New Jersey Department of Environmental Protection
Division of Water Monitoring and Standards
Bureau of Environmental Analysis, Restoration and Standards

2014 Integrated Water Quality Monitoring and Assessment Methods

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1.0 Introduction

1.1 Background

Since 2001, the United States Environmental Protection Agency (USEPA) has recommended that states integrate their Water Quality Inventory Report (required under Section 305(b) of the federal Clean Water Act (Act)) with their List of Water Quality Limited Segments (required under Section 303(d) of the Act). New Jersey submitted its first Integrated Water Quality Monitoring and Assessment Report (Integrated Report) in 2002. The New Jersey Department of Environmental Protection's (Department) 2014 Integrated Report will continue to follow the integrated format to provide an effective tool for maintaining high quality waters where designated uses are supported, and improving the quality of waters that do not fully support their designated uses.

The Integrated Report includes the "303(d) List of Water Quality Limited Waters" (303(d) List), which satisfies the Section 303(d) requirement to biennially produce a list of waters that are not meeting surface water quality standards (SWQS) despite the implementation of technology-based effluent limits and thus require the development of total maximum daily loads (TMDLs) to restore water quality. The 303(d) List is the only part of the Integrated Report that is subject to regulatory requirements, which include public participation and submission to USEPA for approval and adoption. The 2014 303(d) List will include all assessment units that do not fully support one or more of the applicable designated uses along with the specific pollutant(s) causing non-support and the relative priority of the assessment unit/pollutant combination for TMDL development. The Integrated Report also includes an "Integrated List of Waters" (Integrated List) that combines the reporting requirements of Sections 305(b) and 303(d) of the Act by depicting the use assessment results for every applicable designated use in each assessment unit as "fully supporting", "not supporting", or "insufficient information". The Department will be submitting the 2014 303(d) and Integrated List to USEPA Region 2 via its Assessment Database (ADB) and will publish reports generated from ADB to afford the public the opportunity to review and comment on the draft 303(d) List, in accordance with N.J.A.C. 7:15-6.2.

Prior to developing the 303(d) and Integrated Lists, states are required to publish, for USEPA and public review, the methods used to collect, analyze, and interpret data to determine compliance with applicable water quality standards and assess support of applicable designated uses. This Methods Document serves that function by providing an objective and scientifically sound assessment methodology, including:

- A description of the data the Department will use to assess support of the designated uses;
- The quality assurance aspects of the data and rationales for any decision to not use any existing and readily available data and information;
- A description of the methods used to evaluate compliance with the SWQS; and
- A description of the methods used to evaluate designated use support;
- Changes in the assessment methodology since the last reporting cycle.

Some use assessments are based on indicators or translators of water quality data or conditions, in addition to comparing raw water quality data to numeric criteria. The methods for assessing use support based on these indicators or translators are explained in the Methods Document. These include: the assessment of recreational uses based on beach closure data; the assessment of the general aquatic life use based on indices of biological impairment (see Section 4.3), translators of the SWQS narrative nutrient policies (see Section 4.4); assessment of the fish consumption use based on fish tissue thresholds used for fish consumption advisories or water quality targets established in the Statewide Mercury TMDL (see Section 6.3); and assessment of the shellfish harvest for consumption use based on shellfish classifications (see Section 6.4).

The Delaware River Basin Commission (DRBC) assesses water quality data for the Delaware River mainstem, Estuary, and Bay. Their assessment results are reported in New Jersey's Integrated List and sub-tables of the 303(d) List. DRBC's *2014 Delaware River and Bay Integrated List Water Quality Assessment Report* and corresponding methods are available on DRBC's Web site at: http://www.state.nj.us/drbc.

1.2 Summary of Major Changes from the 2012 Methods Document

Regional Comprehensive Assessment

For the 2014 Integrated Report, the Department will enhance the 2012 Assessment Methods by considering multiple water resource concerns, using across-the-board watershed information and water chemistry, physical, and biological data to produce a robust assessment of environmental conditions affecting water quality in a selected water region. This new Regional Comprehensive Assessment will incorporate one of five water regions (Atlantic Coastal, Lower Delaware, Northwest, Raritan, and Northeast) during each Integrated Report cycle. The rotating basin approach will result in a comprehensive assessment of the entire state every 10 years. This CWRM approach will encourage development of measures to restore, maintain and enhance water quality uses that maximize effectiveness and efficiency in achieving positive environmental outcomes that are tailored to the unique circumstances of each region. The Department will initiate the new Regional Comprehensive Assessment process in the Atlantic Coastal Region for the 2014 Listing Cycle.

Assessment Units and HUC14 Subwatersheds

Generally, New Jersey's assessment units are delineated based on 14-digit Hydrologic Unit Code (HUC) boundaries. However for the 2014 Integrated List, an evaluation of Barnegat Bay using the in-depth data collection associated with the Barnegat Bay Initiative has resulted in a new delineation of the assessment units that better reflect water quality response, replacing 11 assessment units that were based on HUC 14 boundaries with 9 new assessment units. In addition, the three Delaware River AUs representing Zone 5 were consolidated into one. This resulted in the number of assessment units decreasing from 962 to 958 compared to the 2012 cycle.

Data Requirements at Station Level

The data requirements have been expanded to address concerns about the limitations of small data sets. Previous data requirements were not always sufficient to make determinations with a high level of confidence regarding representative water quality conditions. The Department has

increased the number of samples required to support a listing or delisting decision to improve the confidence in the assessment decision and thereby support changes to the Integrated List and 303(d) List. Assessment decisions will also incorporate multiple lines of evidence, increasing the level of confidence in assessment outcomes.

Industrial and Agricultural Designated Uses

The Department will no longer assess agricultural and industrial uses because the criteria that had been used to determine compliance were not approved SWQS criteria for those designated use or were non-promulgated literature based standards.

Integrated Listing Guidance

Within the 2014 Integrated List, pollutants that are identified as responsible for non-attainment of a designated use will contain three new subparts for designated uses that are not being supported or are threatened. The traditional Sublist 5 is for pollutants that that have current anthropogenic sources that are subject to regulation under the CWA. The three new subparts include pollutants that are not actively produced, are not anthropogenic or are primarily generated by sources that are not regulated under the CWA. They include: Sublist 5A (arsenic naturally occurring) Sublist 5L (legacy pollutants) and Sublist 5R (watershed restoration).

Sublist 5A includes AUs where arsenic does not attain standards, but the levels are below those demonstrated to be from naturally occurring conditions. Because arsenic criteria are human health based, EPA does not allow the SWQS provision of "naturally occurring" to supersede the established criteria. Nevertheless, because the source of the non-attainment is natural geology, development of TMDLs is not an effective response.

Sublist 5L includes AUs where designated use non-support is caused by a "legacy" pollutant that is no longer being discharged by a point source but which persists in the environment, for example, PCBs, dioxins, DDT, or other substances already banned from production or use. It also includes waters impaired by contaminated sediments where no additional extrinsic load occurs. For these water segments, development of a TMDL is not the most effective response because there is no controllable load from a CWA regulated source.

The third proposed subpart, Sublist 5R, is used to recognize that not all impaired waterbodies are most effectively addressed through a TMDL. For example, where impairment can be attributed primarily to nonpoint sources, not subject to regulation under the CWA, and regulated stormwater, which is most effectively addressed through source control, a watershed restoration plan may be the most effective means to address the impairment. Watershed Based Plans (WBPs) that incorporate EPA's nine key elements that are critical for achieving improvements in water quality have been completed and approved by the Department for several watersheds. These plans identify mitigation activities needed to address the impairment and restore the waterbody. Implementation of these plans is a priority for use of 319(h) funds and Farm Bill funds, especially in the National Water Quality Initiative watersheds. The 5R approach was successfully piloted in EPA Region 4 where it embraced local watershed restoration efforts providing those states with the opportunity to work with stakeholders on restoration activities aimed at improving water quality without the need to first develop a TMDL. Systematic implementation of the WBPs is an effective means to restore water quality in watersheds with

minimal impact from typical CWA-regulated sources. Pollutants addressed in approved WBPs are considered for inclusion on Sublist 5R.

The Department's approach to differentiate the intended responses to listed impairments is consistent with EPA's new collaborative framework for implementing CWA Section 303(d) Program with States, "A Long-Term Vision for Assessment, Restoration, and Protection under the Clean Water Act 303(d) Program." This approach allows the Department to provide a transparent and rational identification of the intended response to listed impairments.

1.3 Overview of the Methods Document

The Department is required to use all existing and readily available data to assess water quality for the 303(d) and Integrated Lists. With data originating from a host of different entities with different monitoring and analytical capabilities, the Department must ensure that the data used for assessment purposes is representative, reliable and of good quality. The Department must also determine how to use the diverse types of data it generates and receives in a consistent manner to ensure an accurate evaluation of water quality on a station level, which will then be used to determine designated use support at the assessment unit level. The Department's vision for applying a tiered level of assessment, with a rotating regional focus, is outlined in Chapter 2. The overall assessment process used by the Department, beginning with the collection of raw data, through the assessment of designated use support, to the development of the 303(d) and Integrated Lists, is comprised of five steps, each of which is explained in detail in Chapters 3 through 7. Chapters 8, 9 and 10 describe TMDL prioritization, monitoring strategies and the public participation process. Below is a brief summary of each chapter/step in the assessment process.

Chapter 2: Regional Comprehensive Assessment

Chapter 2 describes the Regional Comprehensive Assessment approach that the Department uses to assess waterbodies throughout the State. Through this comprehensive assessment process, the Department aims to systematically enhance the process to identify water quality issues with improved confidence in listing decisions, using robust datasets and multiple lines of evidence, in a selected water region each listing cycle. Theresult is a better understanding of the appropriate restoration response to achieve improved water quality and prioritization of resources to achieve this objective.

Chapter 3: Use and Interpretation of Data

Chapter 3 outlines the requirements regarding quality assurance and quality control, monitoring design, age of data, accurate sampling location information, data documentation, and use of electronic data management that are taken into consideration when deciding if data are readily available and appropriate for use in generating the Integrated and 303(d) Lists. Chapter 3 also discusses the relevant policies established in the SWQS and how they relate to data interpretation.

Chapter 4: Evaluation of Data at the Station Level

Chapter 4 explains the many issues affecting the interpretation of chemical, physical, pathogenic, and biological data that the Department must take into consideration, such as sample size, frequency and magnitude, duration, outliers, and censored data. Chapter 4 describes the procedures used to evaluate chemical parameters and determine if an individual parameter complies with the applicable SWQS (including policies and narrative criteria) at each station. This chapter also describes how the Department evaluates pathogenic and biological indicators to assess water quality impairment at a station.

Chapter 5: Evaluating Data from Multiple Stations within an Assessment Unit

Chapter 5 defines the scale ("assessment unit") used by the Department to assess designated uses and explains the process used to identify all sampling stations associated with each assessment unit. Chapter 5 also explains the additional evaluations and policies that are applied when data for the same parameter is combined from different stations within an assessment unit, including assessment units with more than one stream classification or waterbody type, relative weight of datum, *de minimus* data results, contradictory data sets, and modeling results.

Chapter 6: Designated Use Assessment Methods

Chapter 6 identifies the uses designated for each SWQS classification, the type of data necessary to assess each use, the parameters associated with each designated use (Appendix A), and the minimum suite of parameters needed to determine full support of each use (Table 6.0). Chapter 6 also discusses the methods used to assess use support based on data sampled from multiple locations and/or for multiple parameters. Figure 2 illustrates the relationship between the different levels of data assessment explained in Chapters 4, 5, and 6 and used to generate the 303(d) and Integrated Lists.

Chapter 7: Integrated Listing Guidance

Chapter 7 explains how use assessment results for each assessment unit/designated use combination are entered into ADB and depicted on the published 303(d) and Integrated Lists, taking into consideration causes and sources of non-support, the status of TMDLs, and reasons for removing assessment unit/pollutant combinations from the 303(d) List (i.e., "delisting").

Chapters 8, 9, and 10: Prioritizing, Monitoring, and Public Participation

Chapter 8 describes the methods used to rank and prioritize assessment unit/pollutant combinations for TMDL development pursuant to the requirements of the federal Clean Water Act and the New Jersey Water Quality Management Planning rules. Chapter 9 describes the State's approach to obtaining additional data to assess compliance with SWQS and use support in all New Jersey assessment units. Chapter 10 outlines the public participation requirements and process, regulatory and non-regulatory, employed in the development and finalization of the 303(d) and Integrated Lists, including the data solicitation and the public notification processes employed by the Department.

2.0 Regional Comprehensive Assessment

In 2010, the Department initiated the Barnegat Bay Ten-Point Action Plan as a model approach for water quality assessment and restoration on a regional basis, to be replicated throughout New Jersey. This model is being applied to the rest of New Jersey's waters through comprehensive water resource management (CWRM). Under CWRM, the Department has organized its water program operations to consider water resource issues on a regional, integrated and holistic basis. This CWRM approach will encourage development of measures to restore, maintain and enhance water quality uses that maximize effectiveness and efficiency in achieving positive environmental outcomes that are tailored to the unique circumstances of each region. This approach is also consistent with EPA's, "A Long-Term Vision for Assessment, Restoration and Protection under the Clean Water Act 303(d) Program," which acknowledges there is not a "one size fits all" approach to restoring and protecting water resources. The Regional Comprehensive Assessment process developed for 2014 embodies the CWRM approach.

In 2012, the Integrated Assessment process expanded into a two-step assessment process. Step 1 used improved computer technology to apply the assessment protocols in the Methods Document to determine preliminary assessment decisions. In Step 2 there was an in-depth analysis, incorporating water quality data analysis along with other factors such as hydrology, geology, land use, biological habitat conditions, meteorology, restoration activities, point and nonpoint sources, use designation, stream classification, and other relevant environmental considerations to determine overall water quality. During Step 2, a team of analysts conducted a comprehensive assessment that included confirmation of water quality conditions based on the above factors through the application of Geographic Information Systems (GIS) tools, aerial and satellite-based photography, field observations, and visual assessments. The objective was to produce an in-depth analysis applying across-the-board watershed information to make assessment decisions with a high degree of confidence. This would allow the Department to address multiple water resource concerns based on an assessment of the specific environmental conditions affecting the targeted region.

Since the degree of rigor that could be applied in Step 2 of the 2012 Integrated Assessment was limited because it was applied on a statewide basis with limited resources and time; starting with the 2014 cycle, the comprehensive assessment will be applied more thoroughly, with the focus on a selected region. This is consistent with the vision for the Barnegat Bay Initiative and Comprehensive Water Resources Management. Under this approach, the Department focuses on one of five water regions (Atlantic Coastal, Lower Delaware, Northwest, Raritan, and Northeast) during each Integrated Report cycle (see Figure 2). This approach is supported in EPA's listing guidance and is similar to other states such as New York's continuous rotating basin schedule for monitoring and assessment[1] under their Rotating Integrated Basin Studies program[2]. The rotating basin approach results in a comprehensive assessment of the entire state every 10 years. The Department will initiate the new Regional Comprehensive Assessment process in the Atlantic Coastal Region for the 2014 listing cycle.

[1] See New York State Department of Environmental Protection's Consolidated Assessment and Listing Methodology, available on the NYDEC Web site at http://www.dec.ny.gov/chemical/31296.html. Viewed on January 28, 2013.
[2] NYDEC's Web site at http://www.dec.ny.gov/chemical/30951.html. Viewed on January 28, 2013.

Although the more in-depth analysis is limited to the primary region in a given cycle, water quality data from sampling completed in other regions are also evaluated. Stations located outside the primary region must meet the target sample size identified in the section "Target and Minimum Number of Samples" in order to support a new or revised assessment decision. If clear, obvious confirmation is not evident for assessments outside of the primary region, the final assessment from previous cycles remains or the sampling station is identified as having insufficient data until a comprehensive assessment can be completed. An example of clear, obvious confirmation includes stations that show no exceedances over the last 5 years within an assessment unit or stations that show frequently re-occurring exceedances over the last 5 years whose duration and magnitude of exceedance clearly shows impairment of the waterbody. If the number of samples at a particular station is insufficient (does not meet the target sample size), but the data indicate impairment, further intensive monitoring in conjunction with comprehensive assessment during the appropriate regional cycle will be conducted to verify the impairment before adding the pollutant to the 303(d) List (i.e., "new listing"). Likewise, if the number of samples at a particular station is insufficient but the data indicate that the applicable water quality standards are attained, further intensive monitoring in conjunction with comprehensive assessment during the appropriate regional cycle will be conducted to verify support of applicable designated use(s) before removing the pollutant from the 303(d) List (i.e., "delisting").

As part of the assessment process, the Department ensures data quality and relevance to increase confidence in assessment decisions to better guide current and future restoration efforts and evaluate effectiveness of those efforts. The Department will:

- Use more robust datasets and multiple lines of evidence to formulate an assessment decision;
- Evaluate use support by examining stations within an assessment unit, as well as neighboring assessment units, through a holistic watershed approach;
- Identify transient events such as droughts, flooding, spills, and snow storms that may cause temporary excursions of the criteria but do not affect overall use support;
- Verify biological indices to ensure the appropriate index has been applied;
- Identify and outliers or flawed data caused by data entry, analytical, or collection errors;
- Identify where water quality is due to natural conditions;
- Confirm water quality improvement resulting from restoration projects and TMDL implementation;
- Identify pollutant sources to inform development of restoration responses including through enforcement or permitting programs, targeted funding and stewardship building efforts;
- Identify data gaps to guide future sampling strategies.

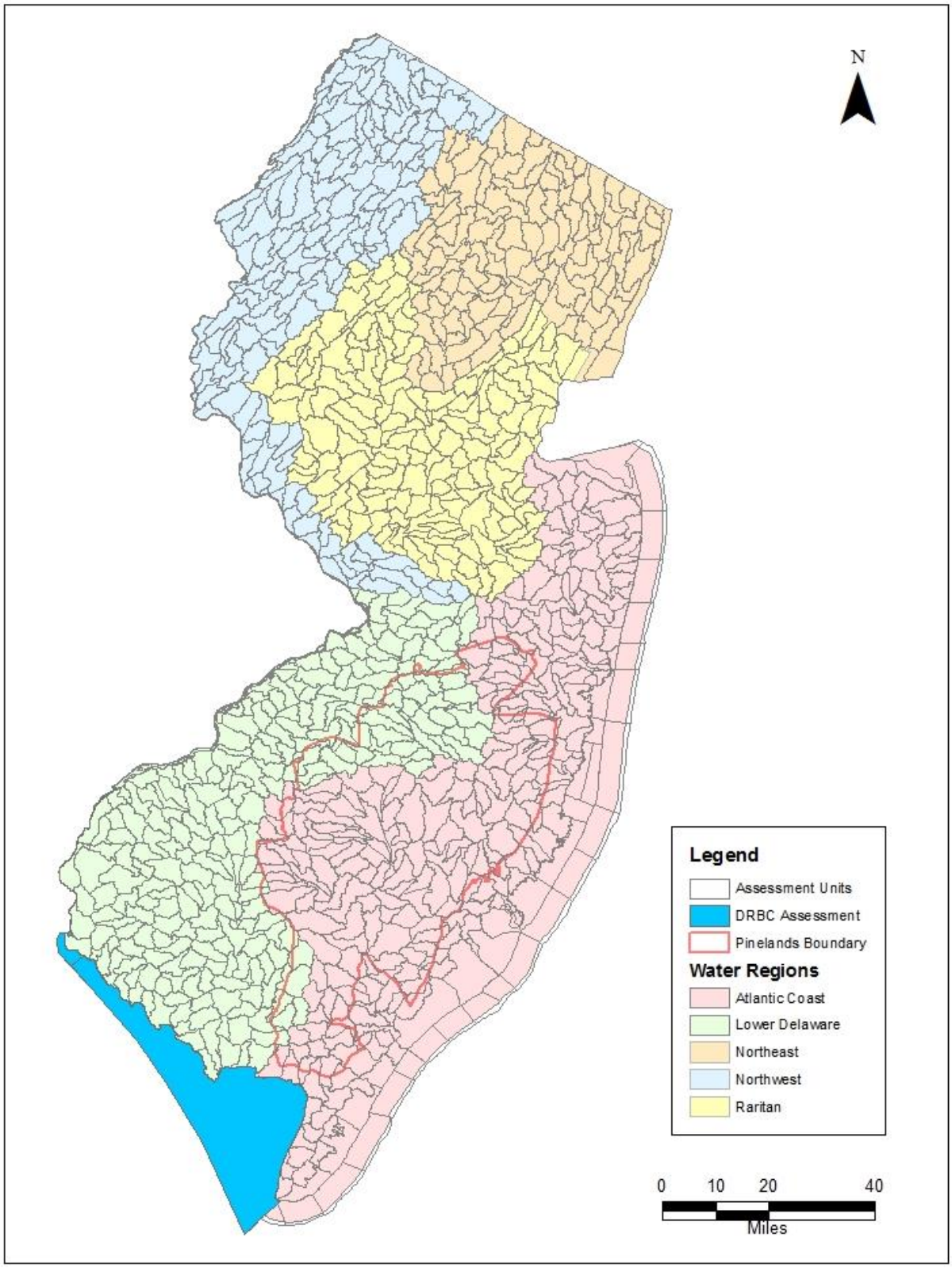
A comparison of the assessment for the primary region and the other regions is provided in Table 2. In each listing cycle, support of Shellfish Harvest for Consumption Use and Beach Closure information are still assessed in the coastal regions.

