is earlier. If the submission indicates that a revision to the HAC is not appropriate, the Department will propose a permit action, or suspend the WQS variance until the submission is satisfactory.

The Department anticipates that the WQS variance will be useful to address implementation challenges for situations when the water quality criterion for a substance or the designated use of a waterbody/waterbody segment(s) cannot be attained due to the lack of feasible treatment technologies, lack of analytical methods to measure the substance to the criterion thresholds, or the potential to cause widespread social and economic impact, if implemented. An example of such a situation is arsenic. The existing human health arsenic criteria are 0.017 µg/L for freshwaters and 0.061 µg/L for saline waters. The USEPA-approved analytical methods are not available to detect arsenic to as low as 0.017 µg/L, and the Department has determined the minimum level of quantitation, or recommended quantitation level (RQL) for total arsenic in wastewater is two µg/L (see <https://www.nj.gov/dep/dwq/pdf/sstm-faq.pdf>). Additionally, a bench-scale in-laboratory study initiated and funded by the Department has demonstrated that current conventional treatment technologies, such as coagulation-sedimentation-filtration, cannot remove arsenic from municipal wastewater to levels lower than the RQL. Treatment technologies, such as reverse osmosis, though effective for drinking water, may not be economically feasible for wastewater because of the higher organic biomass and phosphate concentrations in municipal wastewater effluents. Further, a 2016 literature search conducted by the Department did not result in any study demonstrating the use of reverse osmosis to effectively remove arsenic from municipal wastewater discharges. Due to the current lack of sufficiently sensitive analytical methods to demonstrate attainment and feasible treatment technologies to remove arsenic from

wastewater, the municipal permittees would not be able to comply with a WQBEL for arsenic. The Department may issue a WQBEL to a permittee when the Department determines that the permittee causes, has reasonable potential to cause, or contributes to an excursion above SWQS, pursuant to N.J.A.C. 7:14A-13.2(a)2. The Department anticipates that the proposed WQS variance policies will be an effective implementation pathway that would allow permittees, in certain situations, to remove arsenic to an attainable threshold that is technologically and economically feasible. At the same time, the permittees would be undertaking measures to improve the ambient water quality.

The Department also anticipates that the proposed policies for WQS variances will lead to improved water quality over time, and in some cases, full attainment of designated uses due to advances in treatment technologies, control practices, or other changes in circumstances, thereby furthering the fishable and swimmable goals of the Federal Act section 101(a)(2).

NJPDES “variances”

The Department is additionally proposing amendments to New Jersey Pollutant Discharge Elimination System (NJPDES) rules. The NJPDES rules contain provisions referred to as “variances” within the “Procedures and Conditions Applicable to NJPDES-DGW Permits” at N.J.A.C. 7:14A-11.7. However, these provisions are, in fact, modifications to WQBELs, as established by the SWQS at N.J.A.C. 7:9B-1.8 and 1.9, and not WQS variances as defined by the USEPA at 40 CFR 131.3. Because the Department is proposing to establish new provisions regarding WQS variances and to avoid confusing the regulated community, the Department is proposing to clarify that the variances allowed for in the NJPDES rules are modifications to WQBELs. Additionally, the Department is proposing new N.J.A.C. 7:14A-11.7(e) to require a

permittee that requests a WQS variance to follow the proposed provisions at N.J.A.C. 7:9B-1.16, as described above.

Proposed General Amendments

N.J.A.C. 7:9B-1.4 Definitions

The Department is proposing to amend the definition of DRBC Water Quality Regulations to remove the date to avoid revisions to the definition every time the DRBC rules are updated. The Department is also proposing to delete three definitions that are no longer used in the SWQS rule: aquatic substrata, NPDES, and zone.

N.J.A.C. 7:9B-1.14 Water Quality Criteria

At N.J.A.C. 7:9B-1.14(d)4, the Department is proposing amendments to Total Phosphorus criteria for non-tidal streams and lakes at N.J.A.C. 7:9B-1.14(d)4ii(1) and (2) to include “site-specific criteria,” in addition to watershed-specific translators, to be consistent with the nutrient policies at N.J.A.C. 7:9B-1.5(g)2.

At N.J.A.C. 7:9B-1.14(g)3i, the Department is correcting the name of the subwatershed. The second subwatershed listed as Dead River above Harrisons Brook, numbered 02030103010100, should be Dead River below Harrisons Brook.

Social Impact

The proposed amendments to the SWQS will advance the continued protection of the surface waters of the State and will, therefore, have an overall positive social impact. Without the SWQS, the Department would not have water quality criteria, stream classifications, and antidegradation designations needed to protect and enhance water quality for aquatic life, water supplies, shellfish harvesting, recreation, and other appropriate uses. The water quality criteria in

the SWQS are used by the NJPDES program to develop effluent limitations and other permit requirements and by the Land Resource Protection Program to demonstrate compliance with the Clean Water Act (Federal Act) while approving the water quality certificates to advance the protection, maintenance, and enhancement of the State's waters.

The proposed amendments to the bacterial quality criteria and freshwater ammonia criteria will enable the Department to issue NJPDES permits with WQBELs based on the updated criteria that reflect the most recent USEPA science-based recommendations. These requirements will have a positive social impact by appropriately protecting public health and respective designated uses.

The proposed new provisions of the WQS variance will not have any impact at this time. However, when a WQS variance for a given substance is developed, there will be a positive social impact because it will allow incremental improvement toward attaining designated uses, such as recreation and public water supply.

Economic Impact

Potential economic impacts of the proposed SWQS amendments are addressed in three parts below: bacterial quality criteria, freshwater ammonia criteria, and new WQS variance policies. Overall, the Department does not anticipate substantial economic impact from the proposed amendments and the new WQS variance provisions. However, there is the potential for a small number of entities, specifically wastewater treatment plants, to experience more significant economic impacts in complying with the proposed freshwater ammonia criteria. The magnitude of the economic impact is dependent on site- and facility-specific activities, conditions, and the approaches chosen to comply with the SWQS.

Bacterial Quality Criteria

Impacts to Recreation

The proposed bacterial quality criteria advance the State's policy, codified at N.J.A.C. 7:9B-1.5(a)2, to restore, enhance, and maintain the chemical, physical, and biological integrity of its waters, to protect public health, to safeguard fish and aquatic life and scenic and ecological values, and to enhance the domestic, municipal, recreational, industrial, and other uses of water.

Updating recreational water quality standards based on the USEPA's 2012 recommendations ensures the protection of public health in waters designated for primary contact recreation by ensuring that the most up-to-date epidemiological studies are used to determine acceptable illness rates. Studies conducted by the USEPA that informed its recommendations included cases of gastrointestinal illnesses that may not always present with a fever, thereby being more conservative and protective. Adopting more stringent criteria reflecting these revised illness rates will protect human health and allow the State to prevent economic costs incurred from the spread of waterborne illnesses. DeFlorio-Barker et al. estimated the per case average cost of acute gastrointestinal illness as between \$56.94 and \$308.74, adjusted through the Consumer Price Index to 2019 dollars (DeFlorio-Barker et al., 2017). This estimate was developed using the direct costs of over-the-counter and prescription medications, visits to primary health care providers, emergency departments, and hospitals, and lost productivity from time away from work or leisure. The range is based on variation in assumptions of the value of leisure and medical costs associated with gastrointestinal illness. This estimate likely underestimates the true economic benefits of protecting swimmers from exposure to waters that contain organisms that indicate the presence of fecal contamination, as it does not include additional private and social costs associated with

morbidity, such as defensive expenditures, investigation costs, and pain and suffering. In addition, this estimate only considers the risks of sickness and cost of treatment; costs associated with mortality from waterborne pathogens are not considered.

Protecting public health and improving water quality through the proposed amendments provides positive economic benefit not only through avoiding the direct and indirect costs of preventable illnesses, but also by maintaining the robust economic value of industries centered around tourism, swimming, and other water-dependent primary contact recreational activities, which are vital to the New Jersey economy. According to the National Oceanic and Atmospheric Administration's (NOAA) Office for Coastal Management estimates using the American Community Survey, the leisure and hospitality sectors of New Jersey's coastal economy alone have a gross domestic product (GDP) of \$12.95 billion (in 2019 dollars).