Table 2: Overview of the Regional Comprehensive Assessment Process

Primary Region	Other Regions
• All data undergoes a comprehensive QA process	• All data undergoes a comprehensive QA process
• Evaluate all sampling stations with data that meet the minimum sample size[1]	• Evaluate sampling stations that meet the new target sample size[1]; otherwise, use the final assessment from previous assessment
• Complete a comprehensive assessment by incorporating all available lines of evidence for the entire region	• Complete a comprehensive assessment on a case-by-case basis for a specific, geographically limited area where warranted
• Update the assessment of designated use support for all uses	• Update designated use support assessment only where there are new assessments

[1] See Section 4.1 'Evaluation of Physical and Chemical Data: Target and Minimum Number of Samples'

Figure 2: New Jersey's Water Regions and Assessment Units



3.0 Use and Interpretation of Data

The Department reviews all existing and readily available data in assessing water quality. With data originating from many diverse entities, the Department must ensure that the data used for assessment purposes is representative and of good quality. The Department must also determine how to use the diverse types of data in a consistent manner to ensure an accurate assessment of the water quality in each assessment unit. This process is outlined below. The Integrated Report includes a list of data sources, where the data can be accessed and identifies which sources were used, as well as provides an explanation for any data not used, to develop the 303(d) and Integrated Lists.

The 2014 303(d) List will be developed using all appropriate and readily available data collected between January 1, 2008 and December 31, 2012 in accordance with a Quality Assurance Program Plan (QAPP) approved by the Department or EPA and uploaded into the Department's Water Quality Data Exchange (WQDE) system at http://www.nj.gov/dep/wms/wqde, USEPA's STORET data warehouse, or the USGS National Water Information System (NWIS) **by July 1, 2013.** Because WQDE, STORET and NWIS may not support all data types, other publically available databases may be used including databases that hold continuous water quality data, biological data, fish tissue data, or beach closure data. The Department requests that data submitters inform the Department which data system contains their data.

3.1 Data Quality

Data Age: The Department considers five years of readily available data collected during the reporting period to characterize current conditions. In the primary assessment water region, older data may also be used in conjunction with newer data to demonstrate water quality trends where appropriate analytical methods have been applied and results can easily be compared with more recent data and the older data enhances the Department's ability to assess current conditions.

Locational Data: Accurate locational data are required to ensure comparison to appropriate SWQS, as well as confirming that sampling stations are located outside of regulatory mixing zones. Digital spatial data in the form of a Geographical Information System (GIS) shape file or Global Positioning System (GPS) coordinates, or latitude/longitude information, must be provided for all monitoring station locations, which must be accurate to within 100 feet. Only sampling stations that are spatially referenced are used to develop the 303(d) and Integrated Lists.

Quality Assurance: The Department maintains a strong commitment to the collection and use of high quality data to support environmental decisions and regulatory programs. Department policy mandates that all environmental data collection activities performed (or for use) by the Department comply with and be accompanied by an approved Quality Assurance Project Plan (QAPP). QAPPs describe the procedures used to collect and analyze samples, along with, the procedures used to review and verify the results to assure high quality data. QAPPs must be approved by the Department, DRBC, USEPA, or the U.S. Geological Survey (USGS). The USEPA's QAPP guidance document is available at

http://www.epa.gov/region02/qa/qa_documents/air_h20_qapp04.pdf. The Department also provides guidance for developing QAPPs for volunteer monitoring data which is available at http://www.state.nj.us/dep/wms/bwqsa/vm/quality_assurance.html. Additional information about the Department's QAPP process is available on the Department's Web site at http://www.nj.gov/dep/oqa/. Entities responsible for generating data are responsible for compiling the data, completing a detailed quality assurance review, and addressing questions regarding the data set.

The sampling protocol for data used in the Integrated Report must also comply with the procedures in the Department's Field Sampling Procedures Manual (NJDEP, 2005) or follow equivalent field procedures, as determined by the Department's Office of Quality Assurance. The Department's Manual includes approved procedures for sample collection, field quality assurance, sample holding times, and other data considerations, and is available for download from the Department's Web site at http://www.state.nj.us/dep/srp/guidance/fspm/). Samples must be analyzed at a laboratory certified by the Department's Office of Quality Assurance, or a federal laboratory (e.g., the USGS National Water Quality Laboratory in Denver) using analytical methods or their equivalents, as certified by the Department pursuant to N.J.A.C. 7:18, USEPA, or USGS.

3.2 Criteria and Policies

The Surface Water Quality Standards (SWQS) provide the foundation for the 303(d) and Integrated Lists. The SWQS establish surface water classifications, the designated uses associated with the surface water classifications, and the criteria and policies established to protect, maintain, and restore the designated uses. Water quality data are assessed for compliance with the SWQS to determine impairment and designated use support.

Antidegradation Policy: The SWQS contain an antidegradation policy that applies to all surface waters of the State. Antidegradation is a requirement of the federal Clean Water Act designed to prevent or limit future degradation of the nation's waters. Under this policy, existing uses shall be maintained and protected. Designated uses shall be maintained or, as soon as technically and economically feasible, be supported wherever these uses are not precluded by natural conditions. No irreversible changes may be made to existing water quality that would impair or preclude support of the designated use(s) of a waterway. No changes shall be allowed in waters that constitute an outstanding national or state resource or in waters that may affect these Outstanding National Resource Waters. The Department applies the antidegradation policy in tandem with the classification of the receiving waterbody in making decisions about proposed new or expanded discharges to surface waters, as well as certain land use permits. Additional information about the SWQS antidegradation policy is available on the Department's Web site at http://www.state.nj.us/dep/wms/bwqsa/swqs.htm.

Assessment of Threatened Waters: Lists of Water Quality Limited Waters (303(d) Lists) are required to include all "threatened and impaired" waters. "Threatened waters" are waters that currently meet water quality standards but are likely to exceed standards by the time the next 303(d) List is generated. Assessing threatened waters requires sufficient existing and readily available data and information on adverse declining trends to predict future water quality. This

means a dataset must be sufficiently robust to support the evaluation of short-and long-term statistical trends. The Department maintains a series of long-term monitoring locations, which support statistical trends assessments developed by the USGS. Assessments to determine if waters are threatened are conducted by the Department wherever sufficient data and trends assessments are available to make such predictions.

Narrative Water Quality Criteria: Narrative water quality criteria are non-numeric descriptions of the conditions necessary for a waterbody to support its designated uses. To assess attainment of narrative criteria, which are qualitative in nature, the Department has identified assessment approaches, also known as "translators", to quantitatively interpret narrative criteria. New Jersey's SWQS contain narrative criteria for toxics, biological assessment, nutrients, and natural conditions.

Toxics: The SWQS contain two narrative criteria for toxic substances:

1. Toxic substances, either alone or in combination with other substances, shall not be present in such concentrations as to affect humans or be detrimental to the natural aquatic biota, produce undesirable aquatic life, or which would render the waters unsuitable for the desired use; and

2. Toxic substances shall not be present in concentrations that cause acute or chronic toxicity to aquatic biota, or bioaccumulate within the organism to concentrations that exert a toxic effect on that organism or render it unfit for human consumption.

The Department uses several translators to assess compliance with the narrative toxic criteria. These translators include: fish tissue concentrations used for consumption advisories (see Section 6.3, Fish Consumption Use Assessment) and shellfish closure data (see Section 6.4, Shellfish Use Designated Use Assessment).

Biological Assessments: Biological metrics (Table 4.3) translate the observed biological conditions into quantitative scales delineating impaired and non-impaired status, which are then assessed along with chemical water quality data (where available) to determine support of aquatic life uses and to help in identifying where impairment is due to pollutants versus pollution (see Section 4.3).

Nutrients: The SWQS include narrative nutrient criteria that apply to all waters of the State, in addition to the applicable numeric criteria for phosphorus for freshwaters. The narrative nutrient criteria prohibit nutrient concentrations that cause objectionable algal densities, nuisance aquatic vegetation, or render waters unsuitable for designated uses.

Natural Conditions: The SWQS at N.J.A.C 7:9B-1.5(c) state, "Natural water quality shall be used in place of the promulgated water quality criteria of N.J.A.C. 7:9B-1.14 for all water quality characteristics that do not meet the promulgated water quality criteria as a result of natural causes." Examples of "natural causes" (i.e., natural conditions) include, but are not limited to: locations where underlying conditions (e.g., geology, hydrology) influence the water chemistry or there are no anthropogenic sources or potential anthropogenic sources are determined not to

be sources of the pollutant in question. Data that do not meet applicable SWQS criteria potentially due to natural conditions are carefully evaluated and any excursions attributed to natural conditions are documented.

Numeric Water Quality Criteria: The surface water quality criteria established for each of the different surface water classifications in the SWQS are numeric limits of constituent concentrations, including toxic pollutants that are protective of the designated uses. Numeric surface water quality criteria have been established for conventional parameters (e.g., dissolved oxygen, pH, temperature), toxics (e.g., metals, organics, unionized ammonia), and sanitary quality (e.g., pathogens). Additional information about numeric water quality criteria is available on the Department's Web site at http://www.state.nj.us/dep/wms/bwqsa/swqs.htm.

4.0 Evaluation of Data at the Station Level

4.1 Evaluation of Physical and Chemical Data

The Department assesses physical and chemical data for which criteria have been established in the SWQS. Once the data is reviewed and deemed of sufficient quality for use in generating the 303(d) and Integrated Lists (see Chapter 3), the data for each parameter sampled at a specific monitoring station are evaluated for compliance with the SWQS in accordance with the assessment protocols described below. If current data is not sufficient for an assessment decision, past assessments are considered valid until new data show that conditions have changed.

Target and Minimum Number of Samples: Small sample sets present challenges, including low confidence in decision making, that may result in failing to identify an exceedance of water quality criteria when a waterbody is impaired, or identifying a waterbody as impaired when a more robust dataset would show that overall water quality criteria is attained. The Department is addressing this issue by increasing the number of samples required for certain parameters, referred to as the target sample size, in order to build confidence in the assessment process. The new target sample size has been selected to more accurately characterize the existing water quality conditions by better capturing natural variability, seasonal changes, varying hydrologic conditions, as well as underlying natural conditions and the effects of anthropogenic activities. For all stations that meet the target sample size, the Department makes an assessment decision based upon the protocol described in this document.

Decisions may be made for datasets smaller than the target sample size if additional data and lines of evidence support an assessment decision. Examples include data from nearby chemical or biological sampling station(s) upstream or downstream that can adequately represent water quality within the subwatershed verify similar conditions, data collected prior to the last 5 years at the sampling station support the assessment decision, data from restoration efforts show improved water quality, data from confirmed pollutant sources verify impacts, visual assessment results validate conditions, sediment data collaborate with water column data, or natural conditions validate the assessment decision.

The target sample size for conventional parameters is 20 samples collected over at least a 2-year period within the specified five-year reporting period. Assessment decisions may also be made based on a minimum of 8 samples at stations in the primary water region, over a 2-year period, if additional data and lines of evidence support an assessment decision.

The target number of samples for metals and toxic pollutants is 8 samples collected over at least a 2-year period within the specified five-year reporting period. Smaller datasets with a minimum of 4 samples collected over a 2-year period may also be assessed at stations in the primary water region if additional data and lines of evidence support making an assessment decision.

For lakes, the target sample size is 8 samples collected over at least a 2-year period within the specified five-year reporting period. Smaller datasets with a minimum of 4 samples collected over a 2-year period in the primary water region may also be assessed if other lines of evidence support water quality condition decisions, such as a Department-approved visual assessment.

The target sample size is the same as the prior minimum sample size for pathogens (5 samples over 30 days over at least a 2-year period), biological sampling (biological index result), and continuous data (see continuous monitoring section).

The minimum sample size is the lowest threshold for making a sound assessment decision. The Department may consider a dataset that does not meet the minimum data requirements on a case-by-case basis to determine if the data adequately characterize the water quality conditions. For example, summer-only sampling for nutrients, pathogenic quality, and temperature data may be acceptable since such data sets generally represent the critical condition for uses associated with these parameters. Datasets with less than the minimum sample size require overwhelming evidence to support an assessment. Examples of overwhelming evidence include: multiple and frequent excursions are corroborated by nearby sampling stations, pollutant sources are confirmed as effecting the waterbody, or biological conditions verify water quality impacts. Datasets less than the minimum sample size are not sufficient evidence to delist from the 303(d) List.

Excursions: Any samples that do not comply with the applicable numeric SWQS criteria are considered **excursions** and are reviewed to determine if the excursion is within the margin of error of the analytical method (see next paragraph) or can be attributed to natural conditions, transient events, or flow conditions that do not represent design flows. An excursion may be attributed to **"natural conditions"** where water quality characteristics do not meet the promulgated water quality criteria as a result of natural causes (see Section 3.2). "**Transient events**" are water quality conditions that occur at very low frequencies over very brief timeframes and, as such, neither impair the designated use of the waterbody nor represent overall water quality conditions. For regulatory purposes, water quality criteria apply only where stream flow is maintained at or above the "**design flow**" specified for the applicable numeric SWQS criteria, which is usually the MA7CD10 (see N.J.A.C. 7:9B-1.5(c)). Flow conditions are evaluated (when available) for all excursions to determine if the data were collected under appropriate flow conditions. Excursions that can be attributed to any of these conditions are not considered as exceedances of the SWQS criteria for the purposes of making an assessment

decision. These types of excursions are explained and documented in the Integrated List generated from USEPA's ADB.

Frequency and Magnitude of Exceedance: The Department has determined that a minimum of two exceedances of a SWQS criterion are necessary to indicate possible noncompliance with the criteria. For datasets that meet or exceed the decision target sample size, the Department considers the relative frequency and magnitude of the exceedances within the dataset and uses available lines of evidence to determine non-support of the designated use. All such determinations are documented in the Integrated List generated from USEPA's ADB. Additionally, when assessing discrete grab sample data, exceedances must be 7 days apart to capture separate or extended events. For continuous and intensive sampling, see "Continuous Monitoring" below for a description of exceedance frequency.

Analytical Uncertainty: In making assessment decisions regarding exceedances, the Department takes into consideration the analytical uncertainty of the analytical method used to measure the data when an ambient measurement is compared to a numeric SWQS criterion. This uncertainty is a product of the methods used to sample, analyze, and report the data and defines the ability of the analysis to discriminate between minute differences in a measurement. For example, if the surface water quality criterion is "not to exceed 1.0 mg/l" and the margin of error for the instrument is "(+) or (-) 0.2 mg/l," the analysis is unable to discriminate between an ambient level of 0.8, 0.9, 1.0, 1.1 and 1.2 mg/l.

Computations Using Censored Data: Censored data are reported values that are less than the minimum reporting limit of an analytical procedure. These data are usually labeled with a "<" symbol followed by the reporting limit in the data report received from the laboratory. Normally, censored values are set to one-half of the reporting limit; however, there are situations when censored values are handled differently. If a parameter's criteria is less than a reporting limit, the censored data is not used in the assessment since it cannot be determined if the value meets or exceeds the criteria. If a criteria is an average (annual, 70-year) and the criteria is less than a reporting limit: (1) when censored data represent less than 50 percent of the dataset, the Department calculates a *median* value of the non-censored data and compares that median to the applicable criterion; (2) when censored values exceed 50 percent of the dataset, the Department considers the dataset insufficient to determine if the criterion has been exceeded. In calculating geometric means for pathogenic data, New Jersey follows EPA's recommendations whereby the censored values are set to the reporting limit and the geometric mean is then calculated.

Estimated Data: Estimated data are reported values from a laboratory that are flagged with a comment that the data is "estimated" because the analytic method detected an amount less than the reporting limit but more than the method detection level or there was a situation during the analytical process that caused the uncertainty to be above the method's approved accuracy. Because of its high uncertainty, estimated data that appear to exceed a criterion are not considered as exceedances.

Continuous Monitoring: More and more frequently, instruments, such as Datasondes, are being deployed to continuously monitor the water from as short as three days to very long time periods. Additionally, intensive monitoring events that collect numerous samples in a short time

period are being used to complement discrete sampling datasets. The parameters most commonly measured in this fashion are dissolved oxygen (DO), pH, water temperature, and turbidity. The protocol for comparing continuous monitoring data, collected over a minimum of three days, to the SWQS criteria is as follows (see also "Duration (Exposure Periods)"):

- All Parameters: For SWQS criteria expressed as either a minimum or "not less than at any time", an excursion relative to the minimum criteria occurs when the concentration over a 24-hour period is below the criterion for at least an one-hour duration. For assessment purposes, a minimum of two such excursions at the same location during two or more 24-hour periods may be considered as an exceedance. For large continuous datasets, relative frequency and magnitude of the exceedances within the dataset are also considered to determine non-support of the designated use. All determinations are documented in the Integrated List generated from USEPA's ADB.

- Dissolved Oxygen: The SWQS criteria for DO are expressed as either a minimum, "not less than…at any time" concentration or as a 24-hour average concentration. See description of "All Parameters" for exceedances of the minimum criteria. An excursion relative to the 24-hour average criterion occurs when the average concentration of all measurements recorded within a 24-hour period is below the criterion. A minimum of two such excursions occurring at the same location constitutes an exceedance of the criterion. See Section 4.4 for additional protocols employing continuously monitored DO data to assess nutrient impacts.

- DO Swing: When assessing diurnal DO swing (i.e., continuous change in DO concentration over time), the Department reviews the results from continuous monitoring performed during the growing season and calculates the average of the daily measured DO swings, to determine if photosynthetic activity may be occurring at a rate that reflects excessive nutrient enrichment.

- Temperature: The SWQS criteria for temperature are expressed as either a daily maximum or as a rolling 7-day average of the daily maximum. See description of "All Parameters" for exceedances of the daily maximum. An exceedance of the rolling 7-day average criterion occurs when the average of the daily maximum of each 7-day period exceeds the criteria. Any exceedance of the rolling 7-day average constitutes non-compliance with the temperature criteria.

- Turbidity: The SWQS criteria for turbidity are expressed as either a maximum "not to exceed at any time" or as a 30-day average. See description of "All Parameters" for exceedances of the maximum "not to exceed at any time". Any exceedance of the 30-day average constitutes non-compliance with the turbidity criteria.

Duration (Exposure Periods): The SWQS include criteria-specific exposure periods (durations) that range from one hour to 70 years. In assessing compliance with the SWQS, the Department takes into consideration the specific duration applicable to the criterion for the parameter being assessed. For example, chronic aquatic life criteria require a four-day exposure period; therefore, data collected under flow conditions that last less than four days (as is

generally the case for high flow conditions) are not considered valid for assessment of chronic aquatic life criteria but such data may be used to assess acute aquatic life criteria, which do not have such duration constraints. For human health carcinogen criteria, which are based on a 70-year exposure rate, the Department calculates a long-term average of all data available for the most recent five-year period for comparison to the applicable criterion.

Total Recoverable and Dissolved Metal Data: SWQS criteria for metals include human health (HH), acute aquatic life (AQLa), and chronic aquatic life (AQLc). HH criteria are based on the total recoverable (TR) form of the metal to protect human health, while AQLa and AQLc are based on the dissolved fraction to protect aquatic life. To the extent available, total recoverable (TR) and dissolved fraction (DF) data are compared to the TR and DF criterion, respectively. When only TR data are available, in addition to comparing the TR concentration to the TR criterion, the Department also compares the TR concentrations to the DF criterion. If the TR concentrations are below the DF criterion, the Department concludes the DF criterion is also met. TR concentrations above the DF criterion will trigger additional sampling for DF.

Criteria in the Pinelands: Current SWQS criteria in the Pinelands (PL) require these waters be maintained as to quality in their existing state or that quality necessary to attain or protect the designated uses, whichever is more stringent. This applies to all chemical, physical and biological elements except for nitrate and pH that have Pineland specific numeric criteria. Since existing data and sampling protocols for ambient data precludes the ability to use this narrative standard to effectively assess these waters, the Department has determined that it is appropriate to apply freshwater (FW2) numeric criteria to PL waters for some chemical and physical assessments to determine if they meet the minimum standards to support their designated use, unless and until appropriate concentration thresholds corresponding to existing state are determined (7:9B-1.14 (b) 1 in NJDEP's SWQS). For biological assessments, the Department developed a Pineland specific benthic macroinvertebrate index to assess biological conditions which is described in section 4.3 Biological Data. For temperature and dissolved oxygen, because these criteria are primarily based on fish species to determine thresholds and fish species in the Pinelands are similar to other New Jersey fresh waters in the inner coastal plain, the Department applies the corresponding FW2 criterion as a surrogate for the criterion for PL waters when assessing the Aquatic Life and Trout Designated Uses. For other physical and chemical parameters such as *E. coli*, enterococcus, phosphorus, turbidity, TSS, and TDS, the corresponding FW2 criteria are used to determine if the associated designated use is supported. It is understood that the Pineland's unique ecosystem and natural conditions may have requirements that are not accounted for in the FW2 criteria, therefore, the Department will explore future options to determine appropriate assessment methods that accurately reflect natural conditions in these waters. These options include collecting continuous data to cover a range of conditions to determine the background or existing natural conditions and evaluating if revised criteria are appropriate.

Outliers: Any datum that is identified as an outlier based on an accepted statistical methodology (such as ASTM E178, available on the American Society for Testing and Materials Web site at http://www.astm.org/Standards/E178.htm) is not considered a valid result and is not assessed.

4.2 Pathogenic Indicators

Pathogenic indicators are used to assess recreational and shellfish harvest for consumption uses. The type of pathogenic indicator sampled depends on the type of use assessed: *Escherichia coli* (E. coli) is sampled to assess primary contact recreation in freshwaters; fecal coliform is sampled to assess secondary contact recreation in SE2 and SE3 waters; *Enterococcus* is sampled to assess primary contact recreation in SE and SC waters; and total coliform is sampled to assess the shellfish harvest for consumption use in shellfish waters.

4.3 Biological Data

The Department has developed biological indicators (benthic macroinvertebrates and fin fish) to evaluate aquatic life use support.

Benthic Macroinvertebrate Data: The Department uses three biological indices based upon genus level taxonomy to evaluate biological conditions in freshwater streams. The three indices were developed for different physiographic regions of the State: the High Gradient Macroinvertebrate Index (HGMI), which applies to the streams of northern ecoregions (Highlands, Ridge and Valley, and Piedmont); the Coastal Plain Macroinvertebrate Index (CPMI), which applies to the Coastal Plain (excluding waters considered Pinelands waters); and the Pinelands Macroinvertebrate Index (PMI), which applies to PL waters contained within the jurisdictional boundary of the Pinelands as well as FW2 waters that are representative of the Pinelands. For the PMI, scores in the fair category are assessed as impaired if the waters are classified as PL, but are assessed as not impaired if the waters are classified as FW2. This is because the PMI was developed specifically to reflect the unique conditions of Outstanding National Resource Waters (ONRW) PL waters. Because FW2 waters are not expected to have the same biological conditions as ONRW waters, the fair category is regarded as fully attaining the aquatic life use. Additional information about these three metrics is available in the Standard Operating Procedures for Ambient Biological Monitoring Using Benthic Macroinvertebrates - Field, Lab, Assessment Methods (NJDEP, 2007), available on the Department's Web site at http://www.state.nj.us/dep/wms/bfbm/download/AMNET_SOP.pdf). A fourth Benthic Index of Biotic Integrity was developed for the New York/New Jersey Harbor Estuary based on USEPA Region 2's Regional Environmental Monitoring Assessment (REMAP) protocol and applied to all waters within the New York/New Jersey Harbor Estuary. This index was developed by scoring each metric in 3 categories, "5", "3", or "1". Additional information is available on USEPA's Web site at http://www.epa.gov/emap/remap/html/docs/nynjsedapp1.pdf. The four regions applicable to each metric are shown in Figure 4.3. Assessment result scenarios for each metric are shown in Table 4.3a.

Figure 4.3: Spatial Extent of Application for Each of the Benthic Macroinvertebrate Indices Applied in New Jersey

Region Assessed by High Gradient Macroinvertebrate Index (HGMI)

Region Assessed by Pinelands Macroinvertebrate Index (PMI)

Region Assessed by Coastal Plain Macroinvertebrate Index (CPMI)

Region Assessed by REMAP Estuarine Index

Table 4.3a: Descriptive and Regulatory Thresholds for Biological Metrics

Macroinvertebrate Index for High Gradient Streams (HGMI Metric)
(Highlands, Ridge and Valley, Piedmont Physiographic Provinces)

Category	Metric Score	Assessment
Excellent	63 - 100	Not Impaired
Good	42 - < 63	Not Impaired
Fair	21 - < 42	Impaired
Poor	< 21	Impaired

Macroinvertebrate Index for Low Gradient (CPMI Metric)
Coastal Plain (Non Pinelands) Streams

Category	Metric Score	Assessment
Excellent	22 - 30	Not Impaired
Good	12 - < 22	Not Impaired
Fair	6 - < 12	Impaired
Poor	< 6	Impaired

Macroinvertebrate Index for Pinelands Waters (PMI Metric)

Category	Metric Score	Assessment Result
Excellent	63 - 100	Not Impaired
Good	56 - < 63	Not Impaired
Fair	34 - < 56	Impaired[1]
Poor	< 34	Impaired

Regional Monitoring and Assessment Program (REMAP)
Assessments (Raritan & Newark Bay, Arthur Kill, Kill Van Kull)

Overall Metric Score	Assessment Result
≥3	Not Impaired
<3	Impaired

[1]Scores in the fair category are assessed as impaired if the waters are classified as PL, but are assessed as not impaired if the waters are classified as FW2. PMI was developed specifically to reflect the unique conditions of Outstanding National Resource Waters (ONRW) PL waters. Because FW2 waters are not expected to have the same biological conditions as ONRW waters, the fair category is regarded as fully attaining the aquatic life use.

Volunteer Benthic Macroinvertebrate Data: Although the HGMI, CPMI, and PMI are the primary indices used to evaluate biological conditions in freshwater streams**,** additional indices have been developed for citizen scientists and volunteer organizations to use when identification of organisms to the genus/species level is cost prohibited. These volunteer indices are modeled after the Department's three biological indices but use the less detailed order/family level taxonomy to evaluate biological conditions in freshwater streams instead of the genus level taxonomy.

The three volunteer indices apply to the State's waters using the same ecoregions as defined above, although the number of categories is reduced to three categories: Healthy, Stressed, and Undetermined. The category reduction was necessary to address the level of precision that is lost

using order/family level data in lieu of genus level data, resulting in the reduction of the "Good" and "Fair" categories to "Undetermined" since the data precision does not allow an assessment decision to be made between non-impaired and impaired conditions within these categories. The indices only allow assessment decisions for streams that show very healthy or stressed biological conditions and are based on the concept that when a stream is very healthy the macroinvertebrates found in the sample show a diversity of organisms with high counts of organisms intolerant to pollution, while in an impaired stream the macroinvertebrates show a lack of diversity in organisms with a majority found to be tolerant to pollution. Table 4.3b shows the categories and metric scores. Additional information describing the development of the volunteer indices can be found at: http://www.state.nj.us/dep/wms/bwqsa/vm/docs/draft_tetra_tech_report_20100310.pdf.

Table 4.3b: Volunteer Benthic Macroinvertebrate Indices

Volunteer High Gradient Index (VHGMI)

Category	Metric Score	Assessment
Healthy	≥ 65	Not Impaired
Undetermined	64 - 36	Not Assessed
Stressed	< 35	Impaired

Volunteer Coastal Plain Index (VCPMI)

Category	Metric Score	Assessment
Healthy	> 20	Not Impaired
Undetermined	19 - 13	Not Assessed
Stressed	< 12	Impaired

Volunteer Pineland Index (VPMI)

Category	Metric Score	Assessment Result
Healthy	≥ 75	Not Impaired
Undetermined	74 - 46	Not Assessed
Stressed	< 45	Impaired

Fin Fish Data: The Department uses two biological indices based on fish population data to evaluate biological conditions in freshwater streams. Fin fish data are assessed using the Fish Index of Biotic Integrity (FIBI). There are two indices developed for different physiographic regions of the State: the Northern Fish IBI (N_IBI), which applies to the streams of northern ecoregions (Highlands, Ridge and Valley, and Piedmont); the Southern Fish IBI (S_IBI), which applies to the Inner Coastal Plain (excluding waters considered Pinelands waters). A more detailed description of the FIBI program, including sampling procedures, is available on the Department's Web site at http://www.state.nj.us/dep/wms/bfbm/fishibi.html.

The Northern Fish IBI has four assessment result categories: excellent, good, fair, and poor. Scores in the "excellent", "good", and "fair" categories indicate that biology is not impaired while scores in the "poor" category indicates that the biology is impaired. The Southern Fish IBI has five assessment result categories: excellent, good, fair, poor, and very poor. Scores in the

"excellent", "good", and "fair" categories indicate that biology is not impaired while scores in the "poor" and "very poor" categories indicates that the biology is impaired (see Table 4.3b).

Table 4.3b: Descriptive and Regulatory Thresholds for Biological Metrics

Northern Fish Index of Biotic Integrity (N_IBI) -
Highlands, Ridge and Valley, Piedmont Physiographic Provinces

Category	Metric Score	Assessment Result
Excellent	45 - 50	Not Impaired
Good	37 - 44	Not Impaired
Fair	29 - 36	Not Impaired
Poor	10 - 28	Impaired

Southern Fish Index of Biotic Integrity (S_IBI) -
Inner Coastal Plain (Non Pineland)

Category	Metric Score	Assessment Result
Excellent	81-100	Not Impaired
Good	61-80	Not Impaired
Fair	41-60	Not Impaired
Poor	21-40	Impaired
Very Poor	0-20	Impaired

Additional Considerations When Evaluating Biological Data

- In general, biological assessments are based on the most recent results. However, the Department takes into consideration the results from previous years' assessment results when making a final assessment decision.

- Because genus level indices provide significantly more accurate assessments of biological conditions than the order/family level indices, they are the primary means to assess benthic macroinvertebrate communities.

- Disturbed or impaired biota can result from drought conditions that result in reduced base flow and very high flows. If biological communities are impaired due to drought-induced, low flow conditions or during very high flood conditions, the impairment is attributed to natural conditions and the data are not considered valid for assessment purposes (see "Natural Conditions" in Section 3.2).

- The Department has developed multiple biological indices based upon both fish and benthic macroinvertebrates that represent several tropic levels and each assessing significantly different spatial and temporal scales. Where multiple indices are employed on a waterbody, if one indicates impairment, the aquatic life use is listed as impaired.

5.0 Evaluating Data from Multiple Stations within an Assessment Unit

While the initial data evaluation is conducted at the station level, use assessments are conducted for entire assessment units, each of which may contain data from multiple stations and multiple waterbody types. Data from one or more monitoring stations located within a given assessment unit are used to evaluate water quality within that assessment unit's boundaries. Exceedances of applicable SWQS or biological indices identified at the parameter/station level are further evaluated collectively for each parameter sampled at all monitoring stations within the assessment unit. Where stations within an assessment unit yield different assessment results, generally the assessment decision is based on the worst case. Where there are numerous beach or shellfish harvest closures within an assessment unit, the spatial coverage of these impairments are evaluated in assessing support of the recreation and shellfish consumption uses for the respective assessment units. The final decision in the primary water region is based on the Regional Comprehensive Assessment process by completing a thorough, in-depth analysis incorporating water quality data along with other factors such as hydrology, geology, land use, biological habitat conditions, meteorology, restoration activities, point and nonpoint sources and other relevant scientific considerations to determine overall water quality in the assessment unit.

Assessment Units: The Integrated List presents the assessment results of 958 assessment units that include New Jersey's 950 assessment units, which are assessed by the Department, and 8 assessments units for the Delaware River and Bay, which are assessed by DRBC. The Delaware River assessment units were consolidated in Zone 5 to follow DRBC's consolidation from three zones (Zones 5A,5B,5C) to one (Zone 5). Generally**,** New Jersey's assessment units are delineated based on 14-digit Hydrologic Unit Code (HUC) boundaries. HUCs are geographic areas representing part or all of a surface drainage basin or distinct hydrologic feature as delineated by the USGS in cooperation with the Natural Resources Conservation Service (NRCS). The HUC system starts with the largest possible drainage area and progressively smaller subdivisions of that drainage area are then delineated and numbered in a nested fashion. In 2009, the Department revised the HUC 14 boundaries to be more consistent with the new federal HUC 12 boundaries, which are based on 1:24,000 base maps for elevation control and a new 1:2,400 hydrography coverage (see NJGS TM09-2 available on the Department's Web site at http://www.nj.gov/dep/wms/bwqsa/tm09-2.pdf.

For the 2014 Integrated List, all of the assessment units are based on HUC 14 boundaries except for changes within the Barnegat Bay. The Department revised the assessment units in the Barnegat Bay, based on hydrologic and water quality data, to more accurately reflect conditions within the bay. This resulted in replacing 11 assessment units that were based on HUC 14 boundaries with 9 new assessment units. These changes are reflected in Figure 5.0. These changes only apply to the Integrated Report and do not affect the HUC 14 subwatersheds .

Figure 5.0: Revised Assessment Units in the Barnegat Bay. Shows new assessment units and relationship to HUC 14 boundaries.

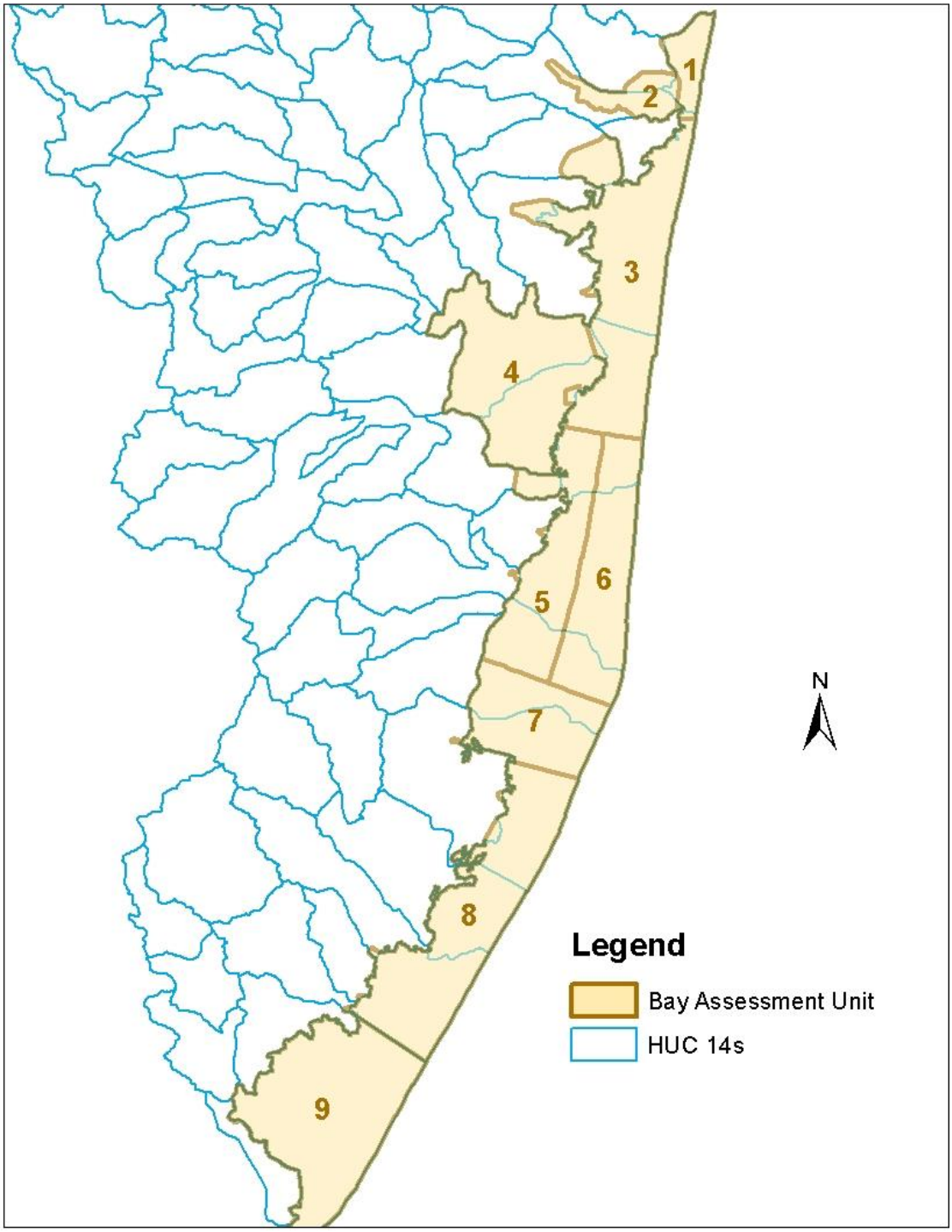


Table 5.0: Revised Assessment Units in the Barnegat Bay

ID	Assessment Name
BarnegatBay01	Point Pleasant Canal and Bay Head Harbor
BarnegatBay02	Metedeconk R Estuary
BarnegatBay03	Metedeconk and Lower Tribs - Bay
BarnegatBay04	Toms R Estuary
BarnegatBay05	Barnegat Bay Central West
BarnegatBay06	Barnegat Bay Central East
BarnegatBay07	Barnegat Bay Central Bottom
BarnegatBay08	Manahawkin Bay and Upper Little Egg Harbor
BarnegatBay09	Lower Little Egg Harbor Bay

Station Representation: Monitoring stations are associated with an assessment unit for the purpose of making water quality assessment decisions. Before assigning a monitoring station to an assessment unit, the Department reviews the monitoring station location to determine if it represents the water quality conditions of an assessment unit. Factors used to determine a monitoring station's spatial extent include the location of potential point and nonpoint sources, land use, stream classifications, significant tributaries, impoundments, or other hydrological alterations that could impact water quality. If there are no applicable monitoring stations for an assessment unit, the uses designated for that AU is assessed as "insufficient information".