Impacts to NJPDES Permittees

The proposed bacterial quality criteria are unlikely to result in additional monitoring or treatment costs among the majority of permittees and will not require additional entities to obtain permits. In preparing the proposed amendments, the Department reviewed Discharge Monitoring Report (DMR) data collected from 201 NJPDES domestic surface water, consolidated school, and industrial/commercial/thermal dischargers reporting bacterial concentrations on the DMRs from January 2017 to November 2019. These 201 dischargers represented the full range of active dischargers of treated sanitary waste in these categories during the chosen time period. Twenty-seven facilities reported enterococcus and 174 facilities reported *E. coli* in their DMRs. Four out of 27 facilities were discharging at levels above the current monthly geometric mean of enterococcus criteria. Five out of 27 facilities would have exceeded the proposed monthly

geometric mean for enterococcus. For freshwaters, 44 out of 174 facilities were discharging at levels above the current monthly geometric mean of *E. coli* criteria; this number would increase to 57 out of 174 facilities exceeding the proposed monthly geometric mean for *E. coli*. Entities discharging into waters designated for primary contact recreation at levels higher than the proposed bacterial quality criteria may have to adjust treatment or other operational procedures, in order to meet the proposed bacterial quality criteria.

A variety of bacteria treatment methods are in use by permittees throughout New Jersey. These include chlorination, ultraviolet (UV) disinfection, and peracetic acid (PAA). Chlorination as a method of bacterial treatment produces chlorine-produced oxidants (CPO), which are regulated substances with NJPDES permit limits. Permittees who increase chlorination as a means of meeting the proposed bacterial quality criteria may also have to perform additional treatment of the CPOs, incurring additional costs. According to the USEPA's 1999 guidance on chlorine disinfection, the total cost of chlorination is increased by approximately 30 to 50 percent with the addition of dechlorination processes (USEPA 1999). Chlorination costs depend on treatment plant size, flow, and the option to use hypochlorite or chlorine gas as disinfection agents. One example of a treatment plant at peak wet weather flow of 2.25 MGD dosing to five mg/L of chlorine incurred \$1,906,413 (in 2019 dollars) in total annual costs, including dechlorination and operation costs; when increasing dosage to 10 mg/L of chlorine, \$2,131,393 (in 2019 dollars) in total annual costs were incurred (Darby, J. et al. 1995).

UV and PAA disinfection methods have their limitations. For example, UV disinfection may be limited in its effectiveness if colloids or total suspended solids are present in the effluent. These issues are addressed by wastewater treatment plants using UV for disinfection through use of settling or filtration. There are few permittees who use PAA for disinfection at this time,

although effluent data results are promising. Generally, there are limited compliance issues with bacteria limits for sewage treatment plants that are properly operated and maintained.

Adoption of the proposed amendments will not automatically require permittees to increase chlorination; those permittees already operating below the current bacterial quality criteria may not have to perform additional bacterial treatment in order to meet slightly stricter criteria.

As an example of how the statistical threshold value may impact the permittees, for those permittees reporting less than 10 samples within their reporting period pursuant to N.J.A.C. 7:14A-14.2, the statistical threshold value will act as a single sample maximum. For those permittees reporting less than 10 samples during their reporting period, but who determine that 10 or more samples may produce a more representative bacterial quality criteria assessment, the permittee may choose to conduct additional sampling, as a larger dataset enhances confidence in the assessment results and determination of compliance. However, any additional sampling beyond a permittee's requirements at N.J.A.C. 7:14A-14.2 Table 14-4 would be at the discretion of the individual permittee, and the cost would depend on site-specific factors, such as the location of the discharge, the number and type of substances being analyzed, the need to contract for laboratory analysis, and the need to hire an environmental consultant to fulfill any additional permitting requirements.

Impacts to Water Uses

Businesses dependent on primary contact recreation are likely to have a positive economic impact by the bacterial quality criteria updates because it will result in improved water quality and increased protection of public health. This proposed rulemaking updates the SWQS bacterial quality criteria, which is a separate standard from that established in the Public Recreational

Bathing rule at N.J.A.C. 8:26 and does not affect current New Jersey Department of Health (DOH) rules governing swimming advisories or beach closures. Therefore, there is no potential for additional advisories or beach closures as a result of the proposed amendments at N.J.A.C. 7:9B. Recreational beaches are subject to the opening and closing procedures at N.J.A.C. 8:26, which requires that the concentration of enterococcus in recreational bathing beaches not exceed a geometric mean of 30 cfu/100 ml and a water quality standard of 104 cfu/100 ml. The geometric mean threshold at N.J.A.C. 8:26 matches the Department's proposed geometric mean for enterococcus, and the DOH's water quality standard (single sample maximum of 104 cfu/100 ml) is more stringent than the proposed statistical threshold value of 110 cfu/100 ml in recreational bathing waters. It should be noted that the DOH is responsible for setting sanitary and safety rules for public recreational bathing beaches.

Freshwater Ammonia Criteria

Impacts to Freshwater Aquatic Life

The proposed freshwater ammonia criteria will protect New Jersey's aquatic communities more comprehensively than the existing criteria, thus advancing the State's policy to restore, enhance, and maintain the chemical, physical, and biological integrity of its waters, to protect public health, to safeguard fish and aquatic life and scenic and ecological values, and to enhance the domestic, municipal, recreational, industrial, and other uses of water. Protection of New Jersey's aquatic communities provides significant economic benefits.

New Jersey's recreational freshwater fisheries depend on aquatic food webs that support commercially valuable species, such as trout, which feed on a variety of aquatic insects, crustaceans, mollusks, and other invertebrates. Aquatic life criteria that adequately protect the

entire aquatic community from ammonia toxicity help to ensure the survival of these organisms and the commercially valuable fisheries that depend on them.

The proposed criteria will be more protective of the aquatic community than existing criteria. Protecting New Jersey's freshwater aquatic communities has robust direct and indirect economic benefits associated with the recreational economy, particularly the sport fishing sub-sector, as discussed in the Benefits Associated with Bacterial Quality Criteria section. The scale value of recreational freshwater fishing in New Jersey's economy should not be understated. In 2019, 118,633 New Jerseyans purchased freshwater fishing licenses. In addition, New Jersey's waters attracted an additional 14,306 non-residential permit purchasers. Healthy aquatic ecosystems also support other recreational activities, such as hunting and water-dependent sports. These fishers, hunters, and water-dependent recreators have a direct and significant impact on the State's economy. In September 2019, the U.S. Bureau of Economic Analysis (BEA) released prototype state-level data for the Outdoor Recreation Satellite Account which "measures the economic activity as well as the sales or receipts generated by outdoor recreational activities [and] each industry's production of outdoor goods and services and its contribution to U.S. GDP" (BEA, 2019). The BEA estimates that Boating/Fishing activities added \$601 million dollars (in 2019 dollars) to the State economy. It should be noted that this figure includes recreational boating and fishing activity across all of New Jersey, not just the water impacted by the rulemaking.

However, this estimate also does not include a valuation of the utility roughly equivalent to the enjoyment recreators gain from their activity. For example, a fisher may pay \$22.50 for a permit and \$5.00 for bait, but they value the time spent fishing more than \$27.50. A 2017 report prepared by Stockton University for New Jersey Division of Fish and Wildlife found fishers would be willing to pay \$13.59 (in 2019 dollars) beyond their direct costs per year to fish in Wildlife

Management Areas in the State (Tredick, et al., 2018). If we assume a similar level of utility generated by fishing across waters Statewide, in 2019 recreational fishing generated a lower-bound estimate of \$1.641 million in additional utility. This total utility or consumer surplus is likely higher since many fishers likely fished more than once in 2019.

In addition to protecting valuable freshwater fisheries, the proposed ammonia criteria advance the protection of ecosystem services that provide an economic benefit to the State and its residents. As explained in the Summary above, the proposed ammonia criteria take into account new ammonia toxicity data for, among other organisms, several species of mussels in the family Unionidae (unionid mussels). The ability of freshwater mussels to filter pollutants out of the water column is well established in the scientific literature, and while actual water filtration rates vary according to mussel species, community composition, and environmental factors, significant evidence exists that freshwater mussels' water filtration capacities can improve water quality without human treatment (Vaughn, 2017). For example, one study estimated that mussels in a 480-kilometer reach of the Mississippi River filter approximately 53 million cubic meters of water per day (Newton, 2011). It is in the economic interest of the State and its residents to implement aquatic life criteria that maintain and enhance the services provided by adequately protected aquatic communities.