De minimus: When evaluating data from multiple stations within an assessment unit, the Department may evaluate the spatial extent of impairment. If the Department determines that the station with impaired water quality represents a very small portion of the assessment unit, and water quality at the other stations is not impaired, then the impairment is considered "*de minimus*" and the entire assessment unit is assessed as "fully supporting" the applicable use. These decisions are documented in the Integrated List generated from USEPA's ADB.

Assessment Units With More Than One Stream Classification: Data is compared to the SWQS for the stream classification where the station is located. Assessment units may contain both FW and SE waters, or a combination of Trout Production, Trout Maintenance, and Non-Trout waters. Where the assessment unit contains more than one classification and there is no data for the higher classification, then data from the station located in the lower classification is compared to the SWQS for higher classification. If the station meets the SWQS for higher classification, the data is used to assess both classifications. However, if the station located in the lower classification does not meet the SWQS for the higher classification, the higher classification cannot be assessed and the use associated with the higher classification is assessed as "insufficient information."

"Weighing Data": In circumstances where multiple sampling stations represent an AU, weighing data is necessary when evaluating numerous data sets that have different data collection and analysis methods, or have temporal or spatial sampling variability. Contradictory data sets are "weighed" as follows: newer data overrides older data; larger data sets with better temporal coverage override nominal data sets; sampling stations with a location that is more representative of the AU may override other stations that are poorly located or are "de minimus",

and higher quality data overrides data sets of lower quality based on sampling protocol, equipment, training and experience of samplers, quality control program, and lab and analytical procedures.

Where both grab samples and continuous monitoring data are available, the Department gives more weight to the continuous monitoring data where grab samples do not capture the most critical time period. For continuous monitoring, the location, duration, time period and data quality/reliability are considered when determining its significance in reflecting water quality conditions.

Assessing Lake Data: Lakes are assessed based upon *in-lake* chemistry data collected just below the *surface* (generally at a one-meter depth if the lake is sufficiently deep). Lakes may have multiple in-lake sampling locations, depending on their size. Each sampling location within a lake is considered a "subsample". Lake subsamples that do not comply with the applicable numeric SWQS criteria are considered exceedances; however, exceedances occurring at multiple locations or subsamples within a lake on the same date are considered a single exceedance.

Modeling and Sampling Results: Water quality models are used to predict changes in water quality over time under different flow, weather, and temporal conditions. The Department may use the results obtained through a validated water quality or dynamic model to assess use support and/or place or remove an assessment unit/pollutant combination from the 303(d) List, if the Department determines that the model adequately predicts water quality in that assessment unit.

6.0 Designated Use Assessment Methods

The SWQS identify specific designated uses for the waters of the State according to their waterbody classifications. Designated uses include:

- Aquatic Life (General and Trout);
- Recreation (Primary and Secondary Contact);
- Fish Consumption;
- Shellfish Harvest For Consumption;
- Drinking Water Supply;

The Department uses both numeric and narrative criteria and policies to protect designated uses. Numeric criteria are estimates of constituent concentrations that are protective of the designated uses. Narrative criteria and policies are non-numeric descriptions of conditions to be supported, maintained, or avoided. The Department has identified assessment approaches, also known as "translators", to quantitatively interpret narrative criteria/policies, which are qualitative in nature. This section outlines the methodologies used to assess support of each designated use based on the numeric and/or narrative criteria applicable to each use and the integration of data for multiple parameters at multiple stations for each assessment unit.

Appendix A of the Methods Document identifies the parameters associated with each designated use. The Department assesses designated use support by evaluating compliance of the water quality results with the applicable SWQS criteria or translators. However, data for every parameter associated with a particular use is not required to assess the use. The Department uses a conservative approach regarding use assessment that requires more extensive data for concluding that an assessment unit is "fully supporting" a designated use than is needed to conclude that the use is not supported. Specifically, an assessment unit is assessed as fully supporting the designated use only if data for the minimum suite of parameters are available and the data indicate that it meets the applicable criteria. If data for the minimum suite of parameters is not available, the applicable use is assessed as "insufficient information". If data for any one parameter associated with a designated use (Appendix A parameters) exceed the applicable criteria, the assessment unit is assessed as not supporting the designated use even if data for the minimum suite of parameters are not available. (Note that "insufficient information" can mean either that sufficient data are not available to assess the designated use (Table 6.0) or that no data are available (i.e., that use/assessment unit is not sampled).

Table 6.0: Minimum Suite of Parameters Needed to Determine Use Is "Fully Supporting"

Designated Use	**Minimum Suite of Parameters**
General Aquatic Life	Biological data
Aquatic Life - Trout	Biological data and Temperature and DO
Recreation	Pathogenic Indicator Bacteria
Shellfish Harvest for Consumption	Total Coliform
Public Water Supply	Nitrate
Fish Consumption	Fish tissue data

6.1 Aquatic Life Use Assessment Method

The aquatic life use in non tidal freshwaters is assessed by evaluating conditions of biotic communities using metrics developed for benthic macroinvertebrate data, in conjunction with fin fish Index of Biotic Integrity (FIBI) data, while in marine waters a biotic index has only been developed in the New York/New Jersey Harbor Estuary for benthic invertebrates. All of these waters are supplemented with a broad suite of biologically-relevant physical/chemical data (e.g., dissolved oxygen, temperature, toxic pollutants). The biological assessment integrates a full suite of environmental conditions over many months (for macroinvertebrates) to many years (for fish). Biological data is required to conclude that aquatic life uses are fully supported; however, chemical data alone is sufficient to determine that the use is not supported and to place the chemical parameter on the 303(d) List as the cause of non-support. The required minimum physical/chemical parameters differ for the two designated aquatic life uses, based on the criteria associated with their respective stream classifications. Specifically, both temperature and dissolved oxygen are required, in addition to biological data, to determine if the trout aquatic life use is fully supported but only biological data is required to determine if the general aquatic life use is fully supported (see Table 6.0). Table 6.1 summarizes the possible outcomes of the aquatic life use assessment based upon various combinations of data and results.

Table 6.1: Aquatic Life Use Assessment Results

Results of Biological Assessment*	Results of Aquatic Life Use Assessment (General and Trout)
Biological Monitoring Data Available, No Chemical/Physical Data Available	
Biology is not impaired or threatened	• General aquatic life use is "Fully Supporting" • Trout aquatic life use is "Insufficient Information".
Biology is impaired or threatened	Both aquatic life uses are not supported; "cause unknown" identified as the cause.
Both Biological and Chemical/Physical Data Available	
Biology is not impaired or threatened, there are no chemical exceedances, and water quality is not threatened	Both aquatic life uses are "Fully Supporting"
Biology is impaired or threatened AND chemical/physical data show exceedances of aquatic life criteria or are threatened	Both aquatic life uses are "Not Supporting"; parameter(s) exceeding criteria identified as the cause.
Biology is impaired or threatened BUT chemical/physical data show NO exceedances of aquatic life criteria	Both aquatic life uses are "Not Supporting"; "cause unknown" identified as the cause.
Biology is not impaired or threatened BUT chemical/physical data show exceedances of aquatic life criteria or waters quality is threatened	Both aquatic life uses are "Not Supporting"; parameter(s) exceeding criteria identified as the cause, unless due to natural conditions.
No Biological Data Available; Chemical/Physical Data Available	
No exceedances of aquatic life criteria	Insufficient data to assess both aquatic life uses
Exceedance of any aquatic life criterion	Both aquatic life uses are "Not Supporting"; parameter(s) exceeding criteria identified as the cause.

***** The methods for assessing biological data are explained in Section 4.3, "Biological Data".

6.2 Recreational Use Assessment Method

The SWQS identify two levels of recreational use – primary contact and secondary contact. Primary contact recreation is defined as those water-related recreational activities that involve significant ingestion risks and includes, but is not limited to, wading, swimming, diving, surfing, and water skiing. Secondary contact recreation is defined as those water-related recreational activities where the probability of water ingestion is minimal and includes, but is not limited to, boating and fishing. SWQS criteria have been promulgated for primary contact recreation in SC, SE1, PL, and FW2 waters. SWQS criteria have been promulgated for secondary contact recreation in SE2 and SE3 waters. Primary contact recreation in FW1 waters is assessed using the SWQS criteria for FW2 waters because numeric criteria for recreational uses have not been promulgated for FW1 waters.

Recreational use support is assessed primarily by comparing the geometric mean (geomean) of the water quality data for pathogenic indicators to the appropriate SWQS criterion (see Section 4.2). At least five samples collected within a 30-day period are required to calculate a geomean in accordance with the current SWQS; however, other sampling frequencies may be acceptable provided that the frequency supports the statistical method for calculating a seasonal geomean. Beach closure data is also considered in assessing recreation uses in assessment units that contain designated bathing beaches. "Designated bathing beaches" include beaches that are heavily used for primary contact recreation, such as swimming, bathing, and surfing, during the recreational season pursuant to the New Jersey State Sanitary Code, N.J.A.C. 8:26. Assessment units containing designated bathing beaches are assessed as fully supporting primary contact recreation if the seasonal pathogenic indicator geomean does not exceed the applicable SWQS and there are no beach closures lasting seven or more consecutive days in a given year, nor does the average number of beach closures exceed two per year over a five-year period. Beach closure procedures are established at N.J.A.C. 8:26-8.8, which is available on the U.S. Department of Health and Senior Service's Web site at http://www.state.nj.us/health/eoh/phss/recbathing.pdf. In assessing designated bathing beaches, the Department reviews the beach closure data to confirm that the closures were due to water quality data showing exceedance of the SWQS. Beach closures for issues other than water quality (e.g., precautionary closure) are not considered in assessing recreational use support. Table 6.2 summarizes the possible outcomes of the recreational use assessment.

Table 6.2: Recreational Use Assessment Results

Data Assessment Results	**Use Assessment Results***
a) Beach closure data does not identify impairment (Primary Contact), AND b) Applicable pathogenic indicator SWQS criteria are met	Use Is Fully Supported
a) Beach closure data identifies impairment* (Primary Contact), OR: b) Applicable pathogenic indicator SWQS criteria are not met	Use Is Not Supported
Neither beach closure nor pathogenic geomean data is available	Insufficient Information

*Note: When determining the spatial extent, a designated bathing beach represents the area within 1,500 feet from the shoreline in the saline coastal (SC) waters, and the area within 200 feet from the shoreline in saline estuarine (SE1) waters. When impaired bathing beaches represent a minute portion of the total area of the assessment unit, generally less than 5% of the AU, the Department may regard the impairment as *de minimus* and consider the recreational use fully supported for the entire assessment unit (see Section 5.0, "De Minimus").

6.3 Fish Consumption Use Assessment Method

The fish consumption use is assessed primarily by comparing fish tissue samples with the thresholds for fish tissue concentrations of specific bioaccumulative toxic pollutants that are used

to develop fish consumption advisories (Table 6.3a). The Department follows USEPA's "Guidance for Assessing Chemical Contaminant Data for Use in Fish Advisories – Volume 1, 2 and 3 (USEPA 2000b) for establishing fish tissue thresholds. The toxic substances that are found in fish tissue, including mercury and chlorinated organic compounds (PCBs, dioxin, chlordane and DDT and its metabolites) are persistent bioaccumulative contaminants. This means that concentrations in fish tissue vary with the age (size) and trophic level (position in the food chain) of the fish. In addition, the persistent chlorinated organic compounds are stored in the lipids and are more likely to be found in fatty fish. Therefore a top trophic level fish that is low in lipids have significant levels of contamination with chlorinated organic compounds only if the levels of contamination in the waterway are very high. Therefore the size, age and species of the fish are significant and need to be considered when assessing the data.

Mercury: The Department has established a threshold of 0.18 ug/g, for mercury in fish tissue, which reflects a "one meal per week" consumption restriction for high risk populations. This threshold is based on the water quality target concentration established in the Department's Statewide Mercury TMDL, which was approved by USEPA on September 25, 2009. (The TMDL report is available on the Department's Web site at: http://www.nj.gov/dep/wms/bear/tmdls.) The mercury threshold for unlimited consumption for the high risk population cannot be attained, based upon the expected mercury concentration in fish tissue that are attributed solely to natural sources that cannot be reduced. Because of these natural sources, it is likely that fish consumption advisories for mercury will continue to be necessary to protect high risk populations even after all anthropogenic sources of mercury have been eliminated.

When evaluating the data for a listing for mercury, a fish tissue sample taken from a small or lower trophic level individual may not be representative of the degree of contamination of the waterway and the overall safety of consuming fish from that waterway. It is difficult to compare fish of different trophic levels and different sizes. The top tropic level species should be used and the fish should be of similar length. Generally the best top trophic level freshwater fish for water assessment in NJ would be Largemouth Bass, *Micropterus salmoides* and Chain Pickerel, *Esox niger*. These two species are found throughout the New Jersey in almost all waterways and bioaccumulate chemical contaminants.

If tissue samples from top trophic level fish are not available, lower trophic level species can be used to list the waters as impaired for fish consumption if the contaminant levels exceed the advisory level because it can be expected that the top trophic level fish would have higher concentrations of contaminants. If the concentration of mercury in the lower trophic level fish are below the threshold values it cannot be assumed that the top trophic level fish would be below threshold values. Therefore, contaminant concentrations below the advisory concentrations in lower trophic level fish cannot be used to determine attainment.

PCBs, Dioxin, Chlordane, and DDT and its metabolites: Thresholds for fish tissue-based, PCBs, Dioxin, Chlordane, and DDT and its metabolites are intended to protect the high risk population which includes infants, children, pregnant women, nursing mothers, and women of childbearing age. Where fish tissue concentrations are below these thresholds, fish consumption is unrestricted.

Benthic omnivores that are very lipid rich species should be sampled for these contaminants. American Eel, *Anguilla rostrata*, and Carp, *Cyprinus carpio*, are the species that make the best indicators of contamination by chlorinated organic compounds, followed by Bullhead *Ictalurus spp* and Channel Catfish *Ictalurus punctatus* (where available). Channel Catfish are largely piscivorous but limited in distribution. Carp are very abundant everywhere and Bullhead (Brown and Yellow) are available but difficult to collect. American Eel are found in most lakes, rivers and streams throughout New Jersey and are the species that can be collected almost everywhere. They come into New Jersey from the ocean as elvers and travel past dams and obstructions to lakes far away from the ocean. They live for about 15 years in freshwater then emigrate out to the Saragasso Sea, spawn and die. While they are here they stay within the confined waterway, therefore are a good indicator despite their complicated life cycle.

The same method as described above for mercury is applicable for assessment of data for PCBs, dioxin, chlordane, and DDT and its metabolites using the appropriate species of fish. As these compounds are also persistent and bioaccumulative the fish should be of similar length to be appropriately evaluated.

Table 6.3a: Thresholds for fish Tissue-based Toxics

Bioaccumulative Toxic Parameter	Tissue Concentration Threshold
Mercury	0.18 ppm(µg/g)
PCBs	8 ppb(µg/Kg)
Chlordane	11.0 ppb(µg/Kg)
Dioxin	0.19 pptr (ηg/Kg)
DDT and Metabolites (DDX)	86.0 ppb(µg/Kg)

In addition to fish tissue concentrations, the Department also evaluates water column data for certain toxic pollutants, where available, to determine compliance with applicable human health criteria. The Department utilizes the human health criteria for SE/SC waters, which are based on "fish consumption only" standards. Consequently, for all SE/SC waters that exceed the human health criteria, the fish consumption designated use is not supporting. These pollutants are identified in Appendix A under "Fish Consumption". Table 6.3b summarizes the possible outcomes of the fish consumption use assessment.

Table 6.3b: Fish Consumption Use Assessment Results

Data Assessment Results	Use Assessment Result
a) In all waters, fish tissue concentrations of appropriate top trophic level fish species are below the applicable thresholds for all parameters, AND b) In SE/SC waters only, there are no exceedances of the human health criteria for selected parameters in the water column	Use is Fully Supported
a) In all waters, fish tissue concentrations (any trophic level) exceed the applicable threshold for one or more parameters; OR b) In SE/SC waters only, one or more selected parameters in the water column exceed the applicable human health criteria	Use is Not Supported
Neither fish tissue of appropriate species nor water column data is available	Insufficient Information

6.4 Shellfish Harvest for Consumption Use Assessment Method

The shellfish harvest for consumption use is designated in all waters classified as SC and SE1. The shellfish sampling and assessment program is overseen by the federal Food and Drug Administration (FDA) and administered through the National Shellfish Sanitation Program (NSSP) to ensure the safe harvest and sale of shellfish. The NSSP's guidance, entitled *National Shellfish Sanitation Program Guide for the Control of Molluscan Shellfish,* is available on the FDA's Web site at http://www.fda.gov. The Department's Bureau of Marine Water Monitoring determines shellfish classifications based on sampling data and assessment procedures in the NSSP manual. Waters are classified as approved ("unrestricted"), special restricted, special seasonal restricted, seasonally approved, or prohibited for harvest. The legal description of shellfish classification areas is updated annually in the Shellfish Growing Water Classification rules at N.J.A.C. 7:12. The Department's shellfish classification areas are included in the SWQS by reference at N.J.A.C. 7:9B-1.12.

Administrative closures of shellfish waters are established in restricted areas around potential pollution sources, such as sewage treatment plant outfalls, marinas, and outfalls as a preventive measure to avoid the harvest of shellfish that could become contaminated by sewage, boat wastes or stormwater runoff. Where shellfish harvest is prohibited due to an administrative closure, such prohibited areas are not included in the overall shellfish use assessment. Where shellfish harvest is special restricted or seasonal due to an administrative closure, such restricted areas are not based on water quality and are regarded as "insufficient information".

Only assessment units containing shellfish waters classified as unrestricted are assessed as fully supporting the shellfish harvest for consumption use. This assessment method is very conservative and should not be used to determine the status relative to harvesting of shellfish.
The official adopted Shellfish Classification maps should be referenced for the actual areas approved for shellfish harvest, unrestricted or with restrictions. All other shellfish waters are assessed as not supporting the shellfish harvest for consumption use and the pollutant causing the waters to be prohibited for harvest (total coliform) is identified on the 303(d) List. Table 6.4 summarizes the possible outcomes of the use assessment for the shellfish harvest use.

Table 6.4: Shellfish Harvest for Consumption Use Assessment Results

NSSP Classification	Assessment Results*
Unrestricted, Approved	Use Is Fully Supported *
Prohibited, Special Restricted, or Seasonal classifications based on water quality	Use Is Not Supported
Sufficient total coliform data is not available. Any restrictions are based on administrative closures.	Insufficient Information

*Note: When the area classified as prohibited, special restricted or seasonal represents a minute portion of the total area of the assessment unit, generally less than 5% of the AU, the Department may regard the impairment as *de minimus* and consider the shellfish harvest for consumption use fully supported for the entire assessment unit (see Section 5.0, "De Minimus").

6.5 Public Water Supply Use Assessment Method

The public water supply use is defined as waters that are potable after conventional filtration treatment and disinfection, without additional treatment to remove other chemicals. All FW2 and PL waters are designated as drinking water supply use. It is important to note that many waterbodies do not have drinking water intakes due to stream size and other considerations. The public water supply use is assessed primarily by comparing concentrations of associated chemical parameters (see Appendix A) to the applicable SWQS criteria. Nitrate is the only parameter for which there must be data to assess the water supply use; however, other parameters (for example, arsenic, cadmium, chromium, copper, cyanide, lead, mercury, thallium, zinc, chloride, radioactivity, and volatile organic compounds) are also used to assess the water supply use when sufficient data for these parameters is available.

The Department also evaluates monitoring data from treated or finished water supplies, where available, to determine compliance with the Safe Drinking Water Act's National Primary Drinking Water Regulations (NPDWRs, or primary standards). Pollutants monitored for the protection of human health under the primary standards include volatile organic compounds, semi-volatile organic compounds, inorganic constituents, salinity, radioactive constituents, and disinfection by-products. Use restrictions include closures, contamination-based drinking water supply advisories, better than conventional treatment requirements, and increased monitoring requirements due to confirmed detection of one or more pollutants.