Impacts to NJPDES Permittees

The costs of complying with the proposed freshwater ammonia criteria will be borne largely by domestic surface water permittees and will vary on a facility-specific basis. As discussed in the notice of proposal Summary above, the proposed freshwater ammonia criteria are temperature and pH-dependent, and, thus, the effluent limits are reflective of site-specific values.

As a result, the potential costs to NJPDES permittees will vary by treatment plant and the waterbody to which a permittee is discharging. Since the proposed freshwater ammonia criteria are not applicable to saline waters (SC and SE waters) and waters within the Pinelands (PL) region due to naturally occurring low pH values, permittees to pinelands, coastal, and saline waters are unaffected.

The proposed ammonia criteria for freshwaters would be potentially more stringent than the existing criteria at higher temperatures, which may require some permittees to perform additional treatment for ammonia. Furthermore, the temperature and pH-specific ammonia criterion become enforceable limitations in NJPDES permits only when the receiving waterbody is impaired for total ammonia; in all other cases, permittees discharging ammonia to freshwater have enforceable effluent limits set through WQBELs.

Existing ammonia limitations as imposed by the NJPDES Program can be either toxicity-based or dissolved oxygen-based (DO-based). Thus, current ammonia effluent limitations can be based on the 2,000 ammonia toxicity criteria, calculated to address dissolved oxygen (DO) impairments (Biochemical Oxygen Demand (BOD) related impairments), or existing ammonia limitations that have been carried over due to anti-backsliding provisions. In New Jersey, approximately 42 percent of NJPDES permittees with existing ammonia limits have at least one seasonal DO-based ammonia limitation and approximately 58 percent have year-round, toxicity-based ammonia limitations.

WQBELs for ammonia derived to address BOD-related impairments are warranted when the receiving waterbody is impaired for DO. Biochemical oxygen demand is a measure of the dissolved oxygen (DO) consumed by organisms during cellular respiration in water; components contributing to BOD include readily biodegradable organic carbon (carbonaceous, CBOD) and

ammonia (nitrogenous, NBOD) (Penn et al., 2006). The WQBEL for ammonia derived to address BOD-related impairments is usually based on water quality studies, and typically result in more stringent effluent thresholds (WQBELs) when compared with toxicity-based WQBELs for ammonia based on the existing or proposed criteria.

The Department compared the potential summer and winter WQBELs based on the proposed freshwater ammonia criteria with the toxicity-based WQBELs calculated using existing freshwater ammonia criteria for a subset of 78 NJPDES permittees. The evaluation included permittees in the Passaic River and Raritan River watersheds, which are some of the largest watersheds in New Jersey. The Passaic River watershed, in particular, is effluent-dominated under low flow conditions and has a number of potable water intakes. Additional treatment of ammonia in the effluent of permittees discharging to the Passaic River may result in an increase of the in-stream nitrate concentration.

The comparison analysis demonstrated that the proposed freshwater ammonia criteria will most often result in more stringent WQBELs, particularly in the summer months, when compared to the existing toxicity-based, freshwater ammonia criteria developed by New Jersey, if there is cause to exceed the criteria. It is important to note that many NJPDES permit limits are not toxicity-based since existing limits are often retained pursuant to N.J.A.C. 7:14A-13.19, anti-backsliding policies, and other limits as described below.

However, the proposed freshwater ammonia criteria will have limited impact on those NJPDES permittees who rely on DO-based WQBELs. Currently, approximately 47 of 78 NJPDES-permitted facilities in the Passaic River watershed have at least one BOD-related (DO-based) WQBEL and are relatively less likely to be impacted by the proposed freshwater ammonia criteria. Some facilities use a BOD-related, DO-based WQBEL in the summer and a toxicity-based

WQBEL in the winter, and may, therefore, experience some impacts due to the proposed freshwater ammonia criteria. Thus, in most instances the existing DO-based WQBEL is already more stringent than the proposed toxicity-based, criteria-derived WQBEL, and permittees are less likely to be impacted by the proposed rule.

The magnitude of economic impacts associated with the proposed freshwater ammonia criteria is, therefore, largely determined by the factors required to develop ammonia toxicity or BOD-related, DO-based WQBELs. WQBELs are derived using several factors other than the applicable water quality criterion, including the volume of wastewater discharged as effluent, the pollutant-specific concentration in the effluent, the receiving water's flow rates, the pollutant-specific upstream concentration, the applicable design flow of the receiving waterbody specified at N.J.A.C. 7:9B-1.5(c)2, and the applicable averaging periods as specified at N.J.A.C. 7:9B-1.14.

In summary, the Department's evaluation of the impacts of the proposed freshwater ammonia criteria based primarily on the NJPDES Category A domestic sanitary permittees indicates typically lower toxicity-based ammonia WQBELs derived using the proposed freshwater ammonia criteria when compared with the existing toxicity-based criteria. However, since a portion of permittees are already using DO-based limits, they are often already achieving more stringent effluent limits. This variability can be explained by the fact that multiple site-specific parameters besides the ammonia criteria are used in calculating ammonia effluent limits, including discharge volume, available dilution in the receiving stream, effluent and stream pH, effluent and stream temperature, and alkalinity.

The treatment of ammonia generally includes the addition of methanol, prolonged sand or deep-bed filtration, membrane bioreactors, and modifying biological nutrient removal (BNR) processes, such as the Four-Stage Bardenpho process, and the Modified Ludzack-Ettinger (MLE)

process (Washington Department of Ecology, 2011). These treatment options do not represent the scope of all potential technologies available to treat ammonia, but are some of the common configurations for removal. Further reduction of nitrate to nitrogen gas (denitrification) can be accomplished by using nitrate-reducing (denitrifying) bacteria to convert nitrate to nitric oxide, nitrous oxide, and finally, nitrogen gas. Sanitary permittees using a chemical oxidation method to meet more stringent ammonia limits based on the proposed criteria will also need to maintain compliance with all relevant limits for nitrate discharges to surface water, which may or may not present additional treatment costs, depending on site- and facility-specific attributes. For example, while the existing nitrate criterion of 10 mg/L is applicable to all FW2 waters, permittees to a FW2 water upstream of drinking water intakes may have to perform additional treatment, dilution, or other operational modifications to comply with applicable nitrate limits while treating for ammonia.

The Department estimates costs for sanitary permittees performing additional treatment for ammonia reduction as follows. First, methanol is typically added as a carbon donor at the denitrification stage of typical BNR processes; in April 2020, methanol was priced in North America at approximately \$1.08 per gallon by the Methanex Corporation (Methanex Corporation, 2020), with a rate of 0.49 gallons of methanol typically used per pound of nitrate-nitrogen denitrified (Methanol Institute, 2015). The cost of installing deep-bed filtration in existing BNR processes can range from approximately \$178,000 to \$263,000 (in 2019 dollars), depending on facility size (USEPA, 2007).

Regarding membrane bioreactors, one case study of all municipal wastewater treatment plants in Washington State estimated the annual capital, operation, and maintenance costs of using membrane bioreactors to achieve year-round Total Inorganic Nitrogen (TIN) concentrations of

less than eight milligrams per liter (mg/L) to be approximately \$2.3 million (in 2019 dollars) (Washington Department of Ecology, 2011). For reference, TIN is comprised of Total Ammonia as Nitrogen (TAN), nitrite, and nitrate; this study did not center solely on ammonia removal. Large plants with extra capacity may wish to modify a Four-Stage Bardenpho process and opt for adding an anaerobic tank to the beginning of the system. For small plants with an existing Modified Ludzack-Ettinger (MLE) process (4,000 gpd to 100,000 gpd), upgrades may include adding an anoxic basin, adding recirculating pumping from aeration basins to the new anoxic basin, adding deep-bed denitrification filters, and/or extending the Solids Retention Time to 14 days for additional conversion of ammonia to nitrate. According to the design capacity of each plant, the costs of installing such anoxic basins range from \$35,000 to \$99,000 (in 2019 dollars). Subsequent costs of operation and maintenance range from \$18,000 to \$26,000 (in 2019 dollars) based on the design capacity of the plant (USEPA, 2007).