Water supply use restrictions established by the Department's Bureau of Safe Drinking Water in response to documented violations of the Safe Drinking Water Act (SDWA) may also be considered in assessing drinking water supply use support. Only violations that can be attributed to surface water sources are considered. Violations for copper and lead, which may be attributed to the collection system, are not used in assessing source water unless the violations occur in ambient waters.

Table 6.5 summarizes the possible outcomes of the drinking water supply use assessment. Since human health concerns associated with bioaccumulative constituents are generally addressed through consumption advisories, the Department reviews exceedances of human health criteria for such constituents to determine which use is not supported: the drinking water supply use, the fish consumption use, or both.

Table 6.5: Public Water Supply Use Assessment Results

Assessment Outcomes	Assessment Results
SWQS criteria are met for all associated parameters, waters are not threatened, AND there are no SDWA closures or use restrictions,	Use is Fully Supported
SWQS are exceeded for one or more associated parameters, waters are threatened, OR there are one or more SDWA closures or use restrictions	Use is Not Supported
Sufficient nitrate data is not available	Insufficient Information

6.6 Agricultural Water Supply Use Assessment Method and Industrial Water Supply Use Assessment Method

The Department has determined that it will no longer assess support of Agricultural and Industrial Water Supply Uses separately from the Drinking Water Supply Use because the Department has not promulgated surface water quality criteria specific to Agricultural and Industrial Water Supply Uses. In prior years, non-promulgated, literature-based thresholds were used to assess these uses even though it is not appropriate to apply non-promulgated water quality criteria to implement regulatory, enforceable actions. These thresholds were less stringent than the promulgated criteria for the same parameters associated with the Aquatic Life and Public Water Supply Uses. Therefore, if the Aquatic Life and Public Water Supply Uses are fully supported, these other water supply uses are also fully supported.

This revised approach does not result in any delisting from the 303(d) list since the Aquatic Life criterion for TSS and pH are the same or more stringent, respectively, than those used for Industrial Water Supply Use. In addition, no waters were listed on the 303(d) List based on an exceedance of the TDS threshold used to assess the Agricultural Water Supply Use. Therefore these parameters (TSS, pH, TDS) continue to remain on the 303(d) List for exceeding the criteria for Aquatic Life Use or Public Water Supply Use.

7.0 Integrated Listing Guidance

New Jersey assigns individual water quality assessments in five categories (1,2,3,4, and 5), based upon EPA guidance. For each assessment unit, available water quality data for each parameter are compared to the criteria for that parameter. The Department has chosen to use the term "sublist" rather than "category" when referring to the Integrated List, to avoid confusion between Category 1 of the Integrated List and Category One Waters designated under New Jersey's SWQS at N.J.A.C. 7:9B. In addition, New Jersey has modified these categories to add subparts to Sublist 5 based on EPA guidance to help clarify the response strategy for impairments. The sublists used to identify an assessment unit on the Department's Integrated List are described below.

Sublist 1: An assessment unit is fully supporting all applicable designated uses and no uses are threatened. (The Department does not include the fish consumption use for determining placement on this sublist.)

Sublist 2: The assessment unit is fully supporting the designated use but is not supporting all applicable designated use(s).

Sublist 3: Insufficient data and information are available to determine if the designated use is fully supported.

Sublist 4: One or more designated uses are not supported or are threatened but TMDL development is not required because of one of the following reasons:

A. A TMDL has been completed for the parameter causing use non-support.
B. Other enforceable pollutant control measures are reasonably expected to result in fully supporting the designated use in the near future.
C. Non-support of the designated use is caused by something other than a pollutant.

Sublist 5: One or more designated uses are not supported or are threatened by a pollutant(s), that requires development of a TMDL, according to the CWA. Nevertheless, TMDL development is not an effective means to advance water quality improvement in all circumstances. The subparts described below have been developed to make clear the Department's intention with respect to development of a TMDL.

A. Designated use is not supporting due to arsenic which is present at levels below that determined to be attributable to naturally occurring geology/ soil.

Explanation: Arsenic is present at levels that exceed the established human health criterion in several locations throughout the State. It is known that, in many locations, levels in excess of the human health criterion are present due to naturally occurring geology and soil. Since 2003, the Department has worked with the United States Geological Survey (USGS) to investigate arsenic levels that were expected to represent natural conditions based on geology, monitoring of ground water in aquifers, surface water, and soil samples, including speciation between arsenic (V)

and arsenic (III). Based on these USGS studies (referenced in Section 11.1), it was determined that the natural range of arsenic is 0.24-0.61 ug/l in the Outer Coastal Plain and 0.36-0.70 ug/l for the Inner Coastal Plain. When determining if a sampling location in the Outer or Inner Coastal Plain exceeds natural conditions, the higher limit of the natural range is used. Because naturally occurring levels of As cannot be reduced, a TMDL is not appropriate USGS is continuing to study other regions and when the naturally occurring levels of As are identified in other regions, these findings will be reflected when determining impairment status in subsequent 303(d) listing cycles.

L. Designated use is not supporting due to legacy pollutants.

Explanation: Impairments that are attributed to parameters that are banned from production or use are placed on this subpart. The cause of these impairments is historical in nature; these pollutants linger in the environment long after new anthropogenic sources have ceased. Thus, the TMDL/regulatory response path envisioned under the CWA is not an effective means to address these impairments. Instead, follow-through on site remediation plans, development/implementation of pollutant minimization plans for incidental introduction into regulated discharges and natural attenuation are the main mechanisms for reduction. Parameters such as PCBs, dioxins, DDT and metabolites would fall in this category.

R. Designated use is not supporting and restoration activities have been identified in an approved Watershed Based Plan to address the parameter for which water quality standards are not attained.

Explanation: The Department has approved Watershed Based Plans (WBPs) in several locations throughout the State. The focus of WBPs is sources that are nonpoint or regulated stormwater, where source control through implementation of best practices is the most effective means to reduce loads. Similar to a TMDL, a WBP identifies the sources of a pollutant, the relative contribution and the load reduction needed to attain SWQS. A WBP goes on to identify the specific actions that would need to be undertaken to reduce loads of the pollutant of concern to levels that comport with attaining SWQS. Implementation of these watershed restoration plans is expected to improve water quality without the need for a TMDL, if one has not yet been developed. The WBP load reduction measures depend largely on actions that could be implemented using 319(h), Farm Bill and other funding sources and/or stewardship activities. Therefore, Sublist 4B is not applicable, as measures are largely not enforceable. Instead, in locations where the sources are nonpoint or stormwater in nature and nonregulatory measures are the primary means available to reduce the loads, the Department will opt to pursue restoration

and stewardship actions directly as the preferred path to reduce loads and attain water quality standards.

The 2014 Integrated List shows the use assessment results for each applicable designated use in each assessment unit and, for each use that is not supported, the Integrated List identifies the parameter "cause" and TMDL status for that cause or causes. USEPA's ADB further distinguishes between pollutant causes that require a TMDL (Category 5) and pollutant causes for which TMDLs have already been approved (Category 4A). In some cases, a regulatory response outside of a TMDL is permissible and the waterbody/pollutant combination is assigned to Category 4B in ADB (TMDL alternative). Where TMDLs have been approved, the assessment unit/pollutant combination is removed from the 303(d) List (see Section 7.2) and reassigned in ADB from Category 5 to Category 4A. The Integrated List shows such assessment units as "not supporting" those uses and shows the date completed under TMDL status for the corresponding cause. Only assessment unit/pollutant combinations for which a TMDL is indicated in accordance with the CWA is placed on the 303(d) List (see Section 7.1). The assessment unit/pollutant combinations that meet this criterion are further differentiated in accordance with the Sublist 5 subparts to indicate whether a TMDL is an appropriate response, as described above. Assessment unit Sublist 5 subpart placement will be reconsidered in subsequent cycles to determine if implementation measures have not been effective, circumstances have changed and/or a regulatory response becomes indicated.

7.1 Identifying Causes and Sources of Non-Support (303(d) List)

The List of Water Quality Limited Segments (303(d) List) is comprised of assessment unit/pollutant combinations, of which the "pollutant" is the chemical parameter (i.e., "pollutant") causing non-support of the applicable designated use. A pollutant is considered to be the cause of use non-support if it is associated with the designated use (see Appendix A) and it exceeds the applicable SWQS criterion.

If chemical data are unavailable or show no exceedance of applicable criteria, but biological data indicate impairment, the cause of Aquatic Life Use (general or trout) non-support is identified on the 303(d) List as "cause unknown". Where biological data indicate impairment and chemical data show exceedance(s) of applicable criteria, the chemical parameter(s) is identified as pollutant causes in ADB and placed on the 303(d) List; "cause unknown" is identified as a "non-pollutant" cause of Aquatic Life Use non-support in ADB and in the Integrated List of Waters (Appendix A), but are not identified on the 303(d) List.

A source assessment is conducted for each pollutant identified on the 303(d) List as causing non-support. "Suspected" sources of pollutants causing impairment are identified using the Department's Geographic Information System (GIS). A more thorough investigative study will be conducted through the TMDL and/or WBP process to determine the specific sources, and relative contributions, of the pollutant(s) and nonpoint sources causing use non-support.

7.2 Delisting Assessment Unit/Pollutant Combinations

There are specific scenarios under which USEPA allows states to remove an assessment unit/pollutant combination from the List of Water Quality Limited Segments (303(d) List), a process commonly referred to as "delisting". Appendix C of the 2014 Integrated Report identifies all assessment unit/pollutant combinations delisted from the 2014 303(d) List and the corresponding reason for each delisting action. Table 7.2 displays the subset of ADB delisting codes and associated reasons applied by New Jersey for the 2014 Integrated List.

Table 7.2: Delisting Codes and Associated Reasons

ADB Delisting Code	Delisting Reason
2	Flaws in original listing
3	TMDL Alternative (4B)
4	Not caused by a pollutant (4C)
5	TMDL approved or established by EPA (4A)
8	Applicable WQS attained; due to restoration activities
9	Applicable WQS attained; due to change in WQS
10	Applicable WQS attained; according to new assessment method
11	Applicable WQS attained; original basis for listing was incorrect
12	Applicable WQS attained; threatened water no longer threatened
13	Applicable WQS attained; reason for recovery unspecified
14	Data and/or information lacking to determine water quality status; original basis for listing was incorrect

8.0 Method to Rank and Prioritize Assessment Units That Do Not Fully Support Designated Uses

Section 303(d) of the federal Clean Water Act requires states to rank and prioritize assessment units that require development of TMDLs. The goal of priority ranking is to focus available resources on developing TMDLs in the most effective and efficient manner, while taking into account environmental, social, and political factors. Assessment units ranked as high (H) priority for TMDL development, based on the factors outlined below, are those the Department expects to complete within the next two years. Assessment units ranked as medium (M) priority are those the Department expects to complete in the near future, but not within the next two years. Assessment units ranked as low (L) priority are those the Department does not expect to complete in the immediate or near future. All assessment unit/pollutant combinations associated with Subparts A, L or R of Sublist 5 are included in the low priority category for reasons described in Section 7.0. The Department prioritizes remaining assessment unit/pollutant combinations identified on the 303(d) List and schedules them for TMDL development based on the following factors:

- TMDL complexity regarding data or modeling needs;

- Severity and/or spatial extent of the actual or threatened exceedance/impairment;
- Nature of the designated uses not being supported (i.e., aquatic life, recreational, economic, cultural, historic, and aesthetic importance);
- Efficiencies that could result from grouping TMDLs by drainage basin or parameter or leveraging other ongoing water quality studies, including in shared waters;
- Status of TMDLs currently under development;
- Degree of public interest and support for addressing particular assessment units.

9.0 Method for Developing the Monitoring and Assessment Plan

The Integrated Report guidance (USEPA, 2005) recommends that states include descriptions and schedules of additional monitoring needed to: 1) assess all designated uses in all assessment units, and 2) support development of TMDLs for all assessment unit/pollutant combinations identified as not attaining designated uses. New Jersey's future monitoring plans and needs are set forth in New Jersey's Water Monitoring and Assessment Strategy, which is available on the Department's Web site at http://www.state.nj.us/dep/wms/longtermstrategyreport.pdf.

The Department's goal for water monitoring and assessment is to make assessment decisions using high quality datasets that accurately reflect ambient water quality conditions on a region-wide basis. By using comprehensive, high quality datasets and multiple lines of evidence such as ambient water quality data, biological data, habitat data, and hydrological data as well as other relevant lines of evidence, the Department is able to make assessment decisions with a high degree of confidence that assists in identifying and addressing water resource concerns affecting targeted regions. It is important to recognize that monitoring and assessing the different regions of the state requires significant effort and can only be accomplished over the long term.

10.0 Public Participation

The public is afforded the opportunity to participate in three key phases of development of the Integrated Report: 1) submission of data, 2) review and comment on the proposed assessment methods; and 3) review and comment on the proposed Integrated List and 303(d) List. Section 10.1 explains the Department's process for soliciting data for use in the Integrated Report. The Department also strives to continuously interact with other data collecting organizations and facilitate the exchange of data and information.

Section 10.2 explains the Department's process for announcing public availability of the draft Methods Document, draft Integrated List, and draft 303(d) List for review and comment prior to adoption of the final Methods Document and Lists. As explained in Chapter 1, the Integrated Report combines the reporting requirements of Sections 305(b) and 303(d) of the federal Clean Water Act. The 303(d) List component of the Report, which satisfies the reporting requirements of Section 303(d), includes the assessment units identified as not supporting one or more designated uses, the pollutants causing non-support of those assessment units, and their priority

ranking for TMDL development. The public participation requirements of these two components are different. The 303(d) requirements are considered regulatory requirements because they trigger TMDL development. Therefore, the regulatory requirements identified in this section regarding public participation, USEPA approval, and adoption apply only to the 303(d) List component of the Integrated Report.

The Department is required under 40 CFR 130.7(b)(6) to provide a description of the methodology used to develop the 303(d) List. This Methods Document lays out the framework for assessing data and uses, entering the results into USEPA's ADB, and publishing those results as reports out of ADB that represent the Integrated List and 303(d) List. The Department develops a draft Methods Document that is made available for public review and comment through public notification, as outlined below. After finalizing the Methods Document, the Department assesses the data in accordance with those methods and develops the Integrated Report, which includes the draft Integrated List, draft 303(d) List, and two-year TMDL Schedule. A public notice is published in the New Jersey Register and newspapers of general circulation announcing that the Methods Document has been finalized and the draft Integrated List and draft 303(d) List are available for public review and comment. The Integrated List and 303(d) List are revised, as appropriate, after full consideration of comments received. The public participation procedures related to proposal and adoption of the Integrated List and final 303(d) List are outlined in Section 10.2 below.

10.1 Request for Data

The Department pursues several avenues for notifying the public of its intent to seek water quality-related data and information from external partners, including notices published in the New Jersey Register, publication on the Department's Web site and email to interested individuals and organizations. The time period for submitting data is specified in the public notice. The data solicitation notice for the 2014 Integrated Report established a data collection deadline of December 31, 2012 and a data submission deadline of July 1, 2013. A cut-off date for data submission is necessary to allow the data to be received, analyzed, and assessed for timely completion of the Integrated Report and submission of the Integrated List and 303(d) List to USEPA by April 1 of even-numbered years. Data collected or submitted after the respective deadlines may be considered for subsequent 303(d) Lists and/or other water quality assessments conducted by the Department.

10.2 Public Notification

Public Notices: The Department will publish a notice announcing the availability of the draft Methods Document for public review and requesting comments. The Department may revise the Methods Document based on public comment.

The Department proposes the 303(d) List of Water Quality Limited Waters as an amendment to the Statewide Water Quality Management Plan, providing an opportunity for public comment, and adopts the amendment in accordance with N.J.A.C. 7:15-6.4. A public notice announcing availability of the proposed 303(d) List for public review and comment shall be published in the New Jersey Register and on the Department's Web site. The public notice shall include a

description of the procedures for comment; and the name, address, and Web site of the Department office or agent from which the proposed document may be obtained and to which comments may be submitted. The public notice for the draft 2014 303(d) List also notifies the public that the Department has finalized the 2014 Methods Document. The final Methods Document, including agency responses to public comments, is included as an Appendix to the 2014 Integrated Report.

Comment Period: The comment period shall be a minimum of 30 days.

Public Hearings: Within 30 days of publication of the public notice, interested persons may submit a written request to extend the comment period for an additional 30 days, or request a public hearing. If the Department determines that there are significant environmental issues or that there is a significant degree of public interest, the Department may hold a public hearing and/or extend the comment period. If granted, a notice announcing extension of the comment period and/or public hearing is published promptly on the Department's Web site.

Final Action: After the close of the public comment period for the Methods Document, the Department addresses the comments and publishes the final Methods Document on the Department's Web site along with the Response to Comments. After the close of the public comment period for the proposed 303(d) List, the Department addresses the public comments, makes any necessary revisions, and prepares a final 303(d) List. The Department submits the final 303(d) List to USEPA Region 2 in accordance with 40 CFR 130.7. Upon receipt of a response from USEPA Region 2, the Department may amend the final list based on their comments. The Department adopts the final 303(d) List as an amendment to the Statewide Water Quality Management Plan by placing a notice in the New Jersey Register and on the Department's Web site. However, the Department may re-propose the 303(d) List if the Department determines that revisions made in response to USEPA Region 2 comments result in substantive changes that should be subject to public review and comment.

Availability of Final Documents: The Integrated Report, which includes the Integrated List, monitoring needs and schedules, TMDL needs and schedules, and any other information usually included in the 305(b) Report, is submitted to the USEPA Region 2 as required by Section 305(b) of the federal Clean Water Act. The Department posts the availability of the final Integrated Report and the 303(d) List on its Web site after receipt of approval from the USEPA.

11.0 Literature Cited and Additional References

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Appendix A: Parameters Associated With Each Designated Use

Parameter	Aquatic Life (general and trout)	Recreation	Public Water Supply	Shellfish Harvest for Consumption	Fish Consumption
Ammonia, un-ionized	X				
Acenaphthene			X		X
Acrolein			X		X
Acrylonitrile			X		X
Aldrin	X		X		X
Anthracene			X		X
Antimony			X		X
Arsenic			X		X
Asbestos			X		
Barium			X		
Beach Closure Data		X			
Benz(a)anthracene			X		X
Benzene			X		X
Benzidine			X		X
3,4-Benzofluoranthene (Benzo(b)fluoranthene)			X		X
Benzo(k)fluoranthene			X		X
Benzo(a)pyrene (BaP)			X		X
Beryllium			X		X
alpha-BHC (alpha-HCH)			X		X
beta-BHC (beta-HCH)			X		X
gamma-BHC (gamma-HCH/Lindane)	X		X		X
Biological Community Data	X				
Bis(2-chloroethyl) ether			X		X
Bis(2-chloroisopropyl) ether			X		X
Bis(2-ethylhexyl) phthalate			X		X

Parameter	Aquatic Life (general and trout)	Recreation	Public Water Supply	Shellfish Harvest for Consumption	Fish Consumption
Bromodichloromethane (Dichlorobromomethane)			X		X
Bromoform			X		X
Butyl benzyl phthalate			X		X
Cadmium	X		X		X
Carbon tetrachloride			X		X
Chlordane in Water Column	X		X		
Chlordane in Fish Tissue					X
Chloride			X		
Chlorine Produced Oxidants (CPO)	X				
Chlorobenzene			X		X
Chloroform			X		X
2-Chloronaphthalene			X		X
2-Chlorophenol			X		X
Chlorpyrifos	X				
Chromium			X		X
Chromium+3	X				
Chromium+6	X				
Chrysene			X		X
Copper	X		X		
Cyanide (Total)	X		X		X
4,4'-DDD (p,p'-TDE)			X		X
4,4'-DDE			X		X
4,4'-DDT	X		X		X
Demeton	X				
Dibenz(a,h)anthracene			X		X

Parameter	Aquatic Life (general and trout)	Recreation	Public Water Supply	Shellfish Harvest for Consumption	Fish Consumption
1,2-Dichlorobenzene			X		X
1,3-Dichlorobenzene			X		X
1,4-Dichlorobenzene			X		X
3,3'-Dichlorobenzidine			X		X
1,2-Dichloroethane			X		X
1,1-Dichloroethylene			X		X
trans-1,2-Dichloroethylene			X		X
2,4-Dichlorophenol			X		X
1,2-Dichloropropane			X		X
1,3-Dichloropropene (cis and trans)			X		X
Dieldrin	X		X		X
Diethyl phthalate			X		X
2,4-Dimethyl phenol			X		X
4,6-Dinitro-o-cresol			X		X
2,4-Dinitrophenol			X		X
2,4-Dinitrotoluene			X		X
1,2-Diphenylhydrazine			X		X
Dissolved Oxygen	X				
E. Coli (freshwater)		X			
Endosulfans (alpha and beta)	X		X		X
Endosulfan sulfate			X		X
Endrin	X		X		X
Endrin aldehyde			X		X
Enterococci (saline)		X			
Ethylbenzene			X		X
Fecal Coliform (saline)		X*			

Parameter	Aquatic Life (general and trout)	Recreation	Public Water Supply	Shellfish Harvest for Consumption	Fish Consumption
Fluoranthene			X		X
Fluorene			X		X
Guthion	X				
Heptachlor	X		X		X
Heptachlor epoxide	X		X		X
Hexachlorobenzene			X		
Hexachlorobutadiene			X		X
Hexachlorocyclopentadiene			X		X
Hexachloroethane			X		X
Indeno(1,2,3-cd)pyrene			X		X
Isophorone			X		X
Lead	X		X		
Malathion	X				
Manganese					X
Mercury in Water Column	X		X		
Mercury in Fish Tissue					X
Methoxychlor	X		X		
Methyl bromide (bromomethane)			X		X
Methyl t-butyl ether (MTBE)			X		
Methylene chloride			X		X
Mirex	X				
Nickel	X		X		X
Nitrate (as N)			X		
Nitrobenzene			X		X
N-Nitrosodi-n-butylamine			X		X
N-Nitrosodiethylamine			X		X
N-Nitrosodimethylamine			X		X

Parameter	Aquatic Life (general and trout)	Recreation	Public Water Supply	Shellfish Harvest for Consumption	Fish Consumption
N-Nitrosodiphenylamine			X		X
N-Nitrosodi-n-propylamine (Di-n-propylnitrosamine)			X		X
N-Nitrosopyrrolidine			X		X
Parathion	X				
Pentachlorobenzene			X		X
Pentachlorophenol	X		X		X
pH (Standard Units)	X		X		
Phenol			X		X
Phosphorus, Total	X				
Polychlorinated biphenyls (PCBs) in Water Column	X		X		
PCBs in Fish Tissue					X
Pyrene			X		X
Radioactivity			X		
Salinity					
Selenium	X		X		X
Shellfish Closures				X	
Silver	X		X		X
Solids, Suspended (TSS)	X				
Solids, Total Dissolved (TDS)	X^{+}		X		
Sulfate			X		
Sulfide-hydrogen sulfide (undissociated)	X				
Temperature	X				
1,2,4,5-Tetrachlorobenzene			X		X
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)			X		X

Parameter	Aquatic Life (general and trout)	Recreation	Public Water Supply	Shellfish Harvest for Consumption	Fish Consumption
1,1,2,2-Tetrachloroethane			X		X
Tetrachloroethylene			X		X
Thallium			X		X
Toluene			X		X
Total Coliform				X	
Toxaphene	X		X		X
1,2,4-Trichlorobenzene			X		X
1,1,1-Trichloroethane			X		X
1,1,2-Trichloroethane			X		X
Trichloroethylene			X		X
2,4,5-Trichlorophenol			X		X
2,4,6-Trichlorophenol			X		X
Turbidity	X				
Vinyl chloride			X		X
Zinc	X		X		X

* secondary contact recreation only
+ pineland waters only

Appendix B

Comments and Agency Responses on the Draft 2014 Water Quality Monitoring and Assessment Methods (Methods Document)

This constitutes the New Jersey Department of Environmental Protection's (Department) response to comments submitted during the public comment period for the document entitled, "2014 Integrated Water Quality Monitoring and Assessment Methods" (Methods Document), which was published on the Department's Web site at http://www.state.nj.us/dep/wms/bwqsa/2014_integrated_report.htm on July 21, 2014. A public notice seeking comments on the Draft Methods Document was also published in the New Jersey Register on that date. The Methods Document was also made available upon request by mail.

The following organizations (listed alphabetically) submitted written comments on the draft 2014 Methods Document:

1) L. Stanton Hales, Jr., Ph.D., Barnegat Bay Partnership, Ocean County College, College Drive, PO Box 2001 Toms River, NJ 08754 (BBP)
2) Cindy Zipf, Clean Ocean Action, 18 Hartshorne Drive, Highlands, NJ 07732 (COA)
3) Patricia Kehrberger, Kehrberger & Associates, 8 Barnes Drive, Waldwick, NJ 07463
4) Britta Wenzel, Save Barnegat Bay, PO Box 155, Lavallette, NJ 08725 (SBB)
5) Brent Gaylord, U.S. Environmental Protection Agency, Region 2, 290 Broadway, New York, NY 10007

A summary of comments on the draft 2014 Methods Document and the Department's responses to those comments follows. The initials in brackets at the end of each comment correspond to the commenters listed above.

General

1. **Comment**: The document reflects a lot of work and the progress that the field of monitoring and assessment has experienced in recent years. The effort by you and your New Jersey Department of Environmental Protection colleagues is appreciated. (3)

   Response: The Department acknowledges the commenter's support.

2. **Comment**: "Under CWRM, the Department has organized its water program operations to consider water resource issues on a *regional, integrated and holistic basis*." Does this mean DEP will look at the items listed in the next paragraph: *hydrology, geology, land use, biological habitat conditions, meteorology, restoration activities, point and nonpoint sources, use designation, stream classification, and other relevant environmental considerations to determine overall water quality*? (5)

   Response: The juxtaposition by the commenter of the two phrases confounds the intended meaning of each phrase. Comprehensive water resource management (CWRM) includes but is not limited to the comprehensive assessment process. As articulated in Section 2.0, the Department's Integrated Assessment process was expanded in 2012 to include a more comprehensive assessment of designated use support that incorporated water quality data along with the additional factors mentioned by the commenter. The application of this approach was limited to locations where the initial data analysis suggested a change in assessment decision may be appropriate. The draft 2014 Methods Document explains that, beginning with the 2014 cycle, the comprehensive assessment will be applied to a selected

water region each listing cycle, and will consider the suite of factors affecting the interpretation of water quality data within each assessment unit in the targeted water region. This approach will result in a comprehensive assessment of the entire state every 10 years. This approach is consistent with EPA's 303(d) Long-term Vision and Integrated Report guidance, NJ's Barnegat Bay Initiative and CWRM.

Inter-Departmental Coordination

3. **Comment**: It is strongly urged that the Department coordinate and integrate across Departments as rule, program, and permit changes are considered. In the summer of 2014 alone, the Department made substantive changes to coastal rules and is considering ocean discharge permit renewals for wastewater treatment plants. These decisions all present potential ramifications for water quality and coastal health and must not be made in a vacuum. Changes in policy, planning, and development may be cumulative and synergistic, and may hasten decline of impaired waterways, or even reverse improvements made through watershed based planning. (2)

   Response: As explained in Section 1.1, the purpose of the 2014 Methods Document is to describe the methods used to collect, analyze, and interpret data to determine compliance with applicable water quality standards and assess support of applicable designated uses. The Department does coordinate the regional comprehensive assessment process among the various water programs. Rules, program, and permit changes are beyond the scope of the Methods Document. Nevertheless, it should be noted that the Department does coordinate water resource management activities conducted throughout the Department under the CWRM approach. As an example, under the Barnegat Bay Initiative, the 10 Point Action Plan sets forth a coordinated effort to identify and solve water quality and natural resource issues of concern in the bay.

4. **Comment**: The 2014 Methods Document must be improved before finalizing. The undersigned groups are frustrated by the time that has elapsed in addressing key water quality improvements, particularly in estuarine waters. The Methods Document should be revised to support immediate assessment of the most imperiled coastal waters, rather than allow their continued deterioration while translators and indices are under development. We request a written response. (2)

   Response: It is unclear what the commenter means by "the Methods Document must be improved before finalizing." The Methods Document explains the methods used to collect, analyze, and interpret data to determine compliance with applicable water quality standards and assess support of applicable designated uses. The assessment process must utilize approved standards and indices. The Methods Document cannot be used to establish new standards and is not a vehicle to implement restoration measures. The resulting assessment decisions can and do help direct the Department's efforts to develop and implement measures that will result in restoring water quality to the standards set forth in the SWQS rules.

   While the Department has identified the need to develop new indices to better assess estuarine and other waters, those indices are still under development. Once new indices have been fully developed and approved, assessment methods based on those indices will be proposed in a future methods document.

   With respect to the suggestion that imperiled coastal waters should be immediately assessed, it should be noted that all waters for which there is sufficient data are assessed in each biennial assessment. State water quality assessments are performed biennially per federal requirements and are normally based upon five broad types of monitoring data: biological integrity, chemical, physical, habitat, and toxicity.

Each type of data yields an assessment that must then be integrated with other data types for an overall assessment. All publicly available data are required to be gathered and sufficient time is required to be provided to the data collectors to validate and submit the data to the portals such as WQDE or STORET or NWIS. As per the federal requirement, the Department will continue to perform state-wide assessments every two years and as indicated in the Methods Document.

While there is a lag between the time frame of the data used for assessment for developing the 303(d) list, in order to allow for assurance of data quality, recording and compilation of the data and to apply the assessment procedures, the Department does performs real-time assessment for other purposes. For example, the Department's cooperative coastal monitoring program provides real-time assessment for pathogens in the beaches (https://www.njbeaches.org/).

Data Assessment and Use

5. **Comment**: It is stated that a number of sources will be providing data for the assessments and that this data may be stored in one of at least three databases—WQDE, STORET and NWIS. Will the entry for *each* assessment unit in the 303(d) list indicate which database contains the data on which the assessment was based, so that one will not have to search all three databases to find the data relevant to a specific AU? (5)

   Response: For the 2014 assessment, all data have been downloaded from the National Water Quality Monitoring Council Water Quality Portal at http://www.waterqualitydata.us which includes data from WQDE/STORET and NWIS with the exception of continuous, biological, beach closures and other data types that are not yet supported by these electronic data repositories. The data used for 2014 assessment is available from the Department upon request. The USEPA has been working with states to better coordinate and integrate data access and integration systems access. EPA's redesign of The Assessment, TMDL Tracking and ImplementatioN System (ATTAINS) database and other data systems is not expected to be available until the 2016 listing cycle, at the earliest.

   Since the Department downloads and assesses this huge amount of data in one "batch" using various computer-based processes, it is impracticable to identify the database that contains the data on which the assessment was based, for *each* assessment unit on the 303(d) list. Instead, the Integrated Report will include a table of data sources, which identifies the types of data submitted by various entities and whether they were used or not (and if not, the reason why) for the assessment process. As has been done for previous cycles, the Department also identifies the stations and data sets used to make each new listing and delisting decision using the comment fields in EPA's ADB assessment database. The Department believes these tools and the Methods Document procedures adequately inform interested parties as to what data has been used and in what way for each assessment decision. The Department is available to clarify any specific questions that may arise that have not been addressed through the tools provided.

6. **Comment**: Page 13: "If current data is not sufficient for an assessment decision, past assessments are considered valid until new data show that conditions have changed." Will any distinction be made between an unassessed AU and one where data was obtained but was not sufficient for an assessment decision? (5)

   Response: The commenter is referring to a scenario under which the prior assessment would be carried over to the present cycle because there is no or insufficient new data to support a new assessment. Under this scenario, the AU is still considered "assessed" based on the prior assessment decision and the

assessment outcome is either "Fully Supporting" or "Not Supporting" the designated use. An unassessed AU is one where there is insufficient or no data to support an assessment of the designated use, which is distinguished from the described scenario, and, in which case, the assessment outcome is "Insufficient Information".

7. **Comment**: Does the Department plan to propose methods that will outline the minimum requirements needed in order to demonstrate that natural conditions for conventional parameters are occurring? (5)

   Response: The SWQS at N.J.A.C 7:9B-1.5(c) state, "Natural water quality shall be used in place of the promulgated water quality criteria of N.J.A.C. 7:9B-1.14 for all water quality characteristics that do not meet the promulgated water quality criteria as a result of natural causes." The Department believes that the criteria for making a decision regarding natural conditions is already explained in the Methods Document. Section 3.2 of the draft Methods Document provides examples of "natural causes" (i.e., natural conditions) as locations where underlying conditions (e.g., geology, hydrology) influence the water chemistry or there are no anthropogenic sources or potential anthropogenic sources are determined not to be sources of the pollutant in question. The Methods Document also explains that data that do not meet applicable SWQS criteria potentially due to natural conditions will be carefully evaluated and any excursions attributed to natural conditions will be documented. This evaluation has been conducted on a case-by-case basis based on the weight of evidence and best professional judgment. It is not clear that anticipating hypothetical circumstances and creating a procedure for each parameter in advance of a need to do so is an efficient use of resources. As warranted, for example, where multiple determinations of a similar type would be made, the Department will consider developing a template, checklist or other suitable format to routinize the decision process re: natural conditions. The Integrated Report will include documentation of all "Decisions to Not List Assessment Unit/Pollutant Combinations on the 303(d) List of Water Quality Limited Waters" based on natural conditions.

8. **Comment**: The low flow exemption for biological impairments is not acceptable (page 22). How will the determination be made that "low flow" or "very high flood conditions" are, in fact, drought-induced"? (2)

   Response: The Department uses publicly available meteorological data in conjunction with stream flow data provided by the United States Geological Survey. This allows the Department to ascertain when precipitation and resulting stream flows are excessively low or high during the sampling period. These data are used to support observations made in the field by the sampling team who are familiar with the waterway being sampled. Both high and low flows are defined by best professional judgment. Very low flows reflect low frequency events on the flow duration curve. High flows reflect very intense storm events which can be damaging in the short-term to in-stream biological communities.

9. **Comment**: Page 23 - This assessment method described in this section applies only to the wadeable freshwater streams. This method does not address the limiting nutrient factor listed in the EPA approved WQS for TP applicable to NJ's streams. Also, the footnote under the table 4.4 states that "this method does not apply to other waterbody types. For lakes, the Department will assess the general aquatic life use based on compliance with the numeric phosphorus criterion for lakes". How are non-wadeable freshwater steams are being assessed nutrient impacts? Are coastal waters assessed against narrative nutrient standard? (5)

10. **Comment**: Please clarify for Table 4.4. If there is an exceedance of Total Phosphorus, then under any of the circumstances outlined in the table, Total Phosphorus will still be listed as impaired for Aquatic life use? (5)
11. **Comment**: Regarding the Department's nutrient assessment of freshwater streams (p 22-23): The statement, "Freshwaters previously assessed as not attaining the general aquatic life use based solely on exceedance of the numeric phosphorus criteria will be reassessed using the nutrient impact assessment method, where sufficient data are available, and will be delisted for phosphorus if it can be demonstrated that the narrative nutrient criteria are met" is a contradiction to the independent applicability for the Total Phosphorus Numeric Criteria adopted in Department's Water Quality Standards. If the Department would like to use a more weight of evidence approach, the Department would need to adopt a bioconfirmation policy in its Water Quality Standards. (5)
12. **Comment**: Can the Department provide information on its decision to add pH to the Nutrient Impact Assessment Outcomes in Freshwater Wadeable Streams? (5)

Response to comments 9 to 12: Prior Methods Documents have included the method in Section 4.4, and it was initially included in this Methods Document. This method has not been applied in the past and was not used in this listing cycle as the basis for new listing or delisting decisions due to a lack of required data. Section 4.4 in the Methods Document has been removed because of the concerns raised in the past and in the current cycle regarding the use of DO swing and chlorophyll a levels to assign a specific pollutant cause to impaired macroinvertebrate communities.

While the SWQS were amended in 2011 to expand the narrative nutrient criteria to all waters of the State, there are currently no scientifically-accepted translators for applying the narrative criteria to use assessment and listing decisions. Defining the best means to interpret the narrative criteria is an ongoing task as set forth in the Department's Nutrient Criteria Enhancement Plan, which was updated in 2013 and is available on the Department's Web site at http://www.state.nj.us/dep/wms/bwqsa/nutrient_criteria.htm.
Therefore, nutrients (phosphorus and nitrate) have been assessed based only on the existing current numeric criteria, which for total phosphorus is limited to FW2 lakes and streams, and for nitrates, which is limited to human health criteria related to drinking water supplies.

Computations Using Censored Data

13. **Comment**: The Department describes how data values that are less than the minimum reporting limit are to be used. Such data even when they represent a large percentage of the total data set can be used in water quality assessment. The USEPA has developed a suite of tools that enable the use of censored data. One such tool is ProUCL, Statistical Software for Environmental Application for Data Sets With and Without Non-detect Observations. These tools might allow more rigorous use of non-detect data than assignment of a value of one-half of the reporting limit and eliminating data based on whether the reporting limit is above or below the criterion and/or whether the data set is greater than 50 percent non-detect measurements. (3)

Response: The Department appreciates the commenter's suggestion for statistical tools. The Department has been using various statistical analysis packages to analyze and evaluate the data when it is necessary. The aforementioned ProUCL software is one of the packages the Department uses. The procedures that the Department follows during the assessment process:

1. When the criterion is based on the single sample value:
(a) If the criterion is greater than the reporting limit, data less than the reporting limit would imply the attainment of the criterion;
(b) If the criterion is less than the reporting limit, that data should not be used in assessment due to lack of accuracy.
2. When the criterion is based on assessing the geometric means, such as with a pathogen, a geometric mean calculated by assigning a concentration equal to the reporting limit to the non-detect observations will be the upper bound estimate given that the actual value of the non-detectable sample is somewhere between 0 and the reporting limit. Comparing that geometric mean to the criterion will be a conservative way to evaluate the compliance of the standard.

Use of Modeling Data

14. **Comment**: While modeling data can be very useful for water quality management purposes, modeling data should not be used to replace actual sampling data. Page 27 of the Methods Document states, "The Department may use the results obtained through a validated water quality or dynamic model to assess use support and/or place or remove an assessment unit/pollutant combination from the 303d List." Compliance with the SWQS criteria must be based on actual sampling data. However, if modeling data is the only option available, then it must be used only as a protective measure for an assessment unit and not for a delisting decision. (2)

    Response: Water quality models are generally used to simulate critical conditions, which are very difficult to monitor in real time. In addition, calibrated and validated water quality models may have the ability to predict water quality outcomes over various scenarios over various time periods, whereas, actual sampling data depicts only a static set of conditions at one point in time. Therefore, calibrated/validated water quality models may actually provide a better assessment of overall water quality conditions than actual sampling data, and modeling results may be used by the Department to support listing and delisting decisions. The Department has added listings based on modeling i.e. NY/NJ Harbor for many toxic/metals and in the Delaware River for VOCs. However, since actual data shows current water quality conditions, models alone do not trump sampling data; unless no data is available and then a validated model may be used to list/delist.