Additionally, the potential economic impact of updated water quality criteria to permittees is determined by the amount of treatment capacity that remains at each discharging facility. In facilities where there is remaining treatment capacity, a permittee may be able to adjust operations and optimize existing units to meet more stringent limitations without significant additional cost. If additional treatment capacity is not available, however, facility upgrades, such as those described above may be needed, which could represent significant additional cost. Generally, it has been found that as plant size increases, the average capital costs per unit of additional nitrogen removal using biological nutrient removal decreases, as larger plants most often have capacity left for treatment (USEPA, 2007).

In the USEPA's guidance on BNR removal, various case studies are offered showing the relationship between plant size and the average costs for installing additional BNR removal

technologies. One case study of a facility upgrading its treatment processes for BNR removal involved a Maryland wastewater treatment plant with a design flow of 15 million gallons per day (MGD). In May 2002, the capital cost of retrofitting the facility with an MLE process was \$11,466,657 in 2006 dollars. In another case study from 2000, a Connecticut wastewater treatment plant with a design flow of 3.03 MGD spent \$3,513,514 to retrofit with an MLE process. For facilities wishing to retrofit with Four-Stage Bardenpho processes, the following case studies apply: an upgrade was completed in August 2006 for a Maryland treatment plant of 2.0 MGD for \$5,200,000; additionally, a Connecticut treatment plant of 2.0 MGD had a Four-Stage Bardenpho process installed for \$14,235,676 in 2003 (USEPA, 2007). Table 7 below shows a breakdown of the case studies by treatment process. For more examples of wastewater treatment plants retrofitting plants for BNR, the USEPA has provided a cost breakdown for various design capacities in its June 2007 fact sheet, found at <https://www.nj.gov/dep/wms/bears/docs/EPA%20-Biologic1%20nutrient%20removal%20processes&costs.pdf>.

Table 7. BNR Retrofit Costs for Wastewater Treatment Plants in Maryland and Connecticut

| Existing Treatment Process | State | Facility Name | Design Capacity (MGD) | Completion Date | Total Capital BNR Cost (in 2019 dollars) |
|-----------------------------------|--------------|------------------------------|------------------------------|------------------------|---|
| Modified Ludzack-Ettinger | Maryland | Cox Creek | 15 | 2002 | \$14,541,325 |
| | Connecticut | Derby (TN limit of 6-8 mg/L) | 3.03 | 2000 | \$5,216,344 |
| Four-Stage Bardenpho | Maryland | Hurlock | 2.0 | 2006 | \$6,594,327 |
| | Connecticut | Fairfield Phase 2 | 9 | 2003 | \$19,779,621 |

As explained above, the Department is proposing new N.J.A.C. 7:9B-1.5(c)10, which indicates that if a permittee demonstrates to the satisfaction of the Department that an alternative criterion is applicable in place of the freshwater total ammonia criteria specified at N.J.A.C. 7:9B-1.14(e)2, the Department may adopt an alternative criterion for that permittee. The alternative criterion recalculation procedures are laid out at Appendix N of the USEPA's 2013 Aquatic Life Ambient Water Quality Criteria for Ammonia – Freshwater (USEPA, 2013). Permittees wishing to calculate a site-specific criterion are responsible for surveying the aquatic community in the receiving waterbody to demonstrate the absence of aquatic species whose toxicity data the permittee proposes to exclude from the criterion derivation.

Based on the information submitted to the Department by the permittee, if the Department determines absence of a species that was included in the freshwater ammonia criteria derivation, the permittee must provide all the supporting documentation and technical reports to the Department for a site-specific alternative criterion evaluation. The cost to permittees that choose to pursue a site-specific alternative criterion is, therefore, composed largely of personnel time spent on aquatic community surveys, data analysis, criterion derivation, and preparation and submission of technical reports, or the cost of contracting out these tasks to third-party entities, such as environmental consulting firms. Site-specific criterion derivation is often a costly process, but is not required, and is generally pursued by permittees only if deemed to be more economical than compliance with the Statewide criteria.

Water Quality Standards Variances

The proposed new WQS variance provisions will not have any immediate economic impact. The provisions would provide a pathway for the Department to adopt a WQS variance

through subsequent rulemaking to accomplish incremental improvements in achieving SWQS criteria. Such a pathway provides an alternative to permittees remaining in violation of certain criteria in the absence of adequate treatment technology costs, or when the SWQS cannot be met due to one or more of the conditions listed at 40 CFR 131.10(g).

Potential Future Benefits Associated with WQS variances

Cost savings could occur for permittees that apply for WQS variances, as a variance could be a means to addressing contested permit limits instead of accruing penalty violations. When the SWQS cannot be met for any of the six conditions outlined at 40 CFR 131.10(g) and N.J.A.C. 7:9B-1.16(b)4, current regulations offer no options for the permittee other than incurring potential permit violations or enforcement actions, while the water quality of receiving waters continues to degrade. This creates considerable operational and financial uncertainty with respect to the cost of compliance and need for treatment upgrades. Examples of a regulatory compliance issue that creates an uncertainty for permittees include standards for certain pollutants, such as arsenic, that may be lower than natural ambient conditions, or lower than what existing technologies can feasibly measure or treat. The use of a WQS variance to formally pursue incremental improvements in water quality towards attainment of the SWQS in collaboration with the Department creates a regulatory path forward towards compliance with SWQS where none previously existed. The Department expects a variety of economic benefits from having a tool, such as a WQS variance available to facilitate implementation of the State's SWQS. Achieving incremental progress towards compliance with SWQS criteria, which are designed to protect aquatic life and human health, may result in the availability of safer drinking water sources and greater recreational opportunities. Other economic benefits include water quality being made

suitable for agricultural and industrial uses, and water quality that supports the commercial fishing industry and may increase property values.

Potential Future Costs Associated with WQS variance

The new requirements to incorporate WQS variance provisions will allow the Department to adopt temporary in-stream criteria or effluent conditions that will provide significant economic relief to permittees facing currently unattainable SWQS, although there may be some upfront costs associated with the preparation of the documentation necessary for WQS variance submittal. The Department will be responsible for compiling the WQS variance package and promulgating the WQS variance in the SWQS at N.J.A.C. 7:9B. It is possible the USEPA may not approve the adopted SWQS, in which case the WQS variance would not be implementable and the permittee must comply with its existing permit limits.

As proposed at N.J.A.C. 7:9B-1.16(b)4, permittees must demonstrate that current WQS cannot be met due to one or more of six conditions. The cost of preparing this documentation will be site-specific, as each permittee seeking a WQS variance will have a unique facility layout, a unique reason as to why a parameter's criterion cannot be met, and a unique receiving waterbody. Once an applicant provides this documentation to the satisfaction of the Department, it will begin an open, transparent process in which site-specific costs will be outlined.

The Department cannot currently estimate the potential administrative costs to Department staff in developing, approving, and periodically reviewing WQS variance. The USEPA's 2015 revisions to the Federal Water Quality Standards stated that potential administrative costs to states and authorized tribes reviewing WQS variance were estimated to a national total of \$2.79 to \$12.54

million adjusted to 2019 dollars (see 80 FR 51,044). The Department does not anticipate the need for any additional full-time employees as a result of the new WQS variance provisions at this time.

An adopted and approved WQS variance for a specific substance will be time-limited and require incremental improvements in water quality over the term of the WQS variance, requiring certain expenditures on the part of the WQS variance recipient. The proposed WQS variance provisions may be helpful in determining WQS variances for substances, such as arsenic, PCBs, and ammonia, where the criteria are more stringent than the ambient conditions or technologically infeasible.

Environmental Impact

The proposed amendments to the SWQS will have a positive environmental impact by providing appropriate levels of protection for human health, aquatic biota, and ecological systems associated with the State's waters. These proposed amendments represent the Department's continuing efforts to restore, maintain, and enhance the chemical, physical, and biological integrity of New Jersey's waters.

The proposed amendments to bacterial quality criteria and ammonia criteria at N.J.A.C. 7:9B-1.14 are based on updated information and, therefore, are more appropriate for water quality protection. Permits based on proposed criteria will ensure that the designated uses are further protected.

As explained in the Summary above, the proposed freshwater ammonia criteria consider new ammonia toxicity data for several species of unionid mussels, thus better ensuring that ammonia-sensitive mussel species are adequately protected under the Department's aquatic life criteria. Per the USEPA's 2013 Aquatic Life Ambient Water Quality Criteria for Ammonia,

“approximately one-quarter of nearly 300 freshwater unionid mussel taxa in the country are Federally listed as endangered, threatened or of special concern.” New Jersey is home to 11 native freshwater unionid mussels, including the Federally endangered dwarf wedgemussel (*Alasmidonta heterodon*) and three Federal species of special concern: the brook floater (*Alasmidonta varicosa*), green floater (*Lasmigona subviridis*) and yellow lampmussel (*Lampsilis cariosa*). Pursuant to N.J.A.C. 7:9B-1.5(d)1i, the maintenance, migration, and propagation of threatened or endangered species, as defined at the Federal Endangered Species Act of 1973, as amended, 16 U.S.C. §§ 1531 et seq., and/or the New Jersey Endangered and Nongame Species Conservation Act, N.J.S.A. 23:2A-1 et seq., is considered an existing use that must be maintained. By proposing aquatic life criteria that take into account the effect of ammonia toxicity on several threatened and endangered unionid mussels, the Department is ensuring that this existing use is maintained. The incorporation of toxicity data for other highly sensitive species, such as gill-breathing snails, in the criteria, ensures that the entire aquatic community is adequately protected by the proposed criteria.

The proposed freshwater ammonia criteria will apply throughout the State, except in the Pinelands, for which the Department previously adopted freshwater ammonia criteria on January 22, 2002 (see 34 N.J.R. 537(a)). As specified in the SWQS at N.J.A.C. 7:9B-1.14(b)1ii, the pH level in Pinelands waters must be maintained between 3.5 and 5.5. The 2013 USEPA freshwater ammonia criteria are applicable for pH values between 6.5 and 9.5. Accordingly, the Department has determined that the 2013 USEPA freshwater ammonia criteria will not apply to Pinelands waters.

The proposed WQS variance policies at N.J.A.C. 7:9B-1.16 will establish requirements to develop a WQS variance that will encourage sustained progress towards meeting pollutant criteria

designed to protect designated and existing uses where one of the six factors listed is not met. For example, the removal of arsenic from municipal wastewater below 2.0 µg/L using conventional technologies, such as coagulation, sedimentation, filtration, and adsorption may be currently difficult to achieve. The Department anticipates that its proposed WQS variance process will facilitate the identification of methods to achieve the maximum removal possible using conventional technologies.

Federal Standards Analysis

N.J.S.A. 52:14B-1 et seq., requires that State agencies that adopt, readopt, or amend State regulations that exceed any Federal standards or requirements include in the rulemaking document a Federal standards analysis.

The Federal Act, 33 U.S.C. §§ 1251 et seq., as amended by the Water Quality Act of 1987 (PL 100-4) requires the establishment of water quality standards for all surface waters of the United States. (The Water Quality Act of 1987 amended the Federal Act to require the adoption of criteria for toxic pollutants identified as causing or contributing to an impairment of a waterbody's designated use(s).) Individual states are given primary responsibility for developing and adopting SWQS applicable to their waters. The USEPA is responsible for overseeing and approving state water quality standards, providing guidance on the content of the standards, and developing water quality criteria guidance documents.

Key elements of the Department's SWQS program that are required pursuant to the Federal Act are: a classification system establishing designated beneficial uses of the waters; ambient water quality criteria necessary to protect those uses; minimum uses to be attained, which reflect the fishable and swimmable goals of the Federal Act; and antidegradation policies and implementation

procedures to prevent water quality from deteriorating. Furthermore, the Federal Act includes provisions that require the USEPA to promulgate superseding Federal standards where the USEPA concludes that a state's standards are not consistent with the requirements of the Federal Act, or where Federal requirements are necessary to meet the requirements of the Federal Act.

The proposed amendments to the SWQS are required by and consistent with the Federal statutes, regulations, and guidance.

N.J.A.C. 7:9B-1.4 contains definitions of terms used within the SWQS. The majority of these definitions are identical to those used by the USEPA in either the Federal water quality standards regulation at 40 CFR 131.3 or in the glossary of the USEPA's guidance document for states, the *Water Quality Standards Handbook: Second Edition* (November 2017, EPA-823-B-94-005a).

N.J.A.C. 7:9B-1.5 establishes the policies applicable to the protection and enhancement of surface water resources throughout the State. These include general, interstate waters, general technical (including mixing zone policies), antidegradation, water quality-based effluent limitation, whole effluent toxicity requirements, and nutrient policies. The general policies and interstate waters policies at N.J.A.C. 7:9B-1.5(a) and (b) are either exempt from Federal standards, or identical to language found in the Federal Water Quality Standards Regulations (see 40 CFR 131). The proposed revisions to N.J.A.C. 7:9B-1.5(c) are consistent with the Federal requirements and, therefore, no further analysis is required.

N.J.A.C. 7:9B-1.14 contains the surface water aquatic life and human health protection criteria (both narrative statements and numerical values) for waters classified as PL, FW2, SE, and SC. New Jersey has adopted criteria for pollutants to protect the aquatic biota and humans from detrimental effects from exposure to these pollutants in surface waters of the State. N.J.A.C. 7:9B-

1.14 also states that the surface water criteria for the Delaware River and Bay are as contained in the Delaware River Basin Commission regulations. The Federal Regulations at 40 CFR 131.11(a)(1) require states to adopt water quality criteria that protect the designated uses. Pursuant to 40 CFR 131.11(b)(1)(i)-(iii), states should establish numerical values based on Federal Act section 304(a) guidance or 304(a) guidance modified to reflect site-specific conditions.

The proposed bacterial quality criteria are based on the USEPA's recommended 2012 RWQC, which rely on the latest research and science, including studies that show a link between illness and fecal contamination in recreational waters. The proposed criteria are based on the USEPA recommendations and, therefore, no further analysis is required.

The proposed amendments to freshwater ammonia criteria are based on the USEPA 2013 recommendations. The target sensitive species that were used for ammonia criteria development are present in the waters of New Jersey. Therefore, no further analysis is required.

Proposed new N.J.A.C. 7:9B-1.16, regarding WQS variances, is consistent with the Federal Regulations at 40 CFR 131.14. Thus, no further analysis is required.

Jobs Impact

The Department evaluated this rulemaking to determine the impact of the proposed amendments to the SWQS on job creation or retention in the State pursuant to N.J.S.A. 52:14B-1 et seq. (P.L. 1995, c. 166). The Department anticipates that the proposed amendments and new WQSV provisions will potentially create jobs and increase employment opportunities.

The implementation of the SWQS will continue to result in job opportunities in analytical and environmental consulting services to evaluate and design the most cost-effective abatement measures to achieve compliance with the proposed bacterial and ammonia criteria. If such

abatement measures involve new capital improvements, then job opportunities related to construction, contracting services, operation, and maintenance of these improvements would be created. The proposed amendments regarding WQS variances may generate additional jobs related to consulting, engineering, monitoring, and reporting. Implementation of the SWQS will result in more of the State's waters achieving designated uses, which is likely to create new jobs in water-related business, such as shellfish harvesting, recreational fishing, commercial fishing, and ecotourism. Failure to implement the proposed amendments and new rule could result in lost employment opportunities in businesses and industries that are water quality dependent, such as tourism and fishing.

Agricultural Industry Impact

In accordance with N.J.S.A. 52:14B-4(a)2 and P.L. 1998, c. 48, adopted on July 2, 1998, the Department has reviewed the proposed amendments and new rules to determine the nature and extent of the impacts of the proposed rules on the agricultural industry. The agricultural industry is not subject to the SWQS, unless the operation is required to obtain an NJPDES permit pursuant to N.J.A.C. 7:14A. Farms that operate a food processing operation or conduct other activities that discharge to surface water are required to obtain a NJPDES permit, unless the discharge activity is exempt pursuant to N.J.A.C. 7:14A-2.5. Farms that operate a NJPDES regulated discharge already incur costs to comply with their NJPDES permit including permit fees, laboratory costs for sample analysis, and potential costs for engineering services. The total costs imposed will depend on the requirements established in the facility's individual permit, which are based on the nature of the operation, the location of the discharge, and the volume and type of pollutants discharged.