Inclusion of PBDE Contamination Levels

15. **Comment**: The fish consumption use assessments must include polybrominated diphenyl ethers (PBDEs), flame retardants that persist and bioaccumulate similarly to polychlorinated biphenyls (PCBs). The National Oceanic and Atmospheric Administration (NOAA) released a report in 2009 that identified the Hudson Raritan Estuary as containing the highest levels of PBDEs in the U.S. The report also indicates high levels at Long Branch and Shark River stations. NOAA has stated that flame retardants are a major concern to coastal ecosystems and that "*Laboratory studies indicate that PBDEs may impair liver, thyroid, and neurobehavioral development*." PBDEs were also detected in all fish tissue samples from 18 different species from the Delaware River Basin and Estuary. The Department must work with the NJ Department of Health to include PBDEs for fish consumption advisories. (2)

16. **Comment**: The Department must account for PBDE contamination levels in shellfish for assessing shellfish harvest for consumption uses. The National Shellfish Sanitation Program (NSSP) 2007 Section 2 Chapter 2 Presence of Toxic Substances in Shellfish Meats requires that "Upon determination that

toxic substances, including heavy metals, chlorinated hydrocarbons, and natural toxins are present in levels of public health significance in shellfish meats, the Authority shall investigate the harvesting, distribution, and processing of shellfish and take necessary corrective action." NOAA's mussel watch data detected moderate to high PBDE levels at all New Jersey stations. (2)

Response: In response to comments 15 and 16, risk assessments for fish consumption advisories have been developed for polybrominated diphenyl ethers (PBDE) and used in other states.

As the commenter points out, the National Shellfish Sanitation Program is responsible for investigating toxic substances in shellfish meats. The State of New Jersey issues advisories for recreationally caught fish and crabs but not for commercial activities. The interagency Toxics in Biota Committee, which develops fish advisories for the state of New Jersey, has not issued any consumption advisories for clams, mussels or oysters.

In other states, risk assessments for fish consumption advisories have been developed for PBDE and implemented. No advisories or threshold values for fish tissue have been developed in New Jersey because in the limited sampling that has been done by the State, elevated levels have not been detected in fish tissue. New Jersey is currently screening for PBDE as part of the Routine Monitoring of Toxics in Fish. It includes analysis of PBDE in a limited number of samples of fish from the coastal and some fresh waters of the State as well as the Delaware River/estuary. Those fish are currently being collected and the data should be available soon. Final reports will be available on the web at http://www.nj.gov/dep/dsr/fishadvisories/publications.htm.

In addition data for the Delaware Estuary were evaluated and presented in 2007 by the Delaware Department of Natural Resources and Environmental Control at the USEPA National Fish Forum http://water.epa.gov/scitech/swguidance/fishshellfish/techguidance/upload/2007_10_04_fish_forum_2007_section2b.pdf. As part of the study, cancer and non-cancer risk from fish consumption were evaluated and found to be low. Those samples with detectable levels of PBDEs typically contained other contaminants (i.e., PCBs) at levels elevated enough to warrant consumption advisories, therefore advisories are already in place that will, if followed, protect the public from PBDE.

Sample Size/Data Requirements/Rotating Basin Approach

17. **Comment**: While we applaud the Department for raising the target sample size for conventional parameters to 20 over 2 years, we feel that this will be a difficult goal to reach in many Assessment Units (AUs) in Barnegat Bay. Will the Department plan for and be able to meet this standard for the primary region in each assessment? We are concerned that without a significant investment of time and resources the default will be to use the minimum number of samples allowed and each AU will not be thoroughly assessed. (1)
18. **Comment**: Considering the Department is inadequately restoring Barnegat Bay it is illogical to consider their proposed rotating, regional, 10-year intensive study of water quality in NJ. This cycle will not provide adequate protection since the southern portions of Barnegat Bay are already showing signs of decline where they haven't before. (4)

19. **Comment**: Although we support increased data collection for better assessment, we are concerned about the combined implications of the Regional Comprehensive Assessment and the increased sample size requirement. The new regional focus on "Comprehensive Water Resource Management" allows an 'in depth' analysis of one-fifth of the state's waters every two years, with less intensive assessment being done in the other four water regions. The Department states its continued commitment to assess support for Shellfish Harvest for Consumption Use and Beach Closure information during each of the five Regional Comprehensive Assessment cycles. In another section of the document, however, it is proposed that 20 samples must be collected over two years at a station to enable determinations about assessment unit impairments. We are concerned that in any given cycle, the non-targeted water regions may not have enough data points to support necessary changes in use attainment. Under this condition, the listings from the previous Integrated Assessment Cycle would stand. In this way, it might be a full 10 years until a region becomes targeted again, before a listing or delisting would occur for a particular water body. (2)
20. **Comment**: If fewer than the minimum number of samples is collected, the Methods Document proposes allowing changes in status where "overwhelming evidence" is present. The Department should make it clear that delisting water bodies will not occur based on sample sizes that do not meet the minimum thresholds set in the Methods Document. Furthermore, the Department should strive to collect the minimum number of samples needed for assessment in all regions during all Regional Comprehensive Assessment cycles, to eliminate the possibility of assessments not being made in a timely manner due to insufficient data. (2)
21. **Comment**: With the Department's newly proposed minimum sample size of 20 samples collected over an at least 2 year period, could you please clarify whether:
    - The Department will only delist when the new minimum sample size is met;
    - Does this change the previous determination that only 2 exceedances of the criteria would be required in order to list as impaired? (5)

Response to comments 17 to 21: The Department strives to balance the objective to assess all waters and the objective to maximize confidence in the assessment decision, given the finite resources available for measuring water quality. Assessment decisions guide the Department's efforts to restore water quality, so it is important that they are accurate. For this cycle, the Department evaluated the latest guidance from EPA and the current practice in other states. The approach in this Methods Document applies greater rigor in assessing one water region to evaluate past assessment decisions and make new decisions based on a more robust data set, so as to increase the confidence in assessment decisions. This allows the Department to focus limited resources on developing and prioritizing management plans to improve water quality where a comprehensive assessment has documented- with a high level of confidence- that overall water quality is actually impaired.

To support the revised approach, the Department is currently reviewing its long-range monitoring strategy. It is expected that the revised approach will shift monitoring efforts within the networks, integrate monitoring networks to produce higher quality, robust datasets, and enhance work with stakeholders to assist in collecting water quality data, patterned after the partnership model employed to effectuate the Barnegat Bay Action Plan.

Under the regional assessment paradigm, the Department will consider listing or delisting in the regional target area if the new target sample size of 20 (for conventional parameters) is not met, provided there are other lines of evidence to make a decision. For the other regions, new/revised assessment decisions will be made if the target sample size is met, or if there is a compelling reason on a case-by-case basis for a specific, geographically limited area. Section 4.1 Frequency and Magnitude of Exceedance states, that the Department has determined that a minimum of two exceedances of a SWQS criterion are necessary to indicate possible noncompliance with the criteria. For datasets that meet or exceed the decision target sample size, the Department will consider the relative frequency and magnitude of the exceedances within the dataset and use available lines of evidence to determine non-support of the designated use." In no cases will a station be delisted if it does not meet the minimum sample size.

The Department, in partnership with other entities, has already invested significant time and resources in conducting an intensive monitoring and assessment of the Barnegat Bay Estuary. Based on this and other readily available data, the Department has conducted a comprehensive regional assessment of the Atlantic Coastal Water Region, which includes the Barnegat Bay, for the 2014 cycle. This will enable to Department to identify, with a very high level of confidence, which waters are impaired, as well as the pollutants causing impairment. The in-depth consideration of other factors will help identify the sources and causes of those pollutants/impairments. This comprehensive assessment will allow the Department to develop and target effective restoration strategies for the impaired waters. For example, the Department has already obligated Section 319(h) funding in 2013 and 2014 for the purpose of implementing approved watershed based restoration plans and TMDLs for impaired waters in the Barnegat Bay.

The shift toward a regional focus for in-depth assessment will not limit the assessment with respect to shellfish harvest and beaches. As explained in Section 2.0, the Shellfish Harvest for Consumption Use and Beach Closure information will be assessed for each listing cycle.

Temperature Criteria

22. **Comment**: The commenter is not entirely clear on why they cannot use the Pinelands temperature criteria currently in place. Is the Department basically admitting that they can't sample sufficiently to meet the standard, so they are switching to a simpler and less-stringent criterion? In light of the number of endemic fish to the Pinelands (of which trout is not), is using trout biology the best choice for criteria? We think not. Though most of the AUs in the Pinelands are non-trout, we are not convinced that 30°C (86°F) is a reasonable daily maximum for those waters. Higher temperatures mean lower DO in the water column. The endemic species to the pinelands (Banded Sunfish, Blackbanded Sunfish, Pirate Perch, Mud Sunfish, Swamp Darter and Yellow Bullhead) are generally sensitive to water quality, especially pH and including temperature. Most of the upper temperature ranges for all of these species are much lower (15-23°C) than the newly proposed standard (see references for each species account listed in www.fishbase.org). We would be concerned that the changes in the regulations are being used to relax land-use protections currently in place. These relaxed temperature standards would allow more disturbance in riparian/wetland areas and also would facilitate more degradation of water quality. (1)
23. **Comment**: Does the Department plan to adopt the temperature methods for Pinelands in its Water Quality Standards? (5)

Response to comments 22 and 23: Section 4.1 has been expanded to explain how all physical, chemical, and biological conditions are assessed for Pineland waters. As stated in Section 4.1, the Department is not changing its method for assessing criteria in Pinelands waters; rather, this section was added to explain the assessment methods that have been employed by the Department since the 1990's. The Department has used the corresponding FW2 criterion as a surrogate for criterion of PL waters when assessing the Aquatic Life, Trout, Recreation and Water Supply Designated Uses except for pH and nitrate, which have Pinelands specific numeric criteria, and the Pinelands Macroinvertebrate Index (PMI) used to assess biological conditions. Surrogate criteria are used because the 1984-1985 revision of NJDEP's SWQS (1984 proposal 16 NJR 3080(a), 1985 adoption 17 NJR 1270(a)) removed criteria for all parameters, except pH and nitrate, and identified the PL waters as Outstanding National Resource waters protected by the anti-degradation policies. The criteria in the Pinelands, except for pH and nitrate, are expressed as meeting existing conditions or quality necessary to attain or protect the designated uses, whichever is more stringent, and monitoring methods do not currently provide adequate information to determine the existing natural ambient levels in Pineland waterbodies. However, it was determined that FW2 criteria could be used as a surrogate for PL waters to verify if minimum standards are not supporting designated uses. Because these waters are an Outstanding National Resource Water, it was deemed necessary to incorporate other chemical and physical factors besides pH and nitrate to determine if designated uses were not being supported. This method does not constitute nor will it be promulgated as new surface water quality criteria. The Department will consider alternatives in the future including collecting continuous data over several years to cover a range of high and low flow conditions to determine existing conditions of these waterbodies for the purpose of assessment and implementation of the standard as it exists and/or development of numeric criteria in consultation with the Pinelands Commission.

<u>Barnegat Bay</u>

24. **Comment**: The commenter does not agree with the Department's view of the Bay as published in the "Barnegat Bay Interim Assessment" June 26, 2014. The Department has chosen to disregard the Rutgers project and results which concluded four years of intensive work and data covering essentially (2008 to 2012). This would suggest that the Department alone will determine the water quality process with bias and without oversight. (4)

Response: This comment is beyond the scope of the 2014 Methods Document, for which comments were requested, as it refers to an assessment conducted prior to developing the 2014 Methods Document. Nevertheless, the Department offers the following observations. The commenter is referring to a Rutgers study and resultant paper entitled, "Assessment of Nutrient Loading and Eutrophication in Barnegat Bay–Little Egg Harbor, NJ in Support of Nutrient Management Planning", by Kennish, Fertig, and Lathrop, 2012. The objective of this study was to develop a eutrophication index for Barnegat Bay. This study has been undergoing a peer review process and has not been accepted as final. Therefore, it would be premature to have considered this study as the basis for an assessment method in the 2014 Methods Document. The Department is currently engaged in an extensive study of Barnegat Bay, which has as one of its objectives, to define the numeric criteria or other translators of the narrative nutrient criteria that would be associated with support of healthy aquatic communities. This work will not be completed until 2015-2016, so is unavailable to inform assessment methods for the narrative nutrient criteria that apply to the bay in the 2014 assessment cycle.

As stated in the "Barnegat Bay Interim Assessment" June 26, 2014, any water quality data collected between January 1, 2008 and December 31, 2012 within the Barnegat Bay watershed were used in the

assessment, including data submitted by the stakeholders and data collected by the Department. Data used for the assessment process were downloaded from Water Quality Portal. Water quality data used in Rutgers projects that were collected within the specified time window was included in the assessment. The assessment was conducted based on the methods as described in the 2012 Integrated Water Quality Monitoring and Assessment Methods Document (Methods Document), found at: http://www.state.nj.us/dep/wms/bwqsa/2012_final_methods_doc_with_response_to_comments.pdf.

25. **Comment**: The Department has not met its obligation under the federal law to protect and restore Barnegat Bay and continues to use delay tactics. The Department has the legal and regulatory authority under CWA to restore Barnegat Bay. (4)

    Response: This comment relates to actions aimed at restoring water quality that is found to be impaired and is, therefore, beyond the scope of the 2014 Methods Document, which addresses the process used to determine if impairments are present. Nevertheless, it should be noted that the Department has been taking and continues to take actions to identity the problems that the Bay is facing and implement the appropriate measures to address the ecological health of the watershed. Governor Christie's Comprehensive Action Plan to Address the Ecological Decline of Barnegat Bay April 2014 outlines the specific progress the Department has made in collaboration with its partners to restore Barnegat Bay.

26. **Comment**: Barnegat Bay is impaired. The estuary is in a highly eutrophic state due to excessive nutrient loadings as documented by Rutgers University in the 2013 report, "Assessment of Nutrient Loading and Eutrophication in Barnegat Bay-Little Egg Harbor, NJ in Support of Nutrient Management Planning," prepared for the New England Interstate Water Pollution Control Commission (NEIWPCC) and published in Estuaries and Coasts; and in a 1999 report by the National Oceanic and Atmospheric Administration (NOAA), reconfirmed in 2007. The Department has the burden and authority under the Clean Water Act to make impairment decisions based on the available science, including data from academia and other non-Department sources. Based on these and many other documented sources since 1989, the Department should be compelled to act by declaring Barnegat Bay as impaired under the Clean Water Act. This would require the adoption of state water quality standards including a quantitative nutrient standard for marine waters and biennially assessing the extent to which waters provide for the protection of fish and shellfish, allow for recreation and meet other uses. The state's monitoring should be aligned with the state's standards for assessment. (4)
27. **Comment**: The Department's Methods Document which will be used to inform the 2014 Integrated Water Quality Monitoring and Assessment Report is flawed and not adequate to ensure swimmable, fishable waters in Barnegat Bay. Specifically, the commenter has significant concern with the way the Department monitors and assesses for nutrients in the Bay in that it is not only about monitoring nutrients in water samples of an estuary, which is essentially the total focus of the Department. The agency must also measure nutrients concurrently in the sediments, and ideally the tissues of seagrasses and algae as well.

    In fact, to get the total nutrient picture: water, sediments, and biota must be monitored. At any one time the concentration of nutrients in bottom sediments in Barnegat Bay can be much greater than in the water column itself. These nutrients are dynamic in that there is a constant flux of nitrogen

and phosphorous from the bottom sediments to the water column. This is apparent in summer when the decomposition of algae and seagrass in the sediment are then recycled into the water column. By not monitoring sediment nutrients, the Department misses more than half the picture. For example, half the nutrients taken up by seagrass roots derives directly from the sediments and not the water column at all. Nutrients released from the sediments can be taken up by the benthic algae resulting in blooms before the nutrients even reach the surface waters where they would be sampled by the proposed water sampling protocols.

A lot of the nutrient concentrations in the system would be entirely missed by water sampling alone, some of which would be responsible for macro-algal other bloom events. Thus, the monitoring proposed and conducted in the Methods Document are not adequate to accurately characterize the nutrient status in the Barnegat Bay estuary, a situation absolutely necessary to determine the causes of biotic impacts and ecosystem condition in the estuary. (See Rutgers et al, attached.) (4)

Response to comments 26 and 27: The Methods Document is not the means to establish new criteria, standards or restoration strategies, rather, it sets forth methods to assess data relative to the standards that have been duly adopted and approved by EPA. As described by the Department in its Comprehensive Action Plan to Address the Ecological Decline of Barnegat Bay 2014 Update, work is currently underway to develop numeric nutrient criteria or other translators of the narrative nutrient criteria, which will include studies of various trophic levels of aquatic communities to help identify nutrient thresholds that would support healthy communities and dynamic models of the fate and transport of nutrients in the estuary which will inform the next steps in identifying additional management responses to restore the bay. Until such work is complete, the Department will assess water quality in the Bay based on adopted, applicable water quality criteria and assessment methods for estuarine waters.

<u>Barnegat Bay Assessment Units</u>

28. **Comment**: The commenter agrees with the Department's decision to use hydrographic data to realign the AU boundaries within Barnegat Bay, but notes that AUs 2 and 4 (the Metedeconk and Toms Rivers, respectively) contain a substantial amount of watershed area, and likely tributaries that were previously part of other HUC14s. The commenter requests that the Department explain why those particular AUs were expanded into the watershed while the other realigned AUs were not. (1)
29. **Comment**: The commenter requests that the Department provide the rationale for changes made to Assessment Units in the Barnegat Bay. The previous 11 HUC14 Assessment Units in Barnegat Bay have been revised down to 9 Assessment Units based on evaluation of intensive data from the Bay. Since HUC14 boundaries are watershed-based, the commenter would like the Department to provide the scientific basis for re-delineating these assessment units. In particular, the Department should provide justification for the separation of the central bay into two vertical segments (Assessment Units 5 and 6, Figure 5.0, page 25), which seems questionable without insight into factors such as watershed loading and bay circulation patterns. (2)
30. **Comment:** The HUC 14 model is the basis for all education, outreach, public policy, data collection and existing municipal watershed plans used by and for the partners involved in protecting and restoring the Barnegat Bay for over 40 years. The Barnegat Bay is a singular body of water and as such, all of its portions, including Manahawkin Bay and Little Egg Harbor Bay should be protected

as a C1 waterway. The idea that an *imaginary* line can be drawn down the middle of the Bay as a way to monitor or assess water quality based on a dependent use is not acceptable. The people who use the Bay do not recognize these *imaginary* lines or differentiate between their uses. (4)

31. **Comment:** The anti-degradation policy is defined in part, as applied "in tandem with the classification of the receiving water body in making decisions about proposed new or expanded discharges to surface waters, as well as certain land use permits." The new proposed "Bay Assessment Units," which segment the Bay, do not follow the land-use link to the receiving water body model and obfuscate the existing data. It will also serve to limit the ability of public officials to control imprudent development on the land as it directly correlates to water quality. (4)

Response to comments 28 to 31: New Jersey's assessment units utilized for the Integrated Water Quality and Assessment Report have been changed over time. Beginning in 2006 NJDEP utilized 14-digit Hydrologic Unit Code (HUC) subwatershed boundaries as the assessment unit (AU) boundaries statewide. This shift towards a subwatershed assessment works well in areas that are land and tributary based. In open waters such as Barnegat Bay, HUC 14 delineations are straight line extensions of land-based HUC boundaries, and lack any hydrologic context in the absence of drainage features, such as those present on land. The work that was completed under Action Item 7 of the Governor's Barnegat Bay Action Plan provided new detailed chemical and hydrologic data for Barnegat Bay. The intensive water quality network for the Bay as well as the development of the hydrodynamic model based on the collections of flows throughout the Bay provided the robust data set, that allowed the Department to evaluate the meaningfulness of existing AU's and delineate new AU's that are reflective of the conditions in Barnegat Bay. The new Barnegat Bay AU's were developed after evaluating the hydrological, chemical and biological features of the Bay as they related to water quality measured in the bay. The delineation process was done in coordination with USGS and included the analysis of the chemical data combined with information from the initial hydrodynamic model. In some cases, such as Assessment Units 2 and 4, the water chemistry and/or hydrology identified portions of larger tributaries that are more reflective of Bay water quality and flow than tributary characteristics. Evaluation of water chemistry and hydrodynamic modeling output identified these large open water sections of the tributaries as intricately linked to Barnegat Bay proper. Similarly, these data provided information about in Bay circulation patterns that enable the Department to consider these patterns when delineating the in-bay assessment units. Because the assessment unit delineations did not change the official HUC14 boundaries, there is no effect on any C1 designations, as they remain linked to the HUC 14 boundaries.