In addition, farms that operate a concentrated animal feeding operation (CAFO) as described at N.J.A.C. 7:14A-2.13 are required to obtain a NJPDES permit if they discharge to surface water or groundwater. Farms that operate such CAFOs will also incur costs to comply with proposed amendments, as incorporated in the NJPDES permit condition. The cost of complying with NJPDES permit conditions for CAFOs is variable and depends on several factors, including number and type of animals confined, existing animal waste practices at the farm, and availability of cropland and pastureland for manure application.

Regulatory Flexibility Analysis

As required pursuant to the New Jersey Regulatory Flexibility Act, N.J.S.A. 52:14B-16 et seq., the Department has evaluated the reporting, recordkeeping, and other compliance requirements that the proposed amendments to the SWQS would impose on small businesses. The Regulatory Flexibility Act defines the term "small business" as any business that is a resident in the State, is independently owned and operated and not dominant in its field, and employs fewer than 100 full-time employees.

The Department has determined that the proposed amendments could impact any small businesses engaging in activities that affect the quality or uses of the surface waters of the State through pollutant discharges. As stated in the Economic Impact statement above, the initial costs of compliance for water quality sampling, analysis, and reporting may increase for small businesses to comply with their NJPDES permits. Continued costs may include those associated with hiring professional services to design treatment facilities or other measures necessary to comply with the NJPDES permits. For example, a business may hire licensed professional engineers to design best management practices for compliance with the SWQS.

The capital and annual compliance costs to small businesses could vary depending on a range of factors, such as type of activity, classification of the waterbody affected, existing abatement methods, and required levels of pollutant reduction. In proposing this rulemaking, the Department has balanced the expected economic impacts of the rules upon small businesses against the need to protect the environment and public health while complying with Federal law. The Department has determined that any attempt to relax the requirements for small businesses would endanger safety, public health, and the environment. Therefore, no exemption from the rulemaking is specifically provided for small businesses.

Housing Affordability Impact Analysis

In accordance with N.J.S.A. 52:14B-4, as amended effective July 17, 2008, by P.L. 2008, c. 46, the Department has evaluated the proposed amendments and new rule at N.J.A.C. 7:9B for purposes of determining their impact, if any, on the affordability of housing. The Federal Act, 33 U.S.C. §§ 1251 et seq., as amended by the Water Quality Act of 1987 (PL 100-4) requires states to establish water quality standards for all surface waters. These standards are the Federal standards for the purposes of implementing the Federal Act programs. In the absence of state adopted water quality standards, the USEPA would propose and adopt standards applicable to New Jersey.

The Department does not anticipate that the proposed amendments or new rule will have an impact on the affordability of housing because it is extremely unlikely that the amendments will evoke a major change in the average costs associated with housing.

Smart Growth Development Impact Analysis

In accordance with N.J.S.A. 52:14B-4, as amended effective July 17, 2008, by P.L. 2008, c. 46, the Department has evaluated the proposed amendments and new rule, to determine the impact, if any, on housing production in Planning Areas 1 and 2, or within designated centers, under the State Development and Redevelopment Plan. The proposed amendments and new rule, however, are not anticipated to have an overall impact on housing.

Racial and Ethnic Community Criminal Justice and Public Safety Impact

The Department has evaluated this rulemaking and determined that it will not have an impact on pretrial detention, sentencing, probation, or parole policies concerning adults and juveniles in the State. Accordingly, no further analysis is required.

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Full text of the proposal follows (additions indicated in boldface **thus**; deletions indicated in brackets [thus]):

CHAPTER 9B

SURFACE WATER QUALITY STANDARDS

SUBCHAPTER 1. SURFACE WATER QUALITY STANDARDS

7:9B-1.1 Scope of subchapter

Unless otherwise provided by rule or statute, this subchapter shall constitute the rules of the Department of Environmental Protection governing matters of policy with respect to the protection and enhancement of surface water resources, class definitions, [and] quality criteria, use designation, and quality criteria for the mainstem of the Delaware River, including the Delaware Bay, the classification of surface waters of the State, procedures for establishing water quality-based effluent limitations, modification of water quality-based effluent limitations, procedures for reclassifying specific segments for less restrictive uses, [and] procedures for reclassifying specific segments for more restrictive uses, **and procedures for establishing water quality standards variances**, pursuant to N.J.S.A. 13:1D-1 et seq., the New Jersey Water Pollution Control Act, [N.J.S.A.] 58:10A-1 et seq., and the Water Quality Planning Act, [N.J.S.A.] 58:11A-1 et seq.

7:9B-1.4 Definitions

The following words and terms, when used in this subchapter, shall have the following meanings, unless the context clearly indicates otherwise.

...

[“Aquatic substrata” means soil material and associated biota underlying the water.]

...

_____ **“Discharge” has the same meaning as the term defined in the New Jersey Pollutant Discharge Elimination System rules at N.J.A.C. 7:14A-1.2.**

“Discharger” has the same meaning as the term defined in the New Jersey Pollutant Discharge Elimination System rules at N.J.A.C. 7:14A-1.2.

...

“DRBC Water Quality Regulations” means the DRBC Administrative Manual – Part III Water Quality Regulations [dated September 27, 2006,] including all amendments and supplements thereto.

...

[“NPDES” means National Pollutant Discharge Elimination System.]

...

“New discharger” has the same meaning as the term defined in the New Jersey Pollutant Discharge Elimination System rules at N.J.A.C. 7:14A-1.2.

...

“Permittee” has the same meaning as the term defined in the New Jersey Pollutant Discharge Elimination System rules at N.J.A.C. 7:14A-1.2.

...

“Pollutant Minimization Program” or “PMP” means a structured set of activities including an implementation schedule to improve processes and pollutant controls that will prevent and reduce pollutant loadings. For the purposes of any such PMP, pollutant shall refer to any substance as specified at N.J.A.C. 7:9B-1.14.

...

“Statistical Threshold Value” or “STV” means the value that approximates the 90th percentile of the water quality distribution and is not exceeded by more than 10 percent of the samples used to calculate the geometric mean for the purposes of bacterial quality criteria pursuant to N.J.A.C. 7:9B-1.14(d)1ii.

...

“Thermal discharge” has the same meaning as the term defined in the Pollutant Discharge Elimination System rules at N.J.A.C. 7:14A-1.

...

“Water Quality Standards variance” or “WQS variance” means a time-limited designated use and criterion for a specific pollutant or pollutants that reflect the highest attainable condition during the term of the WQS variance. For the purposes of any such WQS variance, pollutant shall refer to any substance, as specified at N.J.A.C. 7:9B-1.14.

...

[“Zone” means the general surface water classification applied to the mainstem Delaware River and Delaware Bay.]

7:9B-1.5 Statements of policy

(a)-(b) (No change.)

(c) General technical policies are, as follows:

1. – 6. (No change.)

7. The Department shall utilize a geometric mean to assess compliance with the bacterial quality indicators at N.J.A.C. 7:9B-1.14(d)1ii and iii. [The geometric mean shall be calculated using a minimum of five samples collected over a 30-day period.] The [single sample maximum shall be used for] **Department shall issue** beach notifications, in accordance with N.J.A.C. 8:26 [and to identify where additional ambient water quality sampling is needed to calculate a geometric mean].

8. The Department shall implement the geometric mean and statistical threshold values (STV), where applicable, for bacterial quality criteria established at N.J.A.C. 7:9B-1.14(d)1ii and iii, over a 30-day period in the NJPDES permits, in accordance with N.J.S.A. 58:10A-3 and N.J.A.C. 7:14A-13.15(a)2.

[8.] **9.** (No change in text.)

10. The Department may adopt an alternative freshwater total ammonia criterion pursuant to the Aquatic Life Ambient Water Quality Criteria For Ammonia – Freshwater 2013, EPA 822-R-13-001, April 2013, <https://www.epa.gov/sites/production/files/2015-08/documents/aquatic-life-ambient-water-quality-criteria-for-ammonia-freshwater-2013.pdf>, if a permittee demonstrates to the satisfaction of the Department, that an alternative criterion is applicable in place of the freshwater total ammonia criteria at N.J.A.C. 7:9B-1.14(e)2.

(d)-(h) (No change.)

7:9B-1.14 Surface water quality criteria

(a) – (c) (No change.)

(d) Surface water quality criteria for FW2, SE, and SC Waters:

N.J.A.C. 7:9B-1.14(d) General Surface Water Quality Criteria for FW2, SE, and SC Waters:

(Expressed as Maximum concentrations unless otherwise noted)

| <u>Substance</u> | <u>Criteria</u> | <u>Classifications</u> |
|--------------------------------------|--|------------------------|
| 1. Bacterial quality (Counts/100 ml) | <ul style="list-style-type: none">i. (No change.)ii. Primary Contact Recreation:<ul style="list-style-type: none">(1) Enterococci levels shall not exceed a geometric mean of SE1 and SC [35/100] 30/100 ml over a 90-day period, or a [single sample maximum] Statistical Threshold Value of [104/100] 110/100 ml, which shall not be greater than 10 percent excursion frequency over a 90-day period. | |

- (2) *E. Coli* levels shall not exceed a geometric mean of All FW2
[126/100] **100/100** ml over a **90-day period** or a [single
sample maximum] **Statistical Threshold Value** of
[235/100] **320/100** ml, **which shall not be greater than**
10 percent excursion frequency over a 90-day period.
- iii. (No change.)

2.-3. (No change.)

4. Nutrients

- i. (No change.)
- ii. Phosphorus (mg/L)*
- (1) Non Tidal Streams: Concentrations of total P shall not FW2
exceed 0.1 in any stream, unless **site-specific criteria or**
watershed-specific translators are established pursuant to
N.J.A.C. 7:9B-1.5(g)2 or if the Department determines

that concentrations do not render the waters unsuitable, in accordance with (d)4i above.

- (2) Lakes: Concentrations of total P shall not exceed 0.05 in FW2 any lake, pond, or reservoir, or in a tributary at the point where it enters such bodies of water, unless **site-specific criteria or** watershed-specific translators are developed pursuant to N.J.A.C. 7:9B-1.5(g)2 or if the Department determines that concentrations do not render the waters unsuitable, in accordance with (d)4i above.

5.-13. (No change.)

* See N.J.A.C. 7:9B-1.14(g) for site-specific criteria.

(e) Surface Water Quality Criteria for Ammonia are derived in accordance with the formulas set forth below. Acute criteria are expressed as three-hour average using MA1CD10 flow and chronic criteria are expressed as 30-day average using MA30CD10 flow. No exceedance of criteria shall be permitted at or above the design flows specified.

| <u>CAS Number</u> | <u>Criteria</u> | <u>Classification</u> |
|--|---|-----------------------|
| 1. Ammonia, 7664-41-7 [unionized] un-ionized (mg NH ₃ - N/L) | [(1) at pH < 8.30 $0.179 \cdot 10^{0.026(\text{Temp}-20) + 0.41 (\text{pH}-7.80)}_{(a)}$ $0.046 \cdot 10^{0.026(\text{Temp}-20) + 0.41 (\text{pH}-7.80)}_{(c)}$ at pH ≥ 8.30 $0.179 \cdot 10^{0.026(\text{Temp}-20) + 0.20}_{(a)}$ $0.046 \cdot 10^{0.026(\text{Temp}-20) + 0.20}_{(c)}$ | FW2-TP, FW2-TM |

(2) at pH < 8.30

FW2-NTJ

$$0.201 * 10^{0.026(\text{Temp}-20) + 0.41 (\text{pH}-7.80)}_{(a)} (\text{Summer}^1)$$

$$0.054 * 10^{0.026(\text{Temp}-20) + 0.41 (\text{pH}-7.80)}_{(c)} (\text{Summer}^1)$$

$$0.232 * 10^{0.026(\text{Temp}-20) + 0.41 (\text{pH}-7.80)}_{(a)} (\text{Winter}^2)$$

$$0.060 * 10^{0.026(\text{Temp}-20) + 0.41 (\text{pH}-7.80)}_{(c)} (\text{Winter}^2)$$

at pH ³ 8.30

$$0.201 * 10^{0.026(\text{Temp}-20) + 0.20}_{(a)} (\text{Summer}^1)$$

$$0.054 * 10^{0.026(\text{Temp}-20) + 0.20}_{(c)} (\text{Summer}^1)$$

$$0.232 * 10^{0.026(\text{Temp}-20) + 0.20}_{(a)} (\text{Winter}^2)$$

$$0.060 * 10^{0.026(\text{Temp}-20) + 0.20}_{(c)} (\text{Winter}^2)$$

[(3)] **i.** at pH < 8.30 PL

$$0.238 * 10^{0.026(\text{Temp}-20) + 0.41 (\text{pH}-7.80)}_{[(a)]} \text{ (acute)}$$

$$0.061 * 10^{0.026(\text{Temp}-20) + 0.41 (\text{pH}-7.80)}_{[(c)]} \text{ (chronic)}$$

[(4)] **ii.** 0.115[(a)] (acute); 0.030[(c)] (chronic) All SE

[(5)] **iii.** 0.094[(a)] (acute); 0.024[(c)] (chronic) SC

-
- [1. Summer spawning period from March 1st through October 31st.
 2. Winter non-spawning period from November 1st through February 28/29th.
- (a) Acute aquatic life protection criterion
 - (c) Chronic aquatic life protection criterion]
-

2. Ammonia, Total (mg TAN/L) - Acute criteria are expressed as one-hour average using MA1CD10 flow, chronic criteria are expressed as 30-day rolling average using MA30CD10 flow and the highest four-day average within the 30-day

averaging period should not be more than 2.5 times of chronic criteria. No exceedance of criteria shall be permitted at or above the design flows specified.

| Ammonia , total (mg TAN/L) | 7664-41-7 | Criteria applicable in FW2 waters | Classifications |
|----------------------------------|-----------|--|-------------------|
| | | i. $\text{MIN} \left(\left(\frac{0.275}{1+10^{7.204-pH}} + \frac{39.0}{1+10^{pH-7.204}} \right), \left(0.7249 \times \left(\frac{0.0114}{1+10^{7.204-pH}} + \frac{1.6181}{1+10^{pH-7.204}} \right) \times (23.12 \times 10^{0.036 \times (20-T)}) \right) \right)$ (acute) | FW2-TP, FW2-TM |
| | | ii. $0.7249 \times \left(\frac{0.0114}{1+10^{7.204-pH}} + \frac{1.6181}{1+10^{pH-7.204}} \right) \times \text{MIN}(51.93, 23.12 \times 10^{0.036 \times (20-T)})$ (acute) | FW2-NT |
| | | iii. $0.8876 \times \left(\frac{0.0278}{1+10^{7.688-pH}} + \frac{1.1994}{1+10^{pH-7.688}} \right) \times (2.126 \times 10^{0.028 \times (20-\text{MAX}(T,7))})$ (chronic) | All FW2 |

(f) (No change.)

(g) Site-specific surface water quality criteria listed below apply to specific waterbodies that supersede the Statewide criteria listed at (d) [through], (e), and (f) above. Any site-specific criterion developed through a Total Maximum Daily Load (TMDL) adopted as an amendment to **the Statewide Water Quality Management Plan** or the applicable Areawide Water Quality Management Plan, in accordance with N.J.A.C. 7:15-5.4 shall be incorporated into this section. The Department shall publish a notice of administrative change in the New Jersey Register.

1. – 2. (No change)

3.

| Substance | Criteria | Duration | Waterbody | Associated HUC14 Name | Associated HUC14 Number |
|--|----------|---|--------------|--|-------------------------|
| Chlorophyll <i>a</i> (µg/L) ^(B) | 20 | Seasonal average (June 15th to September 1st) | Dundee Lake | Passaic R Lwr (Dundee Dam to F.L. Ave) | 02030103120080 |
| | 10 | Seasonal average (June 15th to September 1st) | Wanaque Lake | Wanaque Reservoir (below Monks gage) | 02030103070050 |

(B) (No change.)

i. The total phosphorus criterion of 0.1 mg/L at N.J.A.C. 7:9B-1.14(d)4ii(1) does not apply to the following waterbodies:

| Waterbody | Associated HUC14 Name | Associated HUC14 Number |
|-----------|-----------------------|-------------------------|
|-----------|-----------------------|-------------------------|

...

| | | |
|---------------------------|---|----------------|
| Dead River, entire length | Dead River (above Harrisons Brook) | 02030103010080 |
| | Dead River ([above] below Harrisons Brook) | 02030103010100 |

...