<u>Application of Narrative Nutrient Criteria</u>

32. **Comment:** The proposed method for assessing nutrient impacts continues to ignore estuarine waters such as Barnegat Bay, despite a legal imperative to do so. The Department maintains that this is because appropriate estuarine and marine translators for nutrient narrative criteria are still under development. It is unacceptable to not explain the status of nutrient criteria assessment for all waterways of the state. The document must list a timeframe for the assessment of estuarine waters using the narrative nutrient criteria. The amount of time that has elapsed while planning to assess the nutrient impairment of Barnegat Bay and similar waters is increasingly frustrating, especially given that nitrogen is a listed pollutant in estuarine waters. Undoubtedly, these waterways will only continue to degrade as we wait for more studies to be completed and translators to be developed. A September 2013 memorandum to states from the US EPA describes methods that other states have used to assess nutrient-impaired waters with

narrative criteria, including the use of simple visual assessments. These simpler methods could require action to halt nutrient-based declines now, while more robust indicators are being developed. (2)

33. **Comment:** It appears that the Department has only proposed narrative translators for waterbodies that currently have numeric nutrient criteria (freshwater, wadeable streams). Does the Department plan to propose narrative translators in their methods that would address other waterbody types for nutrients? (5)

    Response to comments 32 and 33: The role of the Methods Document is to denote the current methods to be used by the Department to assess its waters for a specific assessment cycle relative to adopted and EPA-approved surface water quality standards. Setting timeframes and projections concerning future assessment methods are outside the scope of this document. Nevertheless, it should be noted that the Department is moving to develop nutrient criteria, translators and assessment methods as quickly as possible. The Department's plan for doing so is set forth in the 2013 edition of the New Jersey Nutrient Criteria Enhancement Plan on the Department's web site at http://www.state.nj.us/dep/wms/bwqsa/nutrient_criteria.htm. The Plan outlines the current status and time frames of issues delineated in the comment.

34. **Comment**: The Methods Document states that "Nutrients: The SWQS include narrative nutrient criteria that apply to all freshwaters of the State, in addition to the applicable numeric criteria for phosphorus." Recently adopted narrative criterion for nutrients is applicable to all classifications of waters of the state and not only freshwaters. Corrections should be made to reflect this revision. (5)

    Response: The Department agrees with the commenter and will update the Methods Document to reflect this fact. Section 4.4 in the Methods Document from where the commenter quoted from only pertained to fresh waters and has been removed from the final version of the Methods Document.

35. **Comment**: The Methods Document also illustrates the Department's continued failure to adopt quantitative criteria for nutrient pollution in New Jersey's coastal waters as a part of the Surface Water Quality Criteria. Nutrients are an obvious pollutant in the marine environment for which the Department has an obligation to manage and list as a pollutant, whether or not they exceed the limit enough to be considered impairment. Since no quantitative standard exists, no water quality data can be assessed for compliance to determine impairment and designated use support.

    In the Department's Nutrient Criteria Enhancement Plan that the Environmental Protection Agency (EPA) approved, it was recognized that the "federal government (USEPA and NOAA) has already developed a suite of indicators (e.g., EPA's National Coastal Assessment Report 2005 and NOAA's National Estuarine Eutrophication Assessment update) and applied them to New Jersey's coastal bays." The Nutrient Criteria Enhancement Plan was written by the Department. All of the problems associated with its standards, monitoring, and water quality assessment are the responsibility of the Department. The limited action the Department has taken for nutrient pollution has been to establish a narrative standard, which relies almost exclusively on dissolved oxygen. Although the threshold for the narrative standard has been arguably met by much of the conditions throughout the Bay, Save Barnegat Bay and likely, Rutgers would contend that dissolved oxygen should not be the only

indicator of eutrophic conditions. Furthermore, other states have declared impairments based on narrative standards alone. (4)

Response: The commenter is correct in that an estuarine benthic bioassessment method employed by the National Coastal Assessment (NCC) has been available to assess New Jersey estuarine waters. However, a stakeholder review of the NCC metric, "Virginia Province Benthic Index," as part of the Barnegat Bay Science and Technical Advisory Committee noted a concern that the index represented a broad geographic scale which may not be adequate to assess New Jersey specific waters. To address this, Rutgers University undertook an assessment of the Bay employing a suite of peer reviewed benthic bioassessment methods, some fine-tuned to Barnegat Bay fauna. Current results can be viewed at http://nj.gov/dep/dsr/barnegat/finalreport-year1/#one. A second year of study has been completed and is under review and a third year of study is currently underway. Once complete, results of this work will be considered, along with other studies of Barnegat Bay aimed at developing numeric nutrient criteria or translators, for use in the future as assessment methods.

Ocean and Estuarine Benthic Testing and Indicators

36. Comment: The commenter supports ocean benthic testing for the 2014 report. In addition to the benthic community index under development, benthic indicators of aquatic life use must include assessment of contaminants in sediments and that have bioaccumulated in infauna and epifauna benthic biota. (2)

Response: The benthic indicators employed in both estuarine and near shore waters represent state of the art bioassessment methods employed in both Europe and North America. The Department is unclear as to the rational for collecting bioaccumulation data on benthic invertebrate fauna beyond species commercially harvested. With respect to these low trophic level organisms, the Department lacks body burden thresholds necessary to trigger a "designated use impairment". In addition, the body burdens here may be at undetectable levels whereas fin fish taken for human consumption usually occupy much higher trophic levels, where compounds can concentrated to detectable levels through bio-magnification. The Department does collect these data in finfish and shellfish directly and in turn issues consumption advisories and assesses the designated use from the perspective of human health.

37. Comment: The Department must ensure that benthic indicators are finalized and have a solid scientific basis as soon as possible. The final 2012 Methods Document stated that, "The Department, USEPA AED, USEPA Region 2, and Rutgers University are working together to develop a benthic index to evaluate aquatic life use in the nearshore New Jersey ocean waters. The Department received a draft of the final report in March. This index is expected to be finalized later in 2012. Since this index is not yet final it was not included in the 2012 Methods Document. We expect to include the new index in the 2014 Methods Document." Given that the index for ocean waters was not provided in the draft 2014 Methods Document, the Department must provide an explanation for this delay and a timeframe for its completion. (2)

Response: The Department has not yet completed its review of the metric; hence it is not available for 2014 assessment.

38. Comment: Benthic indicators are also necessary for assessing aquatic life use in estuarine waters, and must be developed for all state estuaries**.** Some progress has been made in the development of a Biotic Index of Integrity for the New York/New Jersey Harbor Estuary; however, this index is applicable to a

very small geographic area and is based on antiquated EPA data (collected in 1993 and 1994). As such, the Department should continue to collect and interpret data from the New York/New Jersey Harbor Estuary area as part of its comprehensive assessment of benthic indicators in an effort to modernize this index while simultaneously developing the index for the remainder of the state's estuarine waters. (2)

Response: New data for the Harbor Estuary benthic index was collected in 2013 which is outside the data window employed in the 2014 assessment (2008 – 2012). These data will be used for the 2016 assessment cycle.

39. Comment: The commenter states that once the proposed benthic community indices for ocean and estuarine waters are complete, they look forward to the public comment period that is required before the indices can be adopted. We suggest that they include both infauna and epifauna or include two sub-indices for these communities. Habitat types or other ecological drivers that might impact benthic community results need to be assessed. The indices need to be unbiased, feasible, based on ecological principles, and adequately sensitive to impacts on benthic communities. (2)

Response: The benthic bio metrics for New Jersey coastal waters are being developed based upon current peer reviewed methods employed both in Europe and North America and are considered state of the art. Once a metric is deemed validated by the Department and ready for use, it is posted on the Department's website along with all supporting technical documentation thereby allowing public review of the metric. As well, the Methods Document that would use such a metric also undergoes public review. These actions are not rulemaking, however. The Department is unclear what statute the commenter is referring to in a required "public comment period" denoted in the comment.

40. Comment: Benthic sampling and contaminant testing should occur as soon as possible whether benthic community indices are fully developed in time or not, and the benthic community data should be analyzed when the indices become available. This is important for comparative testing and assessment of the benthos over time. (2)

Response: The Department has been collecting benthic biological data in Barnegat Bay and the nearshore ocean and reviewing the results on an ongoing basis. The results will be finalized and made public once the scientific community has been allowed to peer review the methods as they are applied to New Jersey specific waters.

<u>Need for Additional Parameters in Assessment Methods for Designated Uses</u>
<u>Aquatic Life Use Assessment Method</u>

41. Comment: The biological assessment element of the draft Aquatic Life Use Assessment Method as written does not explicitly define types of biological monitoring data to be incorporated into this use assessment, as only benthic macroinvertebrate and fin fish data are discussed. Nor is there any imperative for incorporation of all available data, such as data on seagrass and shellfish declines in Barnegat Bay. (2)

Response: Section 6.1 states that benthic macroinvertebrate and fin fish IBI data are the only biological data currently used in aquatic life use assessments. This language does fail to mention that currently these indicators apply only to *freshwater non tidal waters and the New York-New Jersey Harbor and estuary*. This language will be corrected in the Methods Document. Other types of biological data will

be used in the future in coastal waters when they have been fully vetted and accepted for assessment purposes. Such data require scientifically-supported thresholds defining when these communities do and do not represent impaired conditions. Work on these indices is continuing to be refined.

Shellfish Harvest for Consumption Use Method

42. Comment: The Department has historically used this method and designated use only to measure the safety of consuming what shellfish a person can find in a water body. Where water quality changes and other stressors have substantially reduced the abundance of shellfish to be harvested, this use is impaired. This section should be amended to include a distinct measure of impairment based on quantitative reduction in shellfish populations. (2)

Response: The purpose of the Methods Document is to explain the scientific methods employed by the Department to assess designated uses of New Jersey's waters based on compliance with established surface water quality standards pursuant to the federal Clean Water Act. Therefore, the method for assessing the shellfish harvest for consumption use is based on an assessment of water quality impacts that could or have impaired that use. While there other stressors that could adversely impact the overall health of shellfish populations from an ecological perspective, there are no approved metrics to make such an assessment at this time.

Industrial and Agricultural Designated Uses

43. Commenter: The commenter commends the Department for its decision to hold industrial and agricultural designated uses to more conservative drinking water standards. (2)

Response: The Department acknowledges the commenter's support.

Drinking Water Supply Use Assessment

44. Comment: The introductory paragraph of Chapter 6.5 states "All FW2 and PL waters are designated as drinking water supply use**.** It is important to note that many waterbodies do not have drinking water intakes due to stream size and other considerations."(Emphasis added). No further mention is made of how the drinking water (DW) use assessment will be made for these waters. Considerable stakeholder discussion and proposals have been put forth recently to address this issue. Acknowledgement of consideration of Tiered Drinking Water Use, for example, should be included. To be consistent, a Drinking Water Supply Use assessment might not be needed or might be of a different form when the use is not present. (3)

Response: The paragraph cited by the commenter states: "The drinking water supply use is assessed primarily by comparing concentrations of associated chemical parameters (see Appendix A) to the applicable SWQS criteria. Nitrate is the only parameter for which there must be data to assess the drinking water supply use; however, other parameters (for example, arsenic, cadmium, chromium, copper, cyanide, lead, mercury, thallium, zinc, chloride, radioactivity, and volatile organic compounds) will also be used to assess the drinking water supply use when sufficient data for these parameters is available." Additional considerations for this use assessment, as well as a table of outcomes and use assessment results, are also provided in this section. The concept of tiered-drinking water uses relates to the level of treatment for nitrate that would be required from wastewater discharge facilities through New Jersey Pollution Discharge Elimination System permits, depending on a number of factors related to the potential to affect a drinking water source. This concept is being considered by the Department as

something that may be implemented in the future through the New Jersey Pollution Discharge Elimination System discharge permitting program, but is not currently reflected in adopted rules. It should be noted that the tiered drinking water approach is an implementation strategy only, and does not change the SWQS for nitrate nor the assessment of impairment relative to the SWQS. Foregoing a drinking water use assessment would only be appropriate if that use were to be removed from the water. There is no current plan to remove the drinking water use from any waters.

Exemptions

45. Comment: The definition of "transient events" must be more explicit (page 14). The document states that transient events "occur at very low frequencies over very brief timeframes and, as such, neither impair the designated use of the water body nor represent overall water quality conditions." This exemption does not qualify which parameters such an exemption may apply to. Could it apply to pathogen levels at beaches? If and when a "transient event" is the justification used to not list an impairment, this decision needs to be explained and supported in the integrated report. (2)

Response: Transient events are qualified based on available supporting information, such as notes taken during the sampling event, precipitation record, known events such as sanitary pipe breaks, frequency of excursion, duration of excursion etc. All parameters are subject to being qualified for transient events including pathogens. In case of pathogens, the beach closure captures the transient events since every exceedance is followed by a next day sampling at the station where excursion occurred and the bracket stations. All justifications used not to list an impairment are documented in Integrated Report as "Decisions to Not List Assessment Unit/Pollutant Combinations on the 303(d) List of Water Quality Limited Waters".

Sublist 5 Subparts
Natural Water Quality and Restoration

46. Comment: The Department is reiterating the SWQS at N.J.A.C. 7:9B-1.5 (c), "Natural water quality shall be used in place of the promulgated water quality criteria of N.J.A.C. 7.9B-1.14 for all water quality characteristics that do not meet the promulgated water quality criteria as a result of natural causes." That approach and its application to parameters (including but not limited to arsenic) that are present in surface waters due to naturally occurring geology and soil are supported. (3)

47. Comment: A new Subpart A List under Sublist 5 (Impaired Waters List) is being proposed for arsenic. The basis of assessment under this Subpart List A is the fact that arsenic levels are known to exist that are higher than the human health SWQS but that is due to natural causes. The explanation paragraph cites USGS studies that determine arsenic levels that were "expected to represent natural conditions based on geology, monitoring of ground water in aquifers, surface water and soil samples". It is noted that arsenic levels defined to date are still very low compared to Drinking Water Standards. Incorporation by reference of the drinking water standard into the SWQS is recommended for the human health arsenic SWQS. As drinking water treatment advances allowing a lowering of the arsenic drinking water standard, the SWQS would be reduced concurrently. An alternative approach could be the consideration of the arsenic in drinking water that makes up influent water quality at water resource recovery plants. (3)

Response to comments 46 and 47: The Department acknowledges the commenter's support of placing arsenic on Sublist 5A. It should be noted that USEPA does not support an assessment of waters as "fully supporting" the Public Water Supply use unless documentation is provided that shows the human health criterion associated with that use has been met. In New Jersey, the human health criterion for arsenic is 0.017 ug/L (total recoverable). Therefore, levels that are believed to occur naturally exceed the human health criteria must be deemed impaired with respect to that use. Natural levels are only allowed to supersede the human health criteria if the drinking water use is removed. Because the New Jersey MCL for arsenic under the Safe Drinking Water Act is 5 ug/L (the federal drinking water standard is 10 ug/L), waters above natural levels and the human health criteria conform to the Safe Drinking Water requirements.

The placement of arsenic on separate Sublist 5A will be done only in areas where the USGS studies identified levels that can be attributed to natural conditions due in most part to NJ's unique geology. Because of the limitations on the use of natural conditions, such waters are still impaired, but placement on 5A reflects the fact that development of a TMDL would serve no purpose and will not be done.

48. **Comment**: Splitting out arsenic (Sublist 5A) and legacy pollutants (Sublist 5L) may be reasonable for much of the State. However, Sublist 5R, for watershed based plans, would weaken the Department's existing regulatory protections of water quality. While addressing pollutant loadings through a holistic, watershed approach is commendable, the Department would be placing too much reliance on watershed plans to reduce pollutant loads. (1)
49. **Comment**: The commenter recognizes that TMDL development is a lengthy and complicated process, but has concerns regarding the Department's recommendation of the implementation of a watershed based plan (WBP) as an alternative to a TMDL in waterbodies where impairment can be attributed to nonpoint or regulated stormwater sources (Sublist 5R). The TMDL is a regulatory process, as opposed to the voluntary nature of a WBP. Though WBPs have many similar components, including load reduction calculations, it is not clear how the success of WBPs will be monitored and assessed. The Methods Document does not describe what accountability and enforcement measures will be built in to the development and implementation of WBPs to ensure that they are making appropriate reductions in pollutant load relative to impairment. It does not specify which pollutants are eligible for this option, or what timeframe is acceptable for the successful implementation of a WBP. Further, in future integrated assessments, how will assessment units be prioritized for funding to create and implement WBPs instead of TMDLs? It is not clear what course of action will be required for impaired waterways not funded to create WBPs. (2)

Response to comments 48 and 49: The Department believes that for impaired waters where sources of pollutant loads are from nonpoint sources and regulated stormwater (technically a point source), the most effective responses are source control through best practices. Best practices have already been applied through MS4 regulation and the fertilizer law, while others are non-regulatory in nature.

Similar to a TMDL, an approved watershed-based plan must identify the source of the pollutant, the relative contribution and the load reduction needed to attain SWQS. A description of the 9 minimum elements required in an approved watershed based plan may be found at http://www.epa.gov/region9/water/nonpoint/9elements-WtrshdPlan-EpaHndbk.pdf. Watershed based plans employ an adaptive management approach in which available information and analytical tools are

used to support the best planning decisions that can be made ensuring restoration and stewardship of impaired waters. The implementation specification found in watershed based plans is more detailed than in a TMDL document and is eligible for Section 319(h) funding. Further, there is a mechanism by which a watershed based plan could inform the need for enhanced regulatory requirements under the MS4 permitting. Therefore, there is no loss of implementation authority using the tool of a watershed based plan over a TMDL, in the intended circumstances.

Finally, the placement of an AU on sublist 5R does not remove the Department's obligation to prepare a TMDL if the waterbody does not attain designated uses in a reasonable amount of time. Moreover, the placement on sublist 5R is a tool to assist the Department and the public to recognize that the solution to address non-regulated nonpoint sources may be better served through an approved WBP and eligible for 319 funding to implement measures to address source control of the impairing parameter.

50. Comment: The commenter states that there are very few watersheds that have approved plans, and would therefore be eligible for 319(h) or Farm Bill funding. Those funding programs have been deeply cut in recent years; also, funds for plans have generally had a lower priority. We are concerned that the proposed sublist takes the responsibility to reduce pollutants out of the regulatory arena and places it into a voluntary program. This change will result in less regulatory oversight/protections. Lastly, funding support for current voluntary programs (*e.g.*, Section 319[h]) are nowhere near the magnitude needed for consistent, significant water quality improvements. (1)

51. Comment: The Methods Document contains no quantitative analysis of current pollutant loads or load reductions that could be achieved by implementing targeted management practices like TMDLs. There is no alternative efficient effective response to the need for comprehensive watershed plans that address impaired and threatened coastal waters. The reliance on EPA's section 319(h) funding to address NPS pollution is a non-regulatory and voluntary approach which introduces significant uncertainty in how and when projects will be implemented. There is no guarantee that waterways will be cleaned up or reach the desired water quality to support uses. Save Barnegat Bay supports the use of TMDLs as the quantitative approach to reducing nutrient loading in Barnegat Bay. (4)

Response to comments 50 and 51: Both comments are beyond the scope of the Methods Document. The Methods Document is not intended to provide a quantitative analysis of current pollutant loads or load reductions that could be achieved by implementing targeted management practices like TMDLs or NPS pollution control strategies. However, by providing sound scientific methods for assessing water quality throughout the State, the Methods Document will enable the Department to identify, with a high level of confidence, waters that are in need of restoration so that other programs and funding sources can be directed to such efforts. Further, the Methods Document does not establish funding priorities, rather, it identifies impairments that inform grant programs, within which funding priorities must be set.