(h) (No change.)

7:9B-1.16 Water quality standards variances

- (a) A water quality standards (WQS) variance is subject to 40 CFR 131.14 and 40 CFR 131.20(b). The USEPA must review and approve the variance prior to implementation of any WQS variance. A WQS variance may be initiated either by the Department or at the request of a permittee.**
- (b) The WQS variance policies are, as follows:**
- 1. A WQS variance serves as the interim applicable water quality standard for the term of the WQS variance when implementing:**
 - i. NJPDES permitting requirements pursuant to N.J.A.C. 7:14A; or**
 - ii. Certifications under Section 401 of the Federal Act;**
 - 2. A WQS variance may be adopted for a permittee, waterbody, or waterbody segment, and only applies to the permittee, waterbody, or waterbody segment specified in the WQS variance;**
 - 3. Where a WQS variance is established, the underlying criterion and designated use pursuant to N.J.A.C. 7:9B-1.14 and 1.15 shall be retained by the Department. All other standards not specifically addressed by the WQS variance also remain in effect;**
 - 4. A permittee requesting a WQS variance must demonstrate, to the satisfaction of the Department, that the water quality standards cannot be met due to one or more of the following conditions:**

- i. Naturally occurring pollutant concentrations prevent the attainment of the use;**
 - ii. Natural-, ephemeral-, intermittent-, or low-flow conditions or water levels prevent the attainment of the use, unless these conditions may be compensated for by the discharge of sufficient volume of effluent discharges without violating State water conservation requirements to enable uses to be met;**
 - iii. Human-caused conditions or sources of pollution prevent the attainment of the use and cannot be remedied or would cause more environmental damage to correct than to leave in place;**
 - iv. Dams, diversions, or other types of hydrologic modifications preclude the attainment of the use, and it is not feasible to restore the waterbody to its original condition or to operate such modification in a way that would result in the attainment of the use;**
 - v. Natural features of the waterbody, such as cover, flow, depth, pools, riffles, or lack of a proper substrate, that create physical conditions unrelated to water quality, and preclude attainment of aquatic life protection uses; or**
 - vi. Controls more stringent than those required by sections 301(b) and 306 of the Federal Act would result in substantial and widespread economic and social impact;**
- 5. A WQS variance requested by a new or expanded permittee for an aquatic life criterion specified at N.J.A.C. 7:9B-1.14 that would likely jeopardize the continued existence of any endangered or threatened species, as listed at section**

7 of the Federal Endangered Species Act of 1973 (16 U.S.C. §§ 1531 et seq.), or result in the destruction or adverse modification of such species' critical habitat shall not be granted;

6. A WQS variance may not be adopted if the designated use and criterion addressed by the WQS variance can be achieved by implementing technology-based effluent limits required pursuant to sections 301(b) and 306 of the Federal Act; and

7. A WQS variance for thermal discharge shall be consistent with section 316(a) of the Federal Act and N.J.A.C. 7:9B-1.5(c)9 and (h)2i(3) in lieu of this section.

(c) A permittee requesting a WQS variance to satisfy one of the conditions listed at (b)4 above must submit the following:

1. Ambient, influent, and effluent data collected, in accordance with a Department-approved quality assurance project plan;

2. For a substance or substances that the permittee alleges is naturally occurring, a justification that includes an investigation of the anthropogenic sources of the substance or substances to the receiving stream upstream of the discharge point;

3. A review of possible sources of the substance or substances in the effluent, including, but not limited to, processes on-site, legacy contamination, and influent sources, such as industrial users discharging to a sanitary treatment plant;

4. A review of existing technology installed on-site to treat the influent for the substance or substances of concern and the date that the existing technology was first implemented;

5. **A review of any additional technologies that would lower the effluent concentrations of the substance or substances of concern and the associated cost to implement such technology;**
6. **Information required to determine the affordability of such technology using the USEPA Interim Economic Guidance for Water Quality Standards (see <https://www.epa.gov/sites/production/files/2016-03/documents/econworkbook-complete.pdf>);**
7. **For a WQS variance to a waterbody or waterbody segment, identification of any cost-effective and reasonable best management practices for nonpoint source controls related to the substance or substances and waterbody or waterbody segment specified in the WQS variance that could be implemented to make progress towards attaining the underlying designated use and criterion;**
8. **Documentation demonstrating the highest attainable condition (HAC) for the substance(s). A HAC must be based on the following:**
 - i. **For a permittee-specific WQS variance:**
 - (1) **The highest attainable interim criterion;**
 - (2) **The interim effluent condition that reflects the greatest pollutant reduction achievable; or**
 - (3) **The interim criterion or interim effluent condition that reflects the greatest pollutant reduction achievable with the pollutant control technologies installed at the time the Department adopts the WQS variance, and the adoption and implementation of a Pollutant**

- Minimization Program (PMP), if no additional feasible pollutant control technology can be identified; and**
- ii. For a WQS variance applicable to a waterbody or waterbody segment:
 - (1) The highest attainable interim use and interim criterion; or**
 - (2) The interim use and interim criterion that reflects the greatest pollutant reduction achievable with the pollutant control technologies installed at the time the Department adopts the WQS variance, and the adoption and implementation of a PMP, if no additional feasible pollutant control technology can be identified;****
- 9. A proposed term, including documentation justifying that the proposed term is only as long as necessary to achieve the HAC;**
- 10. A Pollutant Minimization Program, including:**
- i. Pollutant control activities that the permittee proposes to take during the term of the WQS variance, including identification and quantification of source(s) of substance(s) within the permittee's collection system and evaluation of on-site strategies to minimize the discharge of a substance or substances and in the collection system to the maximum extent practicable; and**
 - ii. A schedule for implementing the PMP; and**
- 11. Where applicable, documentation supporting the WQS variance must be submitted justifying the use and value of the waterbody pursuant to section 131.10(a) of the Federal Act for uses that are not specified at section 101(a)(2) of the Federal Act.**

- (d) A permittee requesting a WQS variance to a use specified at section 101(a)(2) of the Federal Act or a sub-category of such a use shall demonstrate that attaining the designated use and criterion is not feasible throughout the term of the WQS variance because:**
- 1. One of the factors listed at (b)4 above is met; or**
 - 2. Actions necessary to facilitate lake, wetland, or stream restoration through dam removal or other significant reconfiguration activities preclude attainment of the designated use and criterion while the actions are being implemented.**
- (e) For a WQS variance term longer than five years, the Department shall reevaluate the WQS variance at least once every five years.**
- 1. A permittee shall submit the following for a reevaluation:**
 - i. A report with the submittal requirements listed at (c) above with the NJPDES permit renewal application pursuant to N.J.A.C 7:9B-1.14;**
 - ii. Documentation of whether, and to what extent, the PMP was implemented and the water quality progress achieved; and**
 - iii. An updated PMP for the subsequent five-year permit cycle.**
 - 2. The Department shall take the following actions in response to reevaluation submittals:**
 - i. Approve and authorize the WQS variance for an additional five years, if the reevaluation submittal is satisfactory;**
 - ii. Propose a permit action to revise the WQS variance if the submittal fails to meet the requirements or the submittal indicates a revised HAC is appropriate; or**

- iii. Suspend the WQS variance if the permittee does not submit the information required for the revaluation of the WQS variance at the frequency specified at N.J.A.C. 7:9B. The variance may be reinstated when this information is submitted and approved by the Department.**

CHAPTER 14A

NEW JERSEY POLLUTANT DISCHARGE ELIMINATION SYSTEM

SUBCHAPTER 11. PROCEDURES AND CONDITIONS APPLICABLE TO NJPDES-DSW PERMITS

7:14A-11.7 Variances and modifications [under] **pursuant to** the State and Federal acts

(a) Any discharger may request a variance from effluent limitations by filing a request by the close of the public comment period established pursuant to N.J.A.C. 7:14A-15.10, as follows:

1. [A variance under N.J.A.C. 7:9B-1.8 or 1.9] **Modifications** for achieving water quality-based effluent limitations[. An applicant shall] **must** follow the procedures [in] **at** N.J.A.C. 7:9B-1.8 or 1.9.

2. (No change.)

(b) – (d) (No change.)

(e) **A permittee requesting a water quality standards variance shall follow the provisions at N.J.A.C. 7:9B-1.16.